



TURKISH ASSOCIATION OF ORAL
AND MAXILLOFACIAL SURGERY



**TURKISH ASSOCIATION OF ORAL AND
MAXILLOFACIAL SURGERY**
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TAOMS '25



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KAYA PALAZZO HOTELS & RESORTS
Antalya, Türkiye

PROCEEDING BOOK

**7th YOUNG
TAOMS
SYMPOSIUM**

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YOUNG TAOMS SPEAKERS

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INTERNATIONAL SPEAKERS

Amir Elbarbary

CV

Amir Elbarbary, MD

Professor of Plastic Surgery & Head of CMF Unit -Ain Shams University, Cairo-EGYPT

Consultant Aesthetic & Craniofacial Surgeon

Former, postgraduate program director

Craniofacial Fellowship, UCLA

Chair, IB AO CMF

Founding member & General Secretary, EG-CMF

Member, ESPRS

Int. Member, ASPS

Int. Member, ASMS

Member, ISCFS

Member, ISAPS

Member, ICOPLAST

Member, CMTR Editor's review Panel

International Editor, FACE journal

Chingiz Rahimov

Abstract

Effectiveness of Virtual Planning and Navigation-assisted Surgery in Reconstruction of Oral Soft Tissues.

Background:

Connective tissue grafting (CTG) is the established gold standard for soft-tissue augmentation in oral surgery. However, conventional harvesting is performed without consistent visualization of palatal vasculature, exposing patients to risks of vascular injury, bleeding, donor-site morbidity, and delayed healing. These limitations highlight the urgent need for safer and more predictable approaches.

Objective:

To introduce and validate the first ultrasound-integrated surgical guide for CTG harvesting, incorporating vascular mapping and injection ports for precise local anesthesia, and to establish a foundation for future augmented reality (AR) translation.

Materials and Methods:

Preoperative ultrasound was used to determine palatal mucosal thickness and the course of the greater palatine artery. Based on these datasets, a digital surgical guide was designed and 3D-printed. The guide included a predefined harvesting window corresponding to a vascular-safe zone and, in the case of a half-guide design, one additional injection opening to ensure accurate anesthetic delivery to the palatal mucosa. Intraoperative use was assessed for graft precision, vascular safety, anesthesia accuracy, and donor site morbidity.

Results:

The ultrasound-integrated guide enabled accurate localization of vascular-safe zones and predictable harvesting of CTGs with predefined thickness. The incorporation of an injection port facilitated precise anesthetic delivery, improving intraoperative control and patient comfort. For the first time, surgical guides were generated directly from ultrasound data. This workflow improved predictability of graft integration, reduced complications, and minimized donor morbidity.

Conclusion:

This guide demonstrates improved safety, predictability, and patient-centered outcomes in CTG harvesting. By integrating harvesting and anesthesia guidance into a single ultrasound-based design, it establishes a new standard of care. Importantly, this workflow provides the foundation for AR integration, where incision pathways and injection sites may be projected directly into the surgical field.

Keywords: connective tissue graft, ultrasound navigation, surgical guide, vascular safety, augmented reality

Dilip Srinivasan

CV

Consultant, Nottingham University Hospitals NHS Trust

I have been in this post since 2010. The unit has 7 Oral & Maxillofacial consultants, 5 specialty doctors, 4 Specialist Registrars, 2 Clinical fellows and 9 Dental core trainees. The unit also has Orthodontic and Restorative dentistry services.

The unit provides the full range of Oral & Maxillofacial surgery to the people of Nottinghamshire except cranial synostosis surgery. It is a level-I trauma centre, regional cleft centre.

Clinical:

General Maxillofacial surgery

Facial deformity surgery

Member of skull base surgery providing access surgery

Paediatric maxillofacial surgery

Member of Nottingham sleep study centre providing surgery for OSA

Member of regional cleft surgery providing secondary cleft surgery

Provide intra and extra oral implant surgery for rehabilitation

Distraction osteogenesis surgery for facial deformity and reconstruction

Administrative:

Clinical Director Head and Neck Directorate since 2023

Head of service since 2012. Key achievements include

Amalgamation of the Maxillofacial services in Nottinghamshire to a single unit.

Expansion of Maxillofacial surgery by appointing four new Consultant posts and one Specialty doctor post

Expansion of Orthodontics by appointing one new Consultant

Integration of the Head and Neck oncology services between Lincolnshire and Nottinghamshire by creating and appointing to a joint consultant post

Amalgamation of the Maxillofacial on call services of Lincolnshire and Nottinghamshire

Introduction of an on-call system using second degree students

Educational:

Educational supervisor for Specialist Registrars since 2019

Clinical supervisor for Junior trainees

Clinical supervisor for second degree students

Abstract

Virtual planning for Orthognathic surgery

There has been a paradigm shift in orthognathic surgery in the last few years. From occlusion based planning we have moved to planning based on true movement of facial bones. This addresses facial aesthetics better, which is often the primary concern for patients. In house planning is feasible and affordable. In this presentation we will explore this and present the Nottingham experience.

Günel Aliyeva

CV

I graduated with honors from Azerbaijan Medical University and completed my internship in Oral and Maxillofacial Surgery in 2011. Since then, I have been working as an oral and maxillofacial surgeon. In 2022, I founded DISH.az, the first multidisciplinary dental team in Baku, Azerbaijan, uniting specialists in surgery, orthodontics, prosthodontics and periodontology.

I am currently a doctoral researcher (2024-2028) at the Department of Oral and Maxillofacial Surgery, Azerbaijan Medical University.

My clinical and research interests focus on digital navigation, 3D printing, ultrasound-guided palatal graft harvesting and soft-tissue reconstruction, with a strong emphasis on the integration of Industry 5.0 principles into surgical practice.

I am the author of "A Simplified Method for Determining the Height of Atrophied Ridge in Practical Dental Implantation," presented at EuroPerio 9.

I have also introduced a new suturing method — "Enhanced Suturing Technique for Preventing Complications in Mandibular Atrophy Surgery: A Two-Layer Approach," presented at EuroPerio 11.

In addition, I proposed a novel treatment protocol using surgical acceleration in orthodontics, which I presented at the International Conference on Oral and Maxillofacial Surgery (ICOMS), organized by IAOMS.

I have participated in major international congresses including ICOMS, EuroPerio, and ICMFS 2025 in Baku, where I was an oral presenter.

Abstract

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Manlio Galie

CV

Manlio Galiè is clinical Professor at the St. Anna University Hospital of Ferrara, Head of the Department of Cranio Maxillo Facial Surgery. He has completed formal training in both Medicine MD and Dentistry DMD. He specializes in Maxillo-Facial Surgery and in ENT Surgery. Dr. Galiè has lectured as invited speaker to numerous Seminars, Meetings, Roundtables and Congresses in Italy, Europe, and Worldwide. Author of over 70 publications in National and International Journals he is a Member of the Editorial Board of the Journal of Cranio-Maxillofacial Surgery (Official Pubblication of the European Association for Cranio-Maxillofacial Surgery – EACMFS), of the Journal of Craniomaxillofacial Trauma and Reconstruction (Official Membership Journal of AO CMF) and Se International Fellow at University of California, Los Angeles (UCLA), Craniofacial Center. Fellow of the European Board of Oro – Maxillo – Facial Surgery (FEBOMS) Honorary Fellow of the American Association of Oral and Maxillofacial Surgeons (FAAOMS) Past Education & Training Officer of the European Association for Cranio-Maxillo-Facial Surgery (EACMFS) 2014-2020 Past President of the European Association for Cranio-Maxillo-Facial Surgery (EA Member of the European Clinical Networks: EUROCRA and ORPHANET. Member of the following Associations: EACMFS (European Association for Cranio-Maxillofacial Surgery), SILPS (Society for Cleft Lip and Palate and Craniofacial Malformation Study and Treatment), SICMFS (Italian Soci Interested in new innovations in cranio-maxillo-facial surgery his special interests are in craniofacial surgery, orbital surgery, reconstructive surgery and total facial rehabilitation, orthognathic surgery, cleft surgery, tumor surg

Max Heiland

CV

Prof. Dr. med. dent. Max Heiland is a highly experienced oral and maxillofacial surgeon with a career spanning 26 years. He works at the Department of Oral and Maxillofacial Surgery at the University Hospital Charite Berlin. Dr. Heiland's impressive CV showcases his extensive education and qualifications. He completed his pre-clinical medical studies at the Johannes Gutenberg University in Mainz and clinical medical studies at the University of Hamburg. He went on to earn medical and dental doctorates, as well as a specialist title in oral and maxillofacial surgery. Additionally, he is a Fellow of the European Board of Oro-Maxillo-Facial Surgery. With over 400 scientific publications, Dr. Heiland is actively involved in research and advancing his field. His publications cover a wide range of topics, including using antibiotics in immunotherapy for head and neck carcinoma, the development of biomaterials for bone substitutes, and the application of deep learning algorithms in dental radiographs. Dr. Heiland's expertise and dedication to his profession make him a highly respected and sought-after oral and maxillofacial surgeon. He is known for his innovative approaches and contributions to the field. Patients can trust his vast knowledge and experience to deliver exceptional care and the best possible outcomes for their oral and maxillofacial surgical needs.

Paul Pöschl**CV**

Academic career

- 1998: Medical University of Vienna (MUW, Austria): Medical Doctor (MD)
- 2004: University of Regensburg (Germany), Dental School: Doctor of Dental Medicine (DMD)
- 1998–2006: Resident for OMFS (CMF) at the Medical University of Graz, (Austria) and the MUW
- 2006: Specialist for OMFS and senior consultant
- 2011: Assistant Professor for OMFS (CMF) at the MUW
- 2012: Habilitation (PhD, Professor) for OMFS (CMF) with a habilitation treatise about „maxillary squamous cell carcinoma“ at the MUW
- 2013: Head of the Department for OMFS at Klinikum Wels-Grieskirchen (Austria): Primarius

Teaching experience

- Lecturer for OMFS (CMF) at Medical School and Dental School of MUW
- Supervision of graduands for Dental Medicine at the MUW
- Teacher for the biannual training programs for emergency doctors at Klinikum WelsGrieskirchen

- Teacher in the curriculum for OTA („operationstechnische Assistenten“, surgical staff) at Klinikum Wels-Grieskirchen
- Lecturer in the Masterprogramm of MUW, Master in Clinical Dentistry – Periodontology and Implantology in 2021

- Lecturer at the Stryker CMF academy in 2021
- Lecturer at the Stryker Trauma hands-on course at he Amsterdam skill center in 2022
- Lecturer at the IAOMS/EACMFS NextGen online Conference about head and neck oncological surgery in 2023
- Lecturer at he EACMFS PG Programme Head and Neck Surgery: Oncology, hands-on workshop at the Anatomy of MUW in 2023
- Lecturer in the EACMFS PG Programme in Head and Neck Surgery: Oncology 2024 and 2025

Research

- Author of numerous scientific publications (31 PUBMED listed) and reviewer of many international peer-reviewed journals, e.g. JOMS, Head and Neck, CMTR

Other qualifications

- Co-founder and promoter of the interdisciplinary Board for Head and Neck tumors at the Comprehensive Cancer Center (CCC) of the MUW
- Member of the executive board of the Austrian Society for Oral and Maxillofacial Surgery (OEGMKG), member of EACMFS, AOCMF, DGZMK, OEGCH, IAOMS
- Private office with a special focus on implantology
- Promoter of the monthly OEGMKG webinar for OMFS residents
- Member of the ethics committee of Kepler University Linz, Austria

Abstract

Implantology Meets Reconstructive Surgery - Options and Limits After Major Head and Neck Oncological Procedures

The ultimate goal of maxillofacial reconstructive surgery after ablative procedures in the head and neck region due to malignant tumors is not only to enable a safe defect coverage but also to reestablish aesthetics and function. Especially when removal of bony parts of the mandible or the maxilla becomes necessary together with big soft tissue, an appropriate reconstruction of this different types of tissue represents a challenging problem to the maxillofacial surgeon. In addition, the need for aggressive adjuvant therapies often makes these cases even more difficult and ambitious. The survival of bone flaps is often jeopardized by adjuvant irradiation therapy, which is necessary due to the advanced tumor stage. And also the application of dental implants is complicated in irradiated bone. Nevertheless, the use of endosseous implants after major ablative surgical procedures in the head and neck region might help to enable a dental rehabilitation for these patients in order to reestablish chewing and to improve speech thus giving them back quality of life and self-confidence. In my lecture I want to share my experiences with implantology in connection with reconstructive procedures after major head and neck resections.

Raymond Wong

CV

Raymond Chung Wen Wong is a tenured Associate Professor in the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, National University of Singapore (NUS). He also serves as Vice-Dean for Graduate Education and Lifelong Learning, as well as Program Director of the Oral and Maxillofacial Surgery Residency Program. Clinically, he is the Cluster Leader for Oral and Maxillofacial Surgery and a Senior Consultant at the National University Health System (NUHS).

He graduated from the Faculty of Dentistry at the University of Malaya in 1997, receiving an entrance scholarship and awards for excellence in both basic and clinical examinations. With an ASEAN Scholarship, he completed his Master of Dental Surgery (MDS) in Oral and Maxillofacial Surgery at NUS in 2003.

From 2007 to 2008, he pursued advanced training in orthognathic surgery in the United Kingdom under the Ministry of Health Singapore's Health Manpower Development Program scholarship. He served as Specialist Registrar in Trauma and Orthognathic Surgery at Sunderland Royal Hospital and as Clinical Fellow in Cleft and Orthognathic Surgery at Morriston Hospital, Swansea.

In 2011, he obtained his PhD in Medical Sciences from Radboud University, the Netherlands. He joined NUHS in 2012 and NUS in 2015.

Abstract

Orthognathic Surgery for Obstructive Sleep Apnea

Obstructive sleep apnea (OSA) affects millions worldwide, causing repeated airway collapse during sleep, leading to fragmented rest, cardiovascular risks, and reduced quality of life. Traditional treatments like CPAP often face adherence challenges, prompting surgical innovations. This lecture explores orthognathic surgery as a transformative option, particularly maxillomandibular advancement (MMA), which repositions the jaws to enlarge the pharyngeal airway and prevent collapse.

Key techniques include Le Fort I maxillary osteotomy and bilateral sagittal split mandibular ramus osteotomies, with modifications for patients with bimaxillary proclination—such as combined advancement and setback maneuvers—to preserve facial esthetics and dental occlusion, integrated into protocols like Stanford's Phase II approach. Ideal for moderate-to-severe OSA in patients with craniofacial deficiencies, including bimaxillary protrusion common in Asian cohorts, MMA yields robust outcomes: reductions in apnea-hypopnea index (AHI) by 50–90%, improved oxygenation, and enhanced subjective sleep metrics without compromising appearance.

Evidence from clinical studies underscores MMA's superiority over isolated procedures, with long-term success rates exceeding 85% in select cohorts. Risks, such as neurosensory changes, are mitigated through multidisciplinary planning involving orthodontists and sleep specialists. Ultimately, orthognathic surgery not only alleviates OSA but restores functional harmony, offering a durable, life-altering intervention.

NATIONAL SPEAKERS

Abdulkadir Burak Çankaya

CV

Dr. Çankaya completed her undergraduate education at Istanbul University Faculty of Dentistry in 2000. After graduation, he started his doctoral education in the Department of Oral, Dental, and Maxillofacial Surgery at the same university in 2000. After receiving the title of doctor in 2006, he became an Associate Professor in 2012 and a professor in 2021. He still holds his position at the same university. Çankaya, who has many national and international publications department editorial duties in periodicals within the scope of SCI and SCI expanded, also has a book titled "The Art of Dental Suturing," written together with Prof.Dr. Korkud Demirel has already been translated into three languages. His areas of interest are bone management in pediatric oral surgery, maxillofacial traumatology, and dental implantology.

Ahmet Emin Demirbaş

CV

Assoc. Prof. Ahmet E. Demirbaş is a faculty member and the Chair of the Department of Oral and Maxillofacial Surgery at Erciyes University, Faculty of Dentistry. His clinical practice primarily focuses on the skeletal correction of dentofacial deformities, cleft lip and palate repair, and advanced implant surgery.

Dr. Demirbaş received his undergraduate degree from Marmara University, Faculty of Dentistry, and completed his specialty training and PhD in Oral and Maxillofacial Surgery at Erciyes University. In 2012, he served as a clinical observer at the Craniofacial Surgery and Research Centre, SDM College of Dental Sciences, India. Between 2019 and 2020, he worked as a research fellow at the Department of Oral and Maxillofacial Surgery, University of Bologna, Italy. In 2024, he was a clinical observer at the Department of Oral and Maxillofacial Surgery, University of Catania, Italy.

Dr. Demirbaş is an active member of national and international oral and maxillofacial surgery associations and has published over 80 peer-reviewed articles.

Abstract

Minimally Invasive Orthognathic Surgery

In the future vision of orthognathic surgery, clinical and scientific studies are anticipated to increasingly focus on patient-centered outcomes and the improvement of quality of life. In the technological domain, virtual surgical planning, artificial intelligence-based decision support systems, and patient-specific plates are coming to the forefront, while in patient management, protocols and techniques aimed at shortening recovery time and reducing complications are gaining growing importance. Within this context, one of the most striking developments is the emergence of minimally invasive surgical approaches.

Among the innovative advancements in orthognathic surgery, minimally invasive surgery stands out, although it is defined in various ways in the literature. Fundamentally, it is based on the use of smaller mucosal incisions and minimal periosteal dissection to preserve soft tissues and reduce tissue trauma. The main objectives of this approach include shortening operative time, reducing bleeding, minimizing postoperative pain and edema, and consequently lowering patient morbidity. Thus, minimally invasive approaches hold the potential to accelerate recovery and enhance patient satisfaction.

This presentation will discuss the concept of minimally invasive approaches in orthognathic surgery, the techniques applied, their advantages and limitations, and current evidence from the literature and clinical practice.

Behçet Erol

CV

Prof. Dr. Behçet Erol graduated first in his class from Hacettepe University, Faculty of Dentistry in 1975 and received the "İhsan Doğramacı Outstanding Achievement Award." He completed his PhD in Oral and Maxillofacial Surgery at Dicle University in 1984, became Associate Professor in 1989 and Professor in 1995. He has held various administrative positions at Dicle University and served as president of several national and international congresses. Prof. Erol has published numerous scientific articles, authored book chapters and textbooks, and presented more than 150 papers at scientific meetings. His main clinical and academic interests include maxillofacial trauma and fractures, temporomandibular joint surgery, orthognathic surgery, reconstructive surgery, oral and maxillofacial tumors, cleft lip and palate, dental implantology, and systemic emergencies in dentistry. He is currently the Head of the Department of Oral and Maxillofacial Surgery at İstanbul Aydin University, Faculty of Dentistry.

Belir Atalay

CV

Prof. Dr. Belir Atalay was born in Zonguldak at 1976. He was completed his primary, secondary and high school education at TED Zonguldak College and than attended Istanbul University Faculty of Dentistry in 1994. In 1999, he started his PhD education in the Department of Oral & Maxillofacial Surgery at the same Faculty and presented his PhD thesis in 2006. He received the title of "Associate Professor" in December 2012 and "Professor" in 2021. He still continues his studies in the same department at IU Faculty of Dentistry. Prof. Dr. Belir Atalay has 24 international and 8 national articles within the scope of SCI and SCI-E. He wrote 2 international scientific book chapters. There is 1 chapter in the National Cancer book. He is a referee in 2 international and 1 national journals. There are 17 national and 40 international congress and symposium participation, 23 conferences and 13 course presentations. He had surgery and clinical participation as an observer in the US Boston TUFTS University in 2006 and 2017 UIC Chicago Oral & Maxillofacial surgery chairs. He is one of the first practicing surgeons in Turkey on zygomatic implants and ceramic implants. He is a member of Turkish Oral & Maxillofacial Surgery Association, ACBID, Turkish Oral Surgery Association and ITI. Prof. Dr. Belir Atalay is married and has 2 daughters.

Berkay Tokuç

CV

Berkay TOKUÇ graduated from Marmara University, Faculty of Dentistry in 2014 and completed his specialty education in the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Kocaeli University in 2019. Following his graduation, he gained clinical experience as an oral and maxillofacial surgeon in several private clinics.

Since 2020, he has been working as a faculty member in the Department of Oral and Maxillofacial Surgery at Kocaeli University, Faculty of Dentistry. In 2022, he was appointed as Vice Dean of the faculty, and in 2024, he was appointed as an Associate Professor in Oral and Maxillofacial Surgery. Berkay TOKUÇ has authored national and international publications and has delivered several presentations at scientific meetings. In addition, he provides courses and seminars with a particular focus on alveolar bone augmentation procedures, biomaterials, and zygomatic implant treatment concepts.

His professional interests include alveolar bone augmentation, biomaterials, maxillofacial implants, and orthognathic surgery. He is a member of the International Association of Oral and Maxillofacial Surgery and Turkish Association of Oral and Maxillofacial Surgery.

Abstract

Decision-Making in the Rehabilitation of Alveolar Bone Defects: Evidence-Based Approaches

The rehabilitation of alveolar bone defects represents a major challenge in implant dentistry, since the quantity and quality of the alveolar ridge directly affect long-term functional and esthetic outcomes. Alveolar ridge deficiencies are frequently observed, commonly caused by tooth loss, periodontal disease, trauma, or pathology, and these conditions may create complex clinical scenarios where choosing the most appropriate augmentation method is essential for achieving predictable and stable results. In addition, factors such as surgical morbidity, patient expectations, and long-term stability further complicate clinical decision-making in daily practice.

A wide range of surgical techniques has been described, including guided bone regeneration, bone block grafting, crest split osteotomy, sinus floor elevation, segmental osteotomy, and distraction osteogenesis, as well as the use of autogenous, allogenic, xenogenic, and alloplastic biomaterials. Each method carries distinct advantages, limitations, and levels of evidence supporting its effectiveness. Therefore, the decision-making process requires careful evaluation of defect morphology, patient-related factors, and the long-term biological stability of the selected technique.

This lecture will focus on the management of alveolar bone defects, presenting current literature, comparative outcomes of widely used augmentation strategies, and structured treatment algorithms.

Beste Özgür

CV

Beste Özgür graduated from Hacettepe University Faculty of Dentistry and completed PhD program in Pediatric Dentistry at the same institution. Between 2016 and 2017, she worked as a postdoctoral researcher at Ohio State University under the mentorship of Prof. Paul S. Casamassimo. She has been affiliated as Associate Professor in 2024 and currently serves as a faculty member in the Department of Pediatric Dentistry at Hacettepe University. From 2016 to 2022, she served as a Board Member of the Turkish Society of Pediatric Dentistry. Dr. Özgür is an active member of both the Turkish Society of Pediatric Dentistry and the International Association of Paediatric Dentistry (IAPD).

Abstract

Dentoalveolar Traumatic Injuries in Children and Adolescents: Is Minimal Intervention an Alternative Option for Success?

This presentation addresses minimal intervention strategies in the management of dentoalveolar traumatic injuries in children and adolescents. The importance of obtaining a thorough patient history and identifying critical factors during clinical examination for accurate diagnosis will be discussed. Additionally, trauma-specific clinical and radiographic assessments, along with recent updates in the International Association of Dental Traumatology (IADT) guidelines regarding the use of antibiotics after injury, will be reviewed. The role of the oral and maxillofacial surgeon in the emergency management of fracture and luxation injuries, along with responsibilities in splinting procedures—including material selection, simplified application methods, and key considerations during repositioning—will be highlighted.

Finally, prognostic factors influencing the outcomes of traumatic injuries will be examined. Possible complications such as apical resection, autotransplantation, and severe inflammatory root resorption will be discussed, and practical clinical management guidelines will be provided for daily practice.



Çağrı Delilbaşı

CV

Dr. Çağrı DELİLBAŞI graduated from TED Ankara College in 1992 and from Gazi University Faculty of Dentistry in 1997. He completed his PhD at Ankara University Faculty of Dentistry Department of Oral and Maxillofacial Surgery between 1997-2001. He was granted for Japanese Governmental scholarship between 2001-2003 at Osaka University. He worked at Yeditepe University as a lecturer and associate professor between 2003-2011. Since 2011 he has been at İstanbul Medipol University school of Dentistry, Department of Oral and Maxillofacial Surgery as a professor and head of the department. Dr. Delilbaşı has many publications and presentations.

Emre Benlidayı

CV

Prof.Dr.Benlidayı graduated from Çukurova University Faculty of Dentistry in 2001. He completed his doctorate and specialization training in the Oral and Maxillofacial Surgery Department of the same faculty in 2008. He visited London King's College Hospital Maxillofacial Surgery Department in 2006 and Salzburg Paracelsus Medical University Maxillofacial Surgery Department in 2014 and engaged in clinical and academic activities.

He undertook the task of course director at the Çukurova Orthognathic Surgery Days and Cadaver Course, which was held for the first time in 2016 and for the second time in 2018 in Turkey.

Prof.Dr.M.Emre BENLIDAYI worked as the Head of the Department of Oral and Maxillofacial Surgery at Çukurova University Faculty of Dentistry between 2014 and 2017. In 2019, he was elected as a board member of the Turkish Association of Oral and Maxillofacial Surgery.

Prof.Dr.M.Emre BENLIDAYI, who received the title of Associate Professor in 2013 and the title of Professor in 2019, has more than 60 articles published in national and international journals, and more than 100 posters/oral papers presented in national and international congresses. More than 900 references have been made to Dr. Benlidayı's publications to date.

He has clinical and experimental projects supported by TÜBİTAK, Dentsply, ITI, TFI and Çukurova University Scientific Research Projects Unit.

Prof.Dr.M.Emre BENLIDAYI, who is still a faculty member at Çukurova University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, is interested in orthognathic surgery, advanced implant surgery, cleft lip and palate surgery and hard tissue laboratory research.

Erol Cansız**CV**

He was born in Istanbul in 1983. After he graduated from Marmara University Faculty of Dentistry (Istanbul) he finished his specialty training at Istanbul University Faculty of Dentistry (Istanbul), Oral and Maxillofacial Surgery Department and became a faculty member in the same department. In 2015 in order to improve his knowledge and experience on maxillofacial surgery he worked for six months in Istanbul University, Cerrahpasa Faculty of Medicine, Department of Otorhinolaryngology. Also he worked in Osnabruck, Germany, at Clinicum Osnabruck Department of Maxillofacial Surgery, and in London, England, at St.Georges Medical University Department of Maxillofacial Surgery. In 2022 he graduated from Bezmialem Foundation University, Faculty of Medicine and he had medical degree. In August 2019, he received the title of Associate Professor in Oral and Maxillofacial Surgery. Erol CANSIZ has been working in the Department of Oral and Maxillofacial Surgery of Istanbul University Faculty of Medicine since 2019 and with an additional task at the Department of Oral and Maxillofacial Surgery of Istanbul University Faculty of Dentistry, academically and clinically.

Mehmet Emre Yurttutan

CV

Assoc. Prof. Dr. Emre Yurttutan received his DDS degree from Ankara University Faculty of Dentistry in 2008 and completed his PhD and specialist training in Oral and Maxillofacial Surgery at the same faculty in 2014. He was appointed as Associate Professor in 2021 and currently serves in the Department of Oral and Maxillofacial Surgery at Ankara University. His clinical and research interests focus on oral implantology, maxillofacial reconstruction, orthognathic surgery, conservative and surgical management of temporomandibular joint disorders.

Abstract

Current Approaches to Immediate Implant Placement and Loading Protocols

Immediate implant procedures allow placement at the time of extraction with the possibility of early loading, offering faster treatment and improved patient satisfaction. Success, however, relies on proper case selection, achieving sufficient primary stability, and careful soft tissue management. In this presentation, current concepts, clinical tips, and evidence-based strategies for immediate implant placement and loading will be highlighted to help clinicians achieve predictable functional and esthetic outcomes.

Mehmet Fatih Şentürk

CV

Prof. Dr. Mehmet Fatih ŞENTÜRK graduated from Ankara University Faculty of Dentistry in 2008. He completed his doctorate and specialist training in Oral and Maxillofacial Surgery at the same faculty between 2008-2013. He served as a faculty member at Süleyman Demirel University Faculty of Dentistry, where he joined the Faculty Member Training Program, between 2013-2020. He currently serves as a faculty member in the Department of Oral and Maxillofacial Surgery at Ankara Yıldırım Beyazıt University Faculty of Dentistry. Prof. Dr. Mehmet Fatih Şentürk, who has served as Vice Dean, Chief Physician, Senate Member, and Department Head, has numerous national – international publications and presentations.

Abstract

Current Techniques in TMJ Arthrocentesis

TMJ arthrocentesis is an effective, reproducible, low-cost, minimally invasive surgical procedure that can be used especially in the surgical treatment of internal derangements. The easier application of this surgical procedure offers positive results in terms of the success of the procedure and patient-surgeon satisfaction. For this purpose, single puncture arthrocentesis (SPA) techniques which are based on the principle of entering the TMJ from a single point have been developed as strong alternatives to the double puncture arthrocentesis (DPA) techniques, which is classically based on the principle of inserting 2 needles from 2 different points. The latest innovations in SPA and DPA techniques are the subject of this speech.

Özge Doğanay Özyılmaz

CV

Dr. Özge Doğanay Özyılmaz graduated from Yeditepe University Faculty of Dentistry in 2011 and completed her residency training in Oral and Maxillofacial Surgery at Istanbul University, Faculty of Dentistry between 2012 and 2017. Since 2017, she has been serving as a faculty member in the Department of Oral and Maxillofacial Surgery at Bezmialem Vakif University Faculty of Dentistry, and she was awarded the title of Associate Professor in 2021.

In 2019, she was granted a scholarship by the International Association of Oral and Maxillofacial Surgeons (IAOMS), during which she worked as a visiting researcher at the University of Illinois at Chicago (UIC) and Northwestern Memorial Hospital (NMH), conducting several scientific studies.

Dr. Özyılmaz has authored articles published in national and international journals, conference presentations, book chapters, translations, as well as holding patents and utility model registrations. Her main areas of interest include orthognathic surgery, maxillofacial trauma, nerve injuries, implantology, and hard and soft tissue reconstruction.

Abstract

Planning and Clinical Considerations in Subperiosteal Implants

Subperiosteal implants (SPIs) have regained significance in contemporary practice due to advancements in computer-aided design (CAD), computer-aided manufacturing (CAM), development of novel biomaterials, improvements in surface technologies, and a better understanding of bone biomechanics. Current SPIs designed with CAD and fabricated using additive manufacturing technologies offer considerable advantages over their earlier counterparts, including single-stage surgery, the possibility of immediate loading, enhanced fit accuracy, and reduced operative time. These innovations facilitate easier planning, design, and fabrication of SPIs, while creating a less traumatic experience for patients and ensuring high precision during production. Modern SPIs are particularly considered as an alternative treatment option in cases of advanced bone atrophy where grafting is not feasible or has failed, as well as in oncologic cases, congenital defects, or trauma-related bone loss.

Indication and design play a key role in the success of subperiosteal implants. Additionally, the surgical technique, patient anatomy, and soft-tissue quality contribute significantly to achieving favorable clinical outcomes.

This presentation discusses the indications and design principles of digitally manufactured, contemporary subperiosteal implants. It also examines critical considerations in personalized planning workflows and strategies to prevent early and late biological complications in detail.

Ufuk Tatlı

CV

Dr. Ufuk Tatlı currently serves as Professor and Chair at the department of Oral and Maxillofacial Surgery (OMFS) in Cukurova University School of Dentistry in Adana, Türkiye. He completed his dental education at Hacettepe University in Ankara, Türkiye, and went on to complete his combined OMFS residency and PhD educations at Cukurova University in Adana, Türkiye. After completing his residency education, Dr. Tatlı continued his academic career as a full-time faculty at Cukurova University OMFS department. Dr. Tatlı was promoted to associate professor in 2015 and full professor in 2020. Dr. Tatlı completed a Cranio-Maxillofacial Surgery Fellowship education at Hannover Medical School in Hannover, Germany in 2013. Dr. Tatlı stayed as a visiting professor in the departments of OMFS at Charles University Medical School in Prague, Czech Republic in 2016 and at Boston University School of Dental Medicine in Boston, USA in 2018. After 18 years of professional experience at Cukurova University, Dr. Tatlı moved to the United States and continued his academic career as a full-time faculty between 2023-2025 in the department of OMFS at Marquette University in Milwaukee, USA. In 2024, Dr. Tatlı was named Fellow for International College of Dentists (FICD) USA section. In 2024, Dr. Tatlı was selected to serve as Guest Editor for a special issue titled "Research on Advanced Dental Biomaterials for Regeneration and Reconstruction in Oral and Maxillofacial Surgery" for prestigious "Materials" journal (SCIE, Q1, Impact factor: 3.1). In 2025, Dr. Tatlı returned to his home country Türkiye and he has been serving as full-time faculty in Cukurova University School of Dentistry in Adana, Türkiye, ever since.

Ümit Ertas

CV

Prof. Dr. Umit Ertas graduated from Ataturk University Faculty of Dentistry in 1994. In 1999, he completed his doctorate in the Department of Oral and Maxillofacial Surgery at Ataturk University Faculty of Dentistry and received the title of "Dr." He was entitled to receive the title of Professor in 2012 at the same university. He has numerous national and international scientific articles and has been cited in international scientific articles. He gives numerous national and international conferences, seminars and courses on topics such as maxillofacial surgery, orthognathic surgery, traumatology, cleft lip and palate and temporomandibular joint surgery.

Yavuz Tolga Korkmaz

CV

Dr. Yavuz Tolga Korkmaz graduated from Gazi University Faculty of Dentistry in 2003 and PhD in 2010 at Gazi University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery. In 2011 he had started to Karadeniz Technical University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery and appointed to teaching staff as an Assistant Professor. Dr. Korkmaz had gained the title of Associate Professor in 2018. He appointed as a Professor in 2023. He is currently Chairman of the Department of Oral Maxillofacial Surgery at the same university. Dr. Korkmaz has many national and international research articles and book chapters in scientific book and journals. Dr. Korkmaz is the member of Turkish Association of Oral and Maxillofacial Surgeons (TAOMS). Dr Korkmaz's areas of clinical and research interest are orthognathic surgery, temporomandibular joint disorders' clinical and surgical treatments, advanced dental implant surgery, dentoalveolar surgery and maxillofacial trauma.

Yusuf Emes

CV

Yusuf Emes was born in Istanbul in 1974 and graduated from the Faculty of Dentistry at Istanbul University in 1997. He received his Ph.D. degree in Oral and Maxillofacial Surgery from the Faculty of Dentistry at Istanbul University in 2005 and was awarded the title of Associate Professor in 2012. He is currently serving as a faculty member in the Department of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Istanbul University.

Abstract

Temporomandibuler eklem rahatsızlıklarında konservatif tedavi yöntemleri
Temporomandibuler eklem (TME) rahatsızlıkları, kas kökenli bozukluklardan eklem içi patolojilere kadar geniş bir spektrumda değerlendirilir. Bu hastalıkların yönetiminde çeşitli tedavi yaklaşımları tek başına veya kombin olarak uygulanabilmektedir. Bu sunumda, temporomandibuler eklem rahatsızlıklarının tedavisinde kullanılan konservatif tedavi yöntemleri gözden geçirilecektir.

YOUNG TAOMS SPEAKERS

Begüm Elbir

CV

Educational Background:

2000-2008 İstek Barış Primary School

2008-2013 Saint Joseph French High School

2013-2018 DDS, Yeditepe University Faculty of Dentistry (Graduated with an honor degree as 3rd)

2018-2023 PhD, Medipol University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery

Academic Background:

October 2022 - October 2023 Lecturer and Clinical Instructor at Bahçeşehir University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery

November 2023 - July 2024 Assist. Prof. at İstanbul Medipol University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery

April 2024 – June 2024 Visiting Doctor/Observership at University of Illinois Chicago, Department of Oral and Maxillofacial Surgery

November 2024 – present Assist. Prof. at İstanbul Atlas University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery

Languages:

Turkish (native)

English (full professional proficiency)

French (full professional proficiency)

Additional Training and Accomplishments on Oral and Maxillofacial Surgery:

1st place with oral presentation "Dentists' Knowledge and Attitude about Oral Mucosal Lesions" at YUDBAT International Student Congress (2018) in İstanbul, Turkey

Hands on workshop about sutures and regenerative therapies in aesthetic implantology at EDSA Meeting & ANEO Congress in Barcelona, Spain

Oral presentation "Patients' Awareness and Knowledge About Oral and Maxillofacial Surgery" at AÇBİD International Congress (2019) in Antalya, Turkey

Hands on workshop at Principles of Orthognathic Surgery Symposium (AÇBİD) in Ankara, Turkey

Dental XP Conference 2019 in İstanbul, Turkey

Bego's training about "Implant applications in aesthetic zones" in İstanbul, Turkey

Nucleoss Dental Implants Congress 2019 in Antalya, Turkey

Regular attendance to ITI study clubs, IDO (İstanbul Chamber of Dentists) and TDB (Turkish Association of Dentists) meetings

Oral presentation "Evaluation of Bruxism Incidence Among Patients Using SSRIs" at TAOMS International Online Congress (2020)

First place oral presentation "Three-dimensional changes of nose in virtually planned patients: Can ideal values solely be achieved by orthognathic surgery?" at EACMFS Online Congress (2021)

Oral presentation "Assessment of Lower Face Esthetics in Virtually Planned Patients After Orthognathic Surgery" at AÇBİD Congress (2022) in Antalya, Turkey

EACMFS Congress 2022 in Madrid, Spain

AO CMF Management of Facial Trauma Practical Course (2023) in Bologna, Italy

Oral presentation "Segmented LeFort I Maxillary Osteotomy Experience: A Retrospective Follow Up of 76 Patients" at AÇBİD Congress (2023) in Antalya, Turkey

Oral presentation "Comparison of Biomechanical Properties of TMJ Prostheses Manufactured by Machining and Powder Metallurgy" at AÇBİD Congress (2023) in Antalya, Turkey

Memberships:

ITI

European Association of Craniomaxillofacial Surgery (EACMFS)

Turkish Association of Oral and Maxillofacial Surgeons (AÇBİD)

Job Experience:

Dentataşehir 2 Dental Clinic: Oral and Maxillofacial surgeon

İşık Diş Dental Clinic: Oral and Maxillofacial surgeon

Udento Dental Clinic: Oral and Maxillofacial surgeon

Özel Dental Clinic: Oral and Maxillofacial surgeon

"Botulinum Toxin for Facial Harmony": Course Lecturer

Natural Clinic Oral and Maxillofacial surgeon

International Plus Clinic Oral and Maxillofacial surgeon

Begler Dental Clinic Oral and Maxillofacial surgeon

Vera Hospitals Group Oral and Maxillofacial surgeon

Dentgroup Nişantaşı Oral and Maxillofacial surgeon

Publications:

Elbir B, Kolsuz N, Varol A. Ulus Travma Acil Cerrahi Derg. External mandibular fixation for gunshot fractures: report of 2 cases. 2022.

Özel A., Elbir B., Çukurova Yılmaz Z.G., Uçkan S. European Archives of Oto-Rhino-Laryngology. Analysis of select esthetic nasal parameters in virtually planned orthognathic patients. 2023.

Güldiken İ, Elbir B, Delilbaşı Ç. Psych Dan. Investigation of the Effect of the Onset of Bruxism as a Result of Early Antidepressant Use. 2024.

Elbir B, Codner Kai, Miloro M. BJOMS. To What Extent Does Social Media Influence Patient Choice of Surgeon for Temporomandibular Joint Replacement? 2025

Honors and Awards:

EACMFS John Lowry Congress Scholarship Awardee, 2021

ACBİD Timucin Baykul Overseas Experience Scholarship Awardee, 2024

Books and Book Chapters:

Fasiyal Harmoni için Botulinum Toksin Uygulamaları, Develi T., Akk B., Elbir B., Quintessence Publishing Türkiye, 2023

Abstract

From Function to Aesthetics: The Dual Impact of Orthognathic Surgery

Orthognathic surgery is a treatment approach that provides not only functional improvements but also significant enhancements in facial aesthetics by correcting skeletal discrepancies of the jaws. This presentation will focus on the dual interaction between the functional and aesthetic aspects of orthognathic surgery, discussing current literature and up-to-date data.

Orthognathic surgery considers function and aesthetics not as separate entities, but as two complementary components. While the procedure has functional effects on mastication, respiration, speech, and overall quality of life, its aesthetic contributions to facial proportions and profile balance should also be emphasized. Therefore, these proportions and balances must be carefully evaluated during preoperative planning. Today, with the support of digital surgical planning techniques, when combined with appropriate surgical methods, this approach provides the most ideal and long-lasting postoperative outcomes.

Betül Gedik Tarhan

CV

Dr. Betül Gedik Tarhan is conducting her postdoctoral studies at the Department of Oral and Maxillofacial Surgery, Istanbul University, and at the Stem Cell Research Center, Chulalongkorn University. Her research areas are dental implantology, regenerative surgery, tissue engineering, and stem cell-based therapies. Her studies include drug-delivery systems, biomechanics of zirconia implants, innovative approaches in the treatment of MRONJ, and patient-specific implants after cancer surgery. She has taken part in national and international research projects, and has articles published in reputable journals and scientific presentations.

Beyza Kahraman

CV

Academic and Professional Participation

Temporomandibular Joint Disorders Congress, Bezmialem Vakif University, 2022

ITI Section A, 2022

International Congress of ACBID, 2023

ITI Section A, 2023

Temporomandibular Joint Surgery Cadaver Course, organized by ACBID, 2023

Professional Experience

Dentist, Uzdent Dental Hospital, Kayseri (Dec 2019 – Feb 2020)

After graduating from Erciyes University, Faculty of Dentistry in 2018, I spent one year preparing for the DUS (Specialization Examination in Dentistry). Following the exam, I worked for two months at Uzdent Dental Hospital. During this period, I was admitted to the PhD program, and in line with my long-term academic plans, I decided to resign from the position. On February 20, 2020, I began my PhD studies at the Department of Oral and Maxillofacial Surgery, Erciyes University, where I am still continuing my doctoral education. In parallel with my studies, I also work part-time in various private clinics.

Education

DDS: Faculty of Dentistry, Erciyes University, Kayseri (2018)

PhD: Department of Oral and Maxillofacial Surgery, Erciyes University (2020 – ongoing)

Abstract

Accuracy of Surgical Guides in the Digital Planning Era

Computer-assisted implantology represents one of the most significant advancements in the digital transformation of dentistry, enabling surgical planning to become more predictable and precise. Through the integration of cone beam computed tomography (CBCT), digital scanning systems, and specialized planning software, this approach allows for highly accurate implant placement. The guiding systems used in digital implantology are generally categorized as dynamic and static. Dynamic systems support implant positioning through real-time navigation, whereas static systems transfer the digitally planned implant position to the oral cavity via custom-fabricated surgical guides. Static guided surgery has become widely preferred in clinical practice due to its advantages, such as improved planning precision, reduced operation time, and minimized surgical trauma. However, factors such as the algorithmic structure of the software, the method of guide fabrication, and the precision of data processing can directly influence the accuracy of implant placement.

Keywords: digital implantology, dental implant, guided surgery.

Busehan Bilgin

CV

Upon initially graduating with first-class honors degree in dentistry from Başkent University in 2017 Dr Bilgin, awarded specialist degree in Oral and Maxillofacial Surgery from Faculty of Dentistry, Akdeniz University in 2023. She still works in the Oral and Maxillofacial Surgery department at Akdeniz University.

Dr. Bilgin's areas of clinical and research interest are dental implantology, TMJ, oral diseases, surgical anatomy, oral pathology, orthognathic surgery, maxillofacial abnormalities, craniomandibular disorders and maxillofacial trauma. She has several publications in the peer reviewed literature.

Abstract

The Surgical Spectrum of Ameloblastoma: A Patient-Specific Strategic Approach

Ameloblastoma is a locally aggressive benign tumor of epithelial origin, representing a considerable proportion of odontogenic lesions in the maxillofacial region. Clinically, ameloblastoma typically presents as a slow-growing, painless swelling that causes cortical bone expansion. Over time, this may lead to functional impairment and aesthetic deformity. Diagnosis is often delayed, likely due to its indolent growth pattern.

Despite its benign nature, ameloblastoma exhibits aggressive behavior and is associated with a high risk of recurrence. Management strategies range from conservative procedures, such as enucleation, curettage, and marsupialization, to radical approaches including marginal or segmental resection. In some cases, Carnoy's solution is applied as an adjunct to conservative surgery to reduce the risk of recurrence. The choice of surgical technique depends on multiple factors, including tumor type, size, location, clinical behavior, and patient-related considerations such as age and socioeconomic status. Conservative techniques may be appropriate for less aggressive lesions and offer advantages such as shorter operative time, faster recovery, and simpler reconstruction, although they have been associated with higher recurrence rates. Radical surgery is generally preferred for aggressive lesions, achieving lower recurrence but often resulting in significant hard and soft tissue defects. These consequences may complicate subsequent reconstruction aimed at restoring both function and appearance. Reconstruction techniques include autologous bone grafts, free vascularized flaps, and alloplastic materials. In resections involving the condylar region, temporomandibular joint prostheses provide functional stability and anatomical compatibility.

This presentation reviews various surgical approaches applied to ameloblastoma cases treated in our clinic and highlights the potential role of tailoring the surgical strategy to patient and lesion-specific characteristics in reducing recurrence risk, preserving functional structures, and improving aesthetic outcomes.

Onur Evren Kahraman

CV

EDUCATION

PhD in Oral and Maxillofacial Surgery
Çukurova University, Faculty of Dentistry, 2008–2013
Doctor of Dental Surgery (DDS)
Çukurova University, Faculty of Dentistry, 2002–2008

ACADEMIC AND CLINICAL EXPERIENCE

Assistant Professor, Çukurova University, Department of Oral and Maxillofacial Surgery (Present)
Oral and Maxillofacial Surgeon, Private Clinic (2021–2024)
Assistant Professor, Fırat University (2015–2021)
OMF Surgeon, Acıbadem Hospital, Adana (2013–2015)
Research Assistant, Çukurova University (2010–2013)
PhD Student, Çukurova University (2008–2010)

CLINICAL ROTATIONS

Anesthesiology and Reanimation – Çukurova University School of Medicine (2012–2013)
Otorhinolaryngology (ENT) – Çukurova University School of Medicine (2013)

DOCTORAL THESIS

Effects of Locally Applied Simvastatin on Periosteal Distraction

Çukurova University, 2013

PUBLICATIONS

International Peer-Reviewed Articles

Benlidayı ME, Gaggl A, Buerger H, Kahraman OE, Sencar L, Brandtner C, Kurkcu M, Polat S, Borumandi F. Comparative study of the osseous healing process following three different techniques of bone augmentation in the mandible: an experimental study. *Int J Oral Maxillofac Surg.* 2014 Nov;43(11):1404-10. doi:10.1016/j.ijom.2014.07.004.

Kahraman OE, Erdogan O, Namli H, Sencar L. Effects of Locally Applied Simvastatin on Periosteal Distraction Osteogenesis. *Br J Oral Maxillofac Surg.* 2015 Jan 29. doi:10.1016/j.bjoms.2015.01.006.
Namli H, Erdoğan Ö, Gönlüşeb G, Kahraman OE, Aydin HM, Karabag S, Tatlı U. Vertical Bone Augmentation Using Bone Marrow Derived Stem Cells; An in vivo Study in the Rabbit Calvaria. *J Implant Dent.* 2016 Feb;25(1):54-62. doi:10.1097/ID.0000000000000334.

Karaman T, Kahraman OE, Eser B, Altintas E, Talo Yildirim T, Oztekin F. Evaluation of the accuracy of the mechanical torque wrench by the number of uses and ratchet type. *Am J Dent.* 2019 Oct;32(5):251-254.

Yıldırım TT, Dündar S, Bozoğlan A, Karaman T, Kahraman OE, Özcan EC. The effects of metformin on the bone filling ratio around of TiAl6Va4 implants in non diabetic rats. *J Oral Biol Craniofac Res.* 2020 Oct-Dec;10(4):474-477. doi:10.1016/j.jobcr.2020.07.012.

Talo Yıldırım T, Dündar S, Bozoğlan A, Karaman T, Tekin S, Kahraman OE. Evaluation of the Effects of β -Adrenergic Receptor-Propranolol on Osseointegration of the Titanium Implants. *J Craniofac Surg.* 2021 Mar-Apr;32(2):783-786.

Seyrek NK, Kahraman OE. The effect of different positions of unerupted lower third molar teeth on the fragility of mandibular angle: Finite element analysis. *Niger J Clin Pract.* 2022 Oct;25(10):1629-1634.

Kahraman OE, Karaman T, Talo Yıldırım T, Önalan E, Dündar S, Tektemur A. The effect of ionizing radiation from dental radiographic devices on dental pulp stem cells. *Int Dent Res.* 2023;13(3):112-8. doi:10.5577/intdentres.278

Orak B, Akgül M, Akdoğan T, Kahraman OE. Evaluation of implant primary stability using different drilling protocols: an in vitro study. *BMC Oral Health.* 2025 Aug 9;25(1):1306. doi: 10.1186/s12903-025-06661-4. PMID: 40783517; PMCID: PMC12335120.

National Peer-Reviewed Articles

Altuğ HA, Erdoğan Ö, Metinyurt G, Kahraman OE. Odontojenik Enfeksiyonlarda Temel Enflamasyon Belirteçleri ile Beraber C3 ve C4 Kompleman Faktörlerinin Seviyeleri. Çukurova Üniversitesi Sağlık Bilimleri Dergisi, 26 (9-15), 2010.

Erdoğan Ö, Sanrı M, Kahraman OE. Ağız, çene, yüz cerrahisinde çekme vidalarının kullanımı üzerine literatür derlemesi. GÜ Diş Hek Fak Derg, 28(3):225-32, 2011.

PRESENTATIONS

Oral Presentations

Kahraman OE, Erdoğan Ö. Periosteal distraction using a new periosteal distraction device: An in vivo study in rabbits. 7th International AÇBİD Congress of Oral and Maxillofacial Surgery, 29 May–2 June 2013, Antalya.

Keçecioğlu Seyrek N, Kahraman OE. Assessment of Accurate Angle for the Vertical Cut in Ramus Osteotomies: A Tomographic Study. 14th International AÇBİD Congress of Oral and Maxillofacial Surgery, 7–9 May 2021 (Online).

Dayanan C, Kahraman OE, Tektemur A. Evaluation of Irrigation Solution Temperatures Used In Drilling Procedure On Various Gene Expressions. 14th International AÇBİD Congress of Oral and Maxillofacial Surgery, 7–9 May 2021 (Online).

Poster Presentations

Kahraman OE, Meriç A, Aysan İ, Erdoğan Ö, Tatlı U. Intrusion of posterior teeth using mini-screw implants for implant rehabilitation. 7th International AÇBİD Congress of Oral and Maxillofacial Surgery, 29 May–2 June 2013, Antalya.

Benlidayı ME, Gaggl A, Buerger C, Kurkcu M, Kahraman OE, Polat S, Sencar L. Comparative study of the osseous healing process following three different techniques of bone augmentation of the mandible: An experimental study. American Association of Oral and Maxillofacial Surgeons 94th Annual Meeting, San Diego, USA, September 2013.

BOOK CHAPTERS

Kahraman OE. Dental Stem Cells And Their Uses In Dentistry. In: Academic Studies in Health Sciences-II Volume 1. Editor: Prof. Dr. Cem Evreklioğlu. June 2020. ISBN: 978-625-7884-59-4.

Abstract

Vestibuloplasty and Repositional Flap: A New Technique

Severe alveolar ridge resorption leads to a reduction in vestibular depth and loss of keratinized mucosa, adversely affecting prosthesis stability and soft tissue health. In such cases, vestibuloplasty combined with excision of the hypermobile mucosa is often preferred; however, this approach may result in the complete loss of existing keratinized tissue.

This presentation introduces the Pedicled Repositional Split-Flap Technique, which eliminates the need for a donor site and enables the repositioning of keratinized, hypermobile mucosa onto the alveolar ridge. The technique is combined with Clark's vestibuloplasty, allowing simultaneous deepening of the vestibule and increasing the amount of keratinized mucosa while achieving tissue gain without the need for a second surgical site.

In the treated cases, an average gain of 7 mm of immobile keratinized mucosa was achieved. The repositioned tissue maintained its keratinized character and stability throughout the follow-up period. This method provides an effective, safe, and low-morbidity alternative for creating a stable soft tissue surface in severely resorbed mandibles, either before prosthetic rehabilitation or to increase the amount of keratinized mucosa in implant-planned regions.

Sinem Aksu

CV

Education

High School: Levent Aydın Anatolian High School – Graduation Year: 2013

Undergraduate: İstanbul Okan University, Faculty of Dentistry – Graduation Year: 2020

Specialization: Akdeniz University, Department of Oral and Maxillofacial Surgery – 2020–2025

Professional Experience

Position: Specialist Dentist (Oral and Maxillofacial Surgery)

Institution: Akdeniz University, Department of Oral and Maxillofacial Surgery

Period: 2025 – Present

Scientific Presentations – Oral

Aksu S, Altay M.A.

The Role of Differential Diagnosis in the Early Detection of Oral Cancers: Case Reports and a Current Literature Review.

26th International Dental Congress of the Turkish Dental Association; September 8–11, 2022; İstanbul, Türkiye.

Aksu S, Kaynak A.D, Şimşek Kaya G, Sindel A, Altay M.A.

Sclerotherapy in the Treatment of Intraoral Vascular Malformations: A Case Report and Literature Review.

29th International Scientific Congress of the Turkish Association of Oral and Maxillofacial Surgery; November 6–10, 2022; Antalya, Türkiye.

Aksu S, Özgen B, Karaca B, Şimşek Kaya G, Altay M.A, Sindel A.

Large Nasopalatine Duct Cyst: A Case Report.

29th International Scientific Congress of the Turkish Association of Oral and Maxillofacial Surgery; November 6–10, 2022; Antalya, Türkiye.

Aksu S, Kaynak A.D, Altay M.A.

Positional Evaluation of Implants Placed Using Mucosa-Supported Static Surgical Guides: A Retrospective Analysis.

30th International Scientific Congress of the Turkish Association of Oral and Maxillofacial Surgery; November 17–21, 2023; Antalya, Türkiye.

Oğlakkaya Ö.O, Aksu S, Şimşek Kaya G, Sindel A, Altay M.A.

Evaluation of the Effects of Antihypertensive Drugs on Implant Osseointegration.

FDI World Dental Congress; September 12–15, 2024; İstanbul, Türkiye.

Scientific Presentations – Poster

Aksu S, Altay M.A.

A Diagnosis That Should Not Be Overlooked in Persistent Orofacial Infections: Actinomycosis – A Case Report.

26th International Dental Congress of the Turkish Dental Association; September 8–11, 2022; İstanbul, Türkiye.

Abstract

Reducing Morbidity in Surgical Maxillary Expansion: What Extent and How Is It Possible?

Le Fort I osteotomy has long been accepted as the gold standard approach for the surgical correction of transverse maxillary deficiency in skeletally mature patients. However, this procedure may lead to undesirable aesthetic changes in the morphology of the nasolabial region. Numerous studies in the literature consistently report unfavorable outcomes following Le Fort I osteotomy, including upper lip lengthening and thinning, decreased vermillion display, and widening of the nasal base. These alterations require careful clinical consideration, particularly in adult individuals, as they may negatively affect facial proportions and profile aesthetics in the postoperative period.

With a better understanding of the etiopathogenesis of these complications in recent years, minimally invasive surgical strategies have been developed to limit the extent of classic osteotomy lines and soft tissue manipulation. The primary goal of these techniques is to minimize surgical trauma in the maxillofacial region, preserve soft-tissue integrity and regional vascularity, and facilitate biologically favorable healing. Minimally invasive procedures typically incorporate limited vestibular incisions, piezoelectric or ultrasonic osteotomy systems, guided cutting protocols, and selective corticotomies performed under local anesthesia. Consequently, operative duration is reduced, postoperative pain and edema are minimized, and soft-tissue contours and facial aesthetics are largely preserved.

In this context, the concept of minimally invasive surgically assisted rapid maxillary expansion (miSARME) has emerged as a more conservative and biologically compatible alternative to the traditional surgically assisted rapid maxillary expansion (SARME) techniques. miSARME aims to achieve sufficient transverse expansion in adult patients with partially ossified midpalatal sutures, while offering lower morbidity and minimal aesthetic side effects compared with conventional Le Fort I osteotomy. Current clinical evidence indicates that this technique provides adequate skeletal expansion, results in lower postoperative pain and edema scores, promotes faster functional recovery, and improves patient satisfaction.

In this presentation, a clinical case employing the miSARME technique for the management of transverse maxillary deficiency will be discussed, and its clinical feasibility along with its potential advantages over traditional SARME will be evaluated.

Sinem Büşra Kıracı Can

CV

Sinem Büşra Kıracı Can was born on September 15, 1993, in Eskişehir, Türkiye. She graduated from Istanbul University, Faculty of Dentistry in 2016, and completed her specialty training in the Department of Oral and Maxillofacial Surgery at Marmara University, Faculty of Dentistry in 2023. Between 2023 and 2024, she served as a specialist in the same department, and since 2025 she has been working as an Assistant Professor at Marmara University, Faculty of Dentistry. Her academic work includes 5 international and 1 national published articles, 4 international congress presentations, and 2 international congress posters. Her research interests cover oral and dentoalveolar surgery, dental implantology, maxillofacial surgery, temporomandibular joint surgery, orthognathic surgery, and pain management.

Abstract

Vertical Alveolar Ridge Augmentation Using the Shell Technique: Surgical Technique and Clinical Pearls

Vertical alveolar ridge deficiencies can compromise implant placement, often necessitating additional surgical interventions such as nerve lateralization or vertical bone augmentation. Among various bone augmentation techniques, vertical ridge augmentation is one of the challenging procedures in implant dentistry because it requires high surgical precision and is performed outside the natural bone envelope, in an area with poor vascularity. Careful surgical planning and effective soft tissue management are essential to achieve successful outcomes.

In the shell technique, thin cortical bone plates are placed vertically to the residual alveolar ridge and stabilized at the level of the crest. The space created between the lamellae is filled with particulate bone graft material.

Several clinical principles are essential for the success of this technique. Proper case selection and thorough evaluation of the donor site are the primary considerations for a successful outcome. In addition, adequate flap design, precise splitting and shaping of the harvested bone, correct positioning and rigid fixation of the cortical lamellae at the desired height and contour, appropriate choice of graft material, and tension-free flap closure are all critical factors influencing the success of the procedure.

The main disadvantages of vertical bone augmentation using the shell technique are intraoral donor site morbidity and the prolonged edentulous period. However, despite these drawbacks, the technique offers numerous advantages. When performed carefully, it enables predictable vertical bone reconstruction and regeneration of the alveolar ridge, thereby creating ideal conditions for implant placement and prosthetic rehabilitation. In this presentation, the fundamental principles of vertical alveolar ridge augmentation using the shell technique, the surgical workflow, and key clinical tips that enhance treatment success will be presented, and the advantages and disadvantages of this technique will be discussed in comparison with other vertical augmentation methods.

Soner Sağaltıcı

CV

Specialist Dentist in Oral and Maxillofacial Surgery

Istanbul University – Department of Oral and Maxillofacial Surgery / Specialist Dentist

Continuing as a Specialist Dentist as of January 17, 2025

Istanbul University – Department of Oral and Maxillofacial Surgery / Research Assistant

2020 – 2025

Hatay Mustafa Kemal University – Faculty of Dentistry

Graduated in 2018, GPA: 3.24/4

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Seminars

XXXI. Türk Oral İmplantoloji Derneği Bilimsel Kongresi İstanbul 2022

Türk Oral ve Maksillofusal Cerrahi 13. Bilimsel Sempozyumu Erzurum 2022

Türk Oral ve Maksillofusal Cerrahi 29. Bilimsel Kongresi Antalya 2022

Bilimplant Kongresi Antalya 2022

XXXII. Türk Oral İmplantoloji Derneği Bilimsel Kongresi İstanbul 2023

Oral Reconstruction International Symposium 2023 in Rome Italy

IV. A'dan Z'ye Oral İmplantoloji Sempozyumu Kıbrıs 2023

Türk Oral ve Maksillofusal Cerrahi 30. Bilimsel Kongresi Antalya 2023

XXXIII. Türk Oral İmplantoloji Derneği Bilimsel Kongresi İstanbul 2024

Füzyon-Planlamadan Ameliyata Ortognatik Cerrahi Kursu 2024

ITI Akademik SC 1. Toplantısı İstanbul 2024

Türk Oral ve Maksillofusal Cerrahi 14. Bilimsel Sempozyumu Adana 2024

Oral Reconstruction International Symposium 2024 in Abu Dhabi

FDI Dünya Diş Hekimliği Kongresi İstanbul 2024

Türk Oral ve Maksillofusal Cerrahi 31. Bilimsel Kongresi Bodrum 2024

İmplantolojide Dijital Dönüşüm ve Klinik Deneyim Belgrad Sırbistan 2025

Şafak Yağan Taş

CV

Şafak Yağan Taş completed her undergraduate studies at Erciyes University, Faculty of Dentistry, between 2013 and 2018. In 2020, she began her specialty training in the Department of Oral and Maxillofacial Surgery at Erciyes University, Faculty of Dentistry. In 2025, she completed her thesis entitled "Investigation of the Effects of Arthroscopy and Arthrocentesis Methods in Temporomandibular Joint Disorders" and was awarded the title of Oral and Maxillofacial Surgeon. She is currently serving as a Research Assistant in the Department of Oral and Maxillofacial Surgery at Erciyes University, Faculty of Dentistry.

Abstract

Clinical Tips in Temporomandibular Joint Lavage

Temporomandibular joint (TMJ) disorders are common clinical conditions with a multifactorial etiology that affect the functional integrity of the masticatory system. In cases where conservative treatment fails to achieve satisfactory improvement, TMJ lavage (arthrocentesis) emerges as an effective and minimally invasive treatment option. Arthrocentesis is based on the principle of irrigating the superior joint space with physiological saline or lactated Ringer's solution. The procedure aims to remove inflammatory mediators, reduce intra-articular pressure, and mechanically release adhesions within the joint. Clinical success is closely associated with appropriate case selection, a thorough understanding of TMJ anatomy, correct needle insertion angles, and adequate lavage volume. Clinical observations and data from the literature indicate that TMJ lavage provides high success rates in reducing pain and improving mouth opening, particularly in early-stage internal derangements. Furthermore, combining lavage with intra-articular injections (such as hyaluronic acid or corticosteroids) may enhance long-term symptom control. The purpose of this presentation is to share clinical tips for improving the success of TMJ lavage procedures and to present practical recommendations based on current evidence in the literature.



TAM METİN E-POSTERLER

EP-005

Sekonder Damak Yarığının Two Flap Palatoplasty tekniği ile Onarımı: Olgu Sunumu GirişHalil İbrahim Durmuş, Ümit Solmaz, Kağan Fatih Kuşan

Adiyaman Üniversitesi, Ağız, Diş ve Çene cerrahisi Ana Bilim Dalı, Adiyaman

Dudak ve damak yarıkları, yüz ve ağız boşluğunu etkileyen en yaygın doğumsal anomaliler arasındadır. Bu durum, dudak ve damak dokularının fetal gelişimin erken dönemlerinde kaynaşmaması sonucu meydana gelir. Orofasiyal bölgede meydana gelen yarıklar genellikle dudak, alveol, sert damak ve yumuşak damağı etkiler. Damak yarığı, maksiller çıktılarının palatinal raflarının füzyonunun başarısız olması nedeniyle oluşur ve sert ve/veya yumuşak damak yarıklarına neden olur.

Dudak ve damak yarıkları ayrıca diğer konjenital anomalilerle de ilişkili olabilir ve genetik bir sendromun parçası olabilir. Yapılan çalışmalarla, 250'den fazla sendromda yarık dudak ve damak olguları bildirilmiştir. Günümüzde yapılan araştırmalara göre, yarık damak eşlik etsin ya da etmesin, olguların yaklaşık %70'i nonsendromik, %30'u ise sendromik olarak izlenmektedir.

Bu vakamızda sistemik olarak sağlıklı doğuştan sekonder damak yarığı(Veau Sınıf 2) ve oronazal ilişkisi bulunan hastamızın uygun kilo ve zamanı gelince genel anestezi altında damak yarığı onarımını gerçekleştirdik. Ayrıca kullanımı çok tercih edilmeyen ancak gün geçtikçe yaygınlaşan lateral bölgedeki sekonder iyileşmeye bırakılacak alanları bilateral Bichat yağ dokusu ile kapatıp post operatif dönemde daha sağlıklı ve konforlu bir iyileşmeyi amaçladık. Buccal yağ dokusu, merkezi bir gövde ve bukkal, pterigoid, pterigopalatin ve temporal olmak üzere dört çıktıdan oluşan kapsüllenmiş bir yağ dokusu topluluğudur. Ağız rekonstrüksiyonunda kullanımı ilk olarak Egyedi tarafından bildirilmiştir. Tiedman ve arkadaşları tarafından, intraoral olarak kullanıldığından epitelizasyon yeteneğine sahip olduğu için deri grefti kaplaması gerektirmemiştir. Saplı greft olarak kullanımının yanı sıra, yüzün estetik cerrahisinde de önem kazanmıştır.

Vaka Sunumu

Sistemik olarak sağlıklı 9 aylık kız çocuğu hastamıza genel anestezi altında oral entübasyon sağlandı. Onarımı gerçekleştirmek için Bardach tarafından tanımlanın 'two flap palatoplasty' tekniğini uyguladık. Bu teknikle yarık boyunca her iki taraftan mukoperiostal flepler kaldırıldı ve orta hattaki defekt, bu iki flebin karşılıklı olarak ilerletilmesiyle kapatıldı.

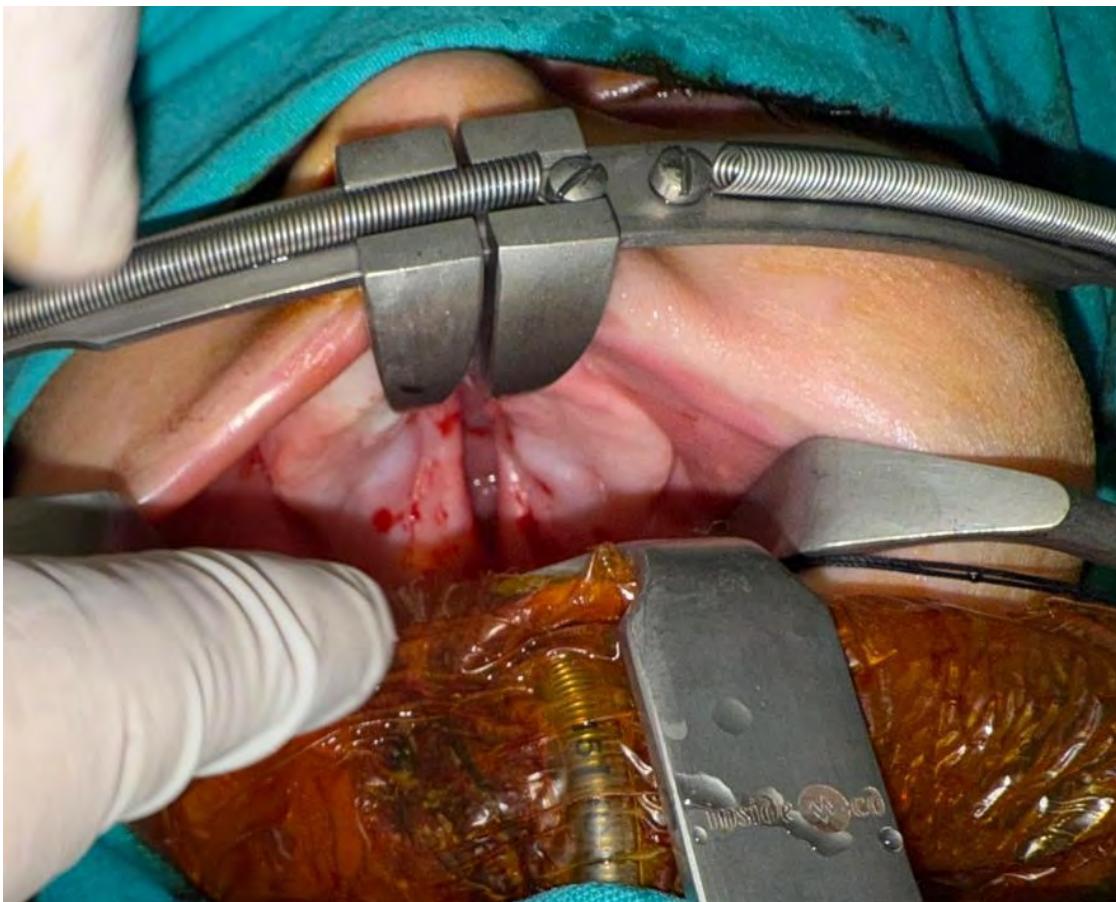
Yarığın kenarlarından, alveoler kretin arkasına doğru uzanan iki uzunlamasına insizyon yapıldı, sert damağın her iki yanından mukoperiostal flepler, nazal mukozaya zarar vermeden kaldırıldı, önce nazal mukozadan oluşan tabaka dikilerek nazal taban oluşturuldu, daha sonra oral mukoperiostal flepler orta hatta ilerletilerek damak defekti kapatıldı. Fleplerin gerilimsiz bir şekilde kapatılması, yara açılmasını ve fistül oluşumunu önlemek açısından oldukça önemlidir. Alveol kenarlarda sekonder iyileşmeye bırakılan alanlarda, hastanın konforunu artırmak ve postoperatif dönemde daha sağlıklı bir iyileşme sağlamak amacıyla, bilateral buccal fat pad (Bichat) yağ dokusu diseksiyonla ortaya çıkarıldı ve lateral bölgelere süture edildi. Sonrasında hasta ekstübe edilerek yenidoğan yoğun bakım servisine alındı.

Sonuç

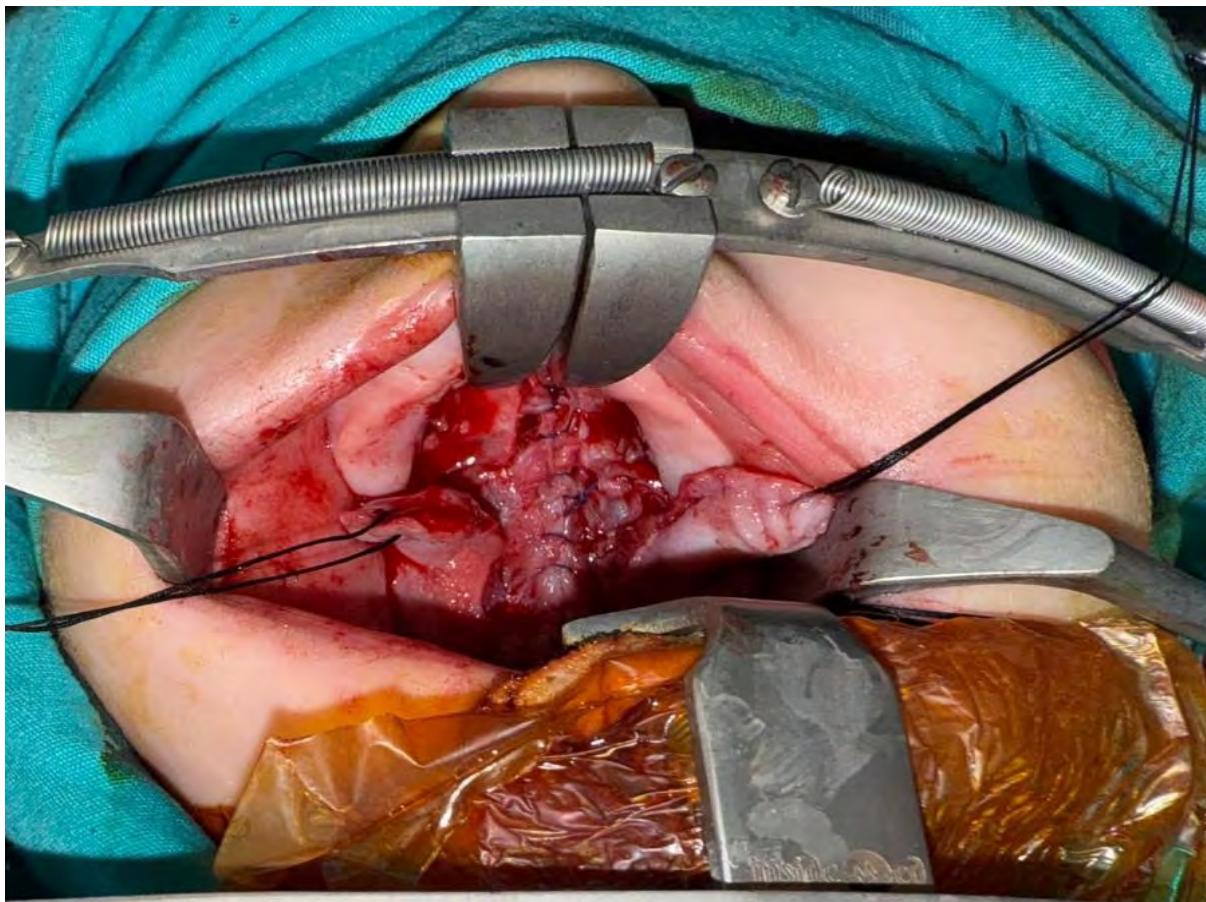
Gerekli analjezik ve antibiyotikler reçete edildi. Ameliyat sonrası operasyon bölgesinin antimikrobiyal solüsyon ile temizliği ebeveynlere anlatıldı. Hastanın ilk 24 saat sıvı diyet ve sonrasında püre kıvamında yumuşak ilk beslenmesi gerektiği anlatıldı. Yara bölgesine el, dil veya oyuncakla temas etmemesi gerektiği anlatıldı. Biberon ucu veya kaşık kullanılırken dikkatli olunması gerektiği ve besleme sırasında bu araçların damağa temas etmemesi gerektiği vurgulandı. Ayrıca, özellikle ilk günlerde mümkün olduğunda kaşıkla besleme yapılmasının uygun olacağı, negatif basınç yara bölgesindeki pihtının stabilizasyonunu bozacağı için herhangi bir emme hareketinin oluşturacağı bu basıncın önlenmesinin önemli olduğu belirtildi.

Hastamıza yaptığımız operasyon sonrasında oronazal ilişki nedeniyle yaşanan beslenme sorunu ortadan kaldırıldı. Hasta ameliyat sonrası 1.hafta, 2.hafta ve 4.hafta kontrollerine çağrıldı. Ameliyat sonrası 2.Haftada süturlar alındı, operasyon bölgesinde herhangi bir enfeksiyon, fistül ve sütur hattında dehisens

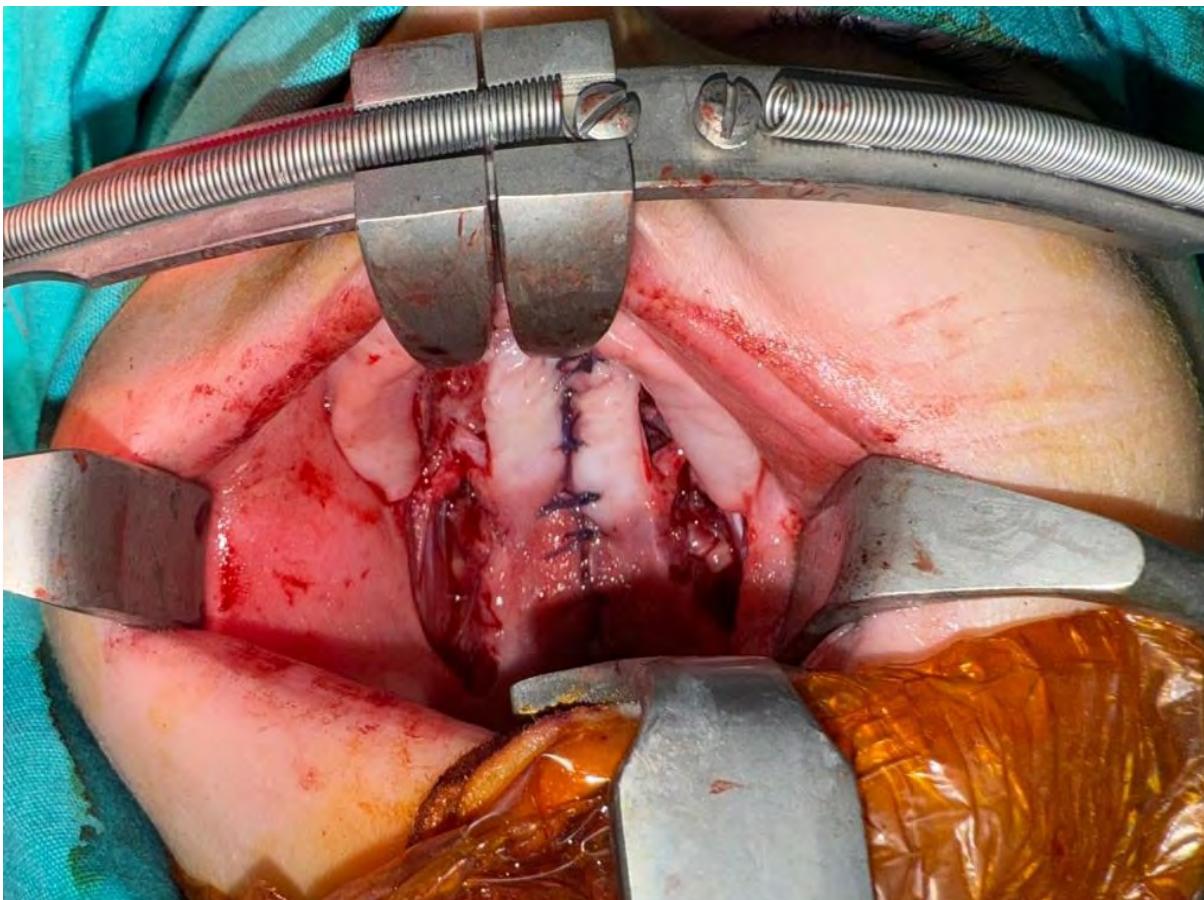
bulgusuna rastlanmadı. Ameliyat sonrası 6-8. haftalarda logopedik değerlendirme ve aynı zamanda velofaringeal yetersizlikten dolayı dil, konuşma terapistine yönlendirildi.



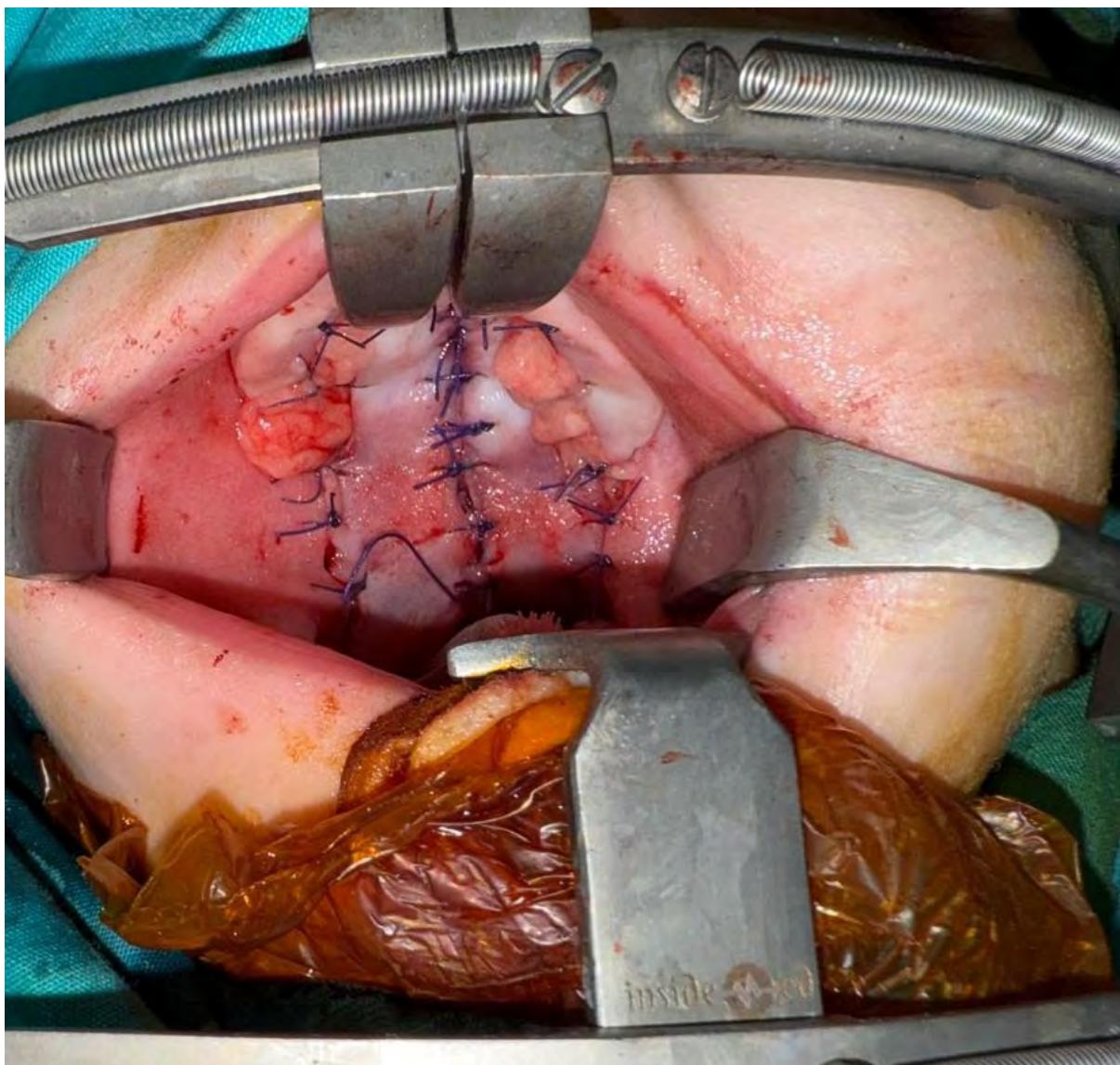
Resim 1: Preoperatif görünüm



Resim 2: Two flap palatoplasty tekniğinde anterior flebin kaldırılması ve nazal mukozanın oluşturulması



Resim 3: Her iki taraftan kaldırılan mukoperiostal fleplerin gerilimsiz bir şekilde orta hatta suture edilmesi



Resim 4: Alveol kret kısmındaki flepler suture edildi. Sekonder iyileşmeye bırakılacak alanlar bilateral bichat yağ dokusu ile kapatılarak daha iyi bir iyileşme amaçlandı.

EP-008

**"RECONSTRUCTION OF A LARGE MAXILLARY DEFECT AFTER RADICULAR CYST SURGERY
USING A COLLAGEN-ENRICHED XENOGENEIC BLOCK GRAFT: A CASE REPORT"**

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Abstract

Objective: Odontogenic cysts are pathological lesions characterized by epithelial lining and fluid-filled cavities. These cysts can lead to expansion of the jawbone and invasion of adjacent tissues. While bone repair and healing can occur after surgical treatment, additional augmentation procedures may be necessary before prosthetic rehabilitation. This case report details the surgical management of a maxillary radicular cyst and the subsequent augmentation of the resulting defect using xenogeneic block grafts.

Case: A 42-year-old male patient presented to our clinic with swelling in the maxillary region. Clinical examination revealed crepitation, and aspiration of the lesion yielded yellowish cystic fluid. Cone beam computed tomography (CBCT) demonstrated a large cystic lesion extending from teeth 11 to 16, invading the maxillary sinus. The lesion was surgically enucleated, and histopathological examination confirmed the diagnosis of a radicular cyst through findings of cystic epithelium and inflammatory cells. Six months postoperatively, the patient returned requesting implant treatment. Due to inadequate bone volume and a significant posterior defect, guided bone regeneration was planned prior to implant placement. Two xenogeneic block grafts (measuring 3 × 15 × 25 mm) were secured to the alveolar crest with screws, and the gaps surrounding the blocks were filled with xenogeneic particulate grafts. The horizontal augmentation site was covered with a collagen and concentrated growth factor (CGF) membranes. No postoperative complications were observed, and healing progressed uneventfully. Postoperative CBCT imaging indicated new bone formation, achieving approximately 3.79–4.09 mm of horizontal bone gain.

Conclusion: This case serves as a reassuring demonstration of successful tissue regeneration prior to implant placement using xenogeneic block grafts, resulting in adequate bone volume for implant surgery. The use of CGF membranes appeared to enhance soft tissue healing and reduce postoperative complications. Further clinical studies are needed to evaluate the long-term outcomes of this treatment approach.

Keywords: Radicular cyst; Augmentation; Xenogeneic block graft; Concentrated growth factor

1. Introduction

Radicular cysts are among the most commonly encountered pathologies within odontogenic cysts. Although they are often asymptomatic, when they grow to significant sizes, they can lead to cortical bone destruction, maxillary sinus perforation, and severe alveolar bone loss. In these cases, reconstructing the substantial defects that arise after surgical enucleation is essential for both functional and aesthetic reasons.

For many years, autogenous bone grafts have been regarded as the gold standard for bone regeneration. However, their limited availability, potential donor site complications, and unpredictable resorption rates have led to the exploration of alternative graft materials.(1) In this context, xenogeneic block grafts—especially those enriched with collagen—have gained popularity in clinical applications.

Furthermore, autologous biological products such as Concentrated Growth Factor (CGF) have emerged as valuable adjuncts in regenerative surgery. The growth factors found in CGF enhance angiogenesis, accelerate graft vascularization, and promote bone healing. Research indicates that combining xenogeneic block and particulate grafts with CGF can reduce complication rates and facilitate quicker, more stable bone regeneration.

This case report outlines the surgical treatment of a radicular cyst and the reconstruction of the significant maxillary defect that resulted. It highlights the guided bone regeneration process, the adjunctive regenerative materials utilized, and the short-term clinical outcomes achieved.

2. Case Report

A 42-year-old male patient, who was systemically healthy, presented to our department with a complaint of swelling in the maxillary region. Clinical examination revealed swelling in both the extraoral and intraoral areas, crepitus upon palpation, and a yellowish cystic fluid upon aspiration. Panoramic and cone beam computed tomography (CBCT) scans showed a large lesion extending between teeth 11 and 16, appearing radiolucent with radiopaque borders and invading the maxillary sinus. This lesion was provisionally diagnosed as a radicular cyst.

Surgical enucleation was planned, and the cystic lesion was completely excised. Histopathological examination confirmed the diagnosis of a radicular cyst, showing cystic epithelium and inflammatory cells. The postoperative healing period was uneventful.

At the six-month postoperative follow-up, the patient returned requesting implant treatment. CBCT imaging revealed insufficient bone volume in the affected region for implant placement. Guided bone regeneration was planned prior to implant placement.

In the day of surgery, two xenogeneic block grafts (measuring 3×15×25 mm) were fixed to the alveolar ridge using eight titanium screws, and the spaces around the blocks were filled with xenogeneic particulate grafts. The horizontal augmentation site was further supported with a collagen and CGF membranes.

No peri- or post-operative complications were noted. Follow-up CBCT imaging indicated new bone formation, with approximately 3.79–4.09 mm of horizontal bone gain achieved.

3. Discussion

Several studies have shown that xenogeneic block grafts can serve as a viable alternative to autogenous blocks, with comparable graft survival rates.(2,3) Meta-analyses indicate that xenogeneic blocks experience lower resorption rates than autogenous grafts while still providing adequate bone volume for implant placement.(4) Additionally, xenogeneic blocks that contain collagen enhance mechanical stability, offer membrane support, and contribute to contour preservation.(5,6)

In a study conducted by Marques et al.,(7) the xenogeneic block group achieved approximately 4.2 mm of horizontal bone gain, compared to about 3 mm in the autogenous graft group. The level of resorption was similar for both groups, showing no statistically significant difference. In terms of bone density, xenogeneic blocks initially displayed lower Hounsfield Units (HU) values; however, after 8 months, they exhibited a 29% increase, leading to a greater gain in density relative to autogenous blocks. No complications, such as block exposure or failed integration, were reported in either group during clinical follow-up.

In the study by Labrador et al.,(8) autogenous blocks demonstrated denser new bone formation, while xenogeneic blocks were associated with a higher amount of residual graft particles. However, the authors noted that xenogeneic blocks pose lower risks for postoperative complications and eliminate donor site morbidity, which is a significant advantage. Similarly, Liu et al.(9) reported that the percentage of vital mineralized bone in xenogeneic blocks ranged from 11% to 30%, while their resorption rates ranged from 7% to 21%.

These findings suggest that xenogeneic blocks can provide sufficient bone volume, although they may exhibit lower biological integration compared to autogenous blocks. Randomized clinical trials have emphasized that the horizontal bone gain achieved with xenogeneic blocks is comparable to, and in some cases even exceeds, that of autogenous blocks.(1,10) Nevertheless, it is important to evaluate them carefully, as they may yield more limited results than autogenous grafts, particularly regarding implant

survival.(9) Long-term clinical data will be essential in clarifying the reliability of these materials for various indications.

In our case, postoperative cone beam computed tomography revealed approximately 3.79 to 4.09 mm of horizontal new bone gain. However, we could not provide implant-related data such as primary stability, implant survival, and peri-implant bone continuity.

4. Conclusion

Reconstructing significant bone defects that occur after oral cyst surgery presents a considerable clinical challenge, particularly in achieving adequate volume for subsequent implant therapy. In our case, a radicular cyst that invaded the maxillary sinus was treated, and we performed horizontal augmentation in the affected region using guided bone regeneration, which led to successful bone gain. This approach aligns with current literature findings. We utilized CGF as an adjunctive material during treatment, and its use appeared to enhance soft tissue healing and reduce complications in the postoperative period. Further clinical studies are necessary to assess implant survival and the long-term volumetric stability of the augmentation.

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6. Figures



Figure 1: Radicular cyst; preoperative radiography



Figure 2: Intraoral photographs of enucleation surgery



Figure 3: Postoperative radiography at three-month following surgery

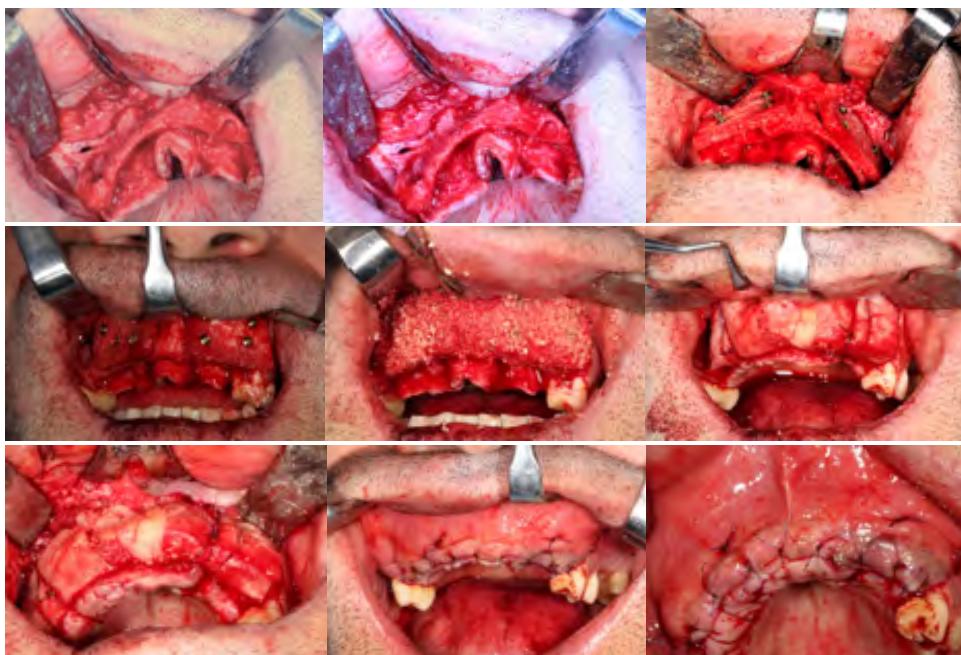


Figure 4: Intraoral photographs of horizontal bone augmentation surgery



Figure 5: Concentrated growth factor (CGF), collagen-enriched xenogeneic block graft, particulate xenogeneic bone graft



Figure 6: Postoperative radiography following surgery

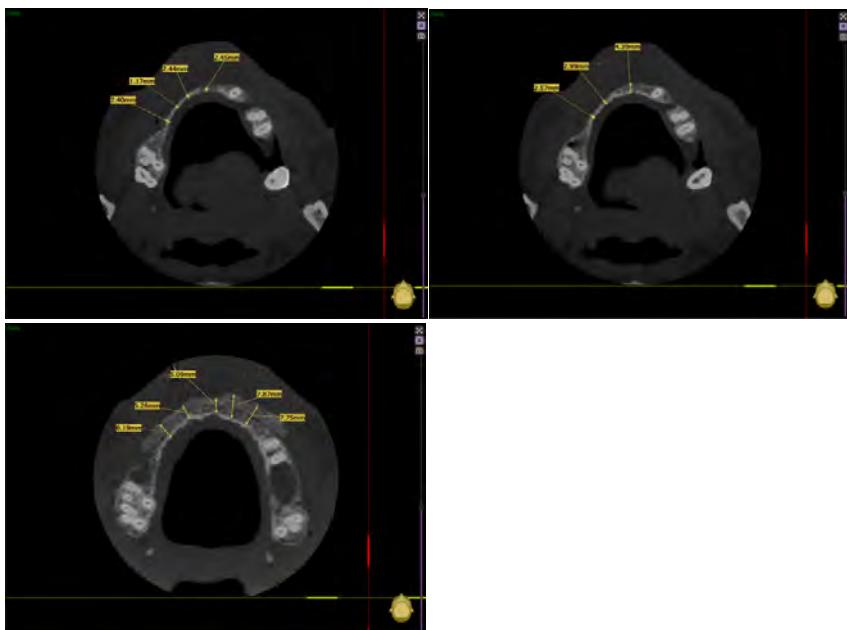


Figure 6: Postoperative CBCT view; axial section

EP-012

**RADİKÜLER KİST İLE İLİŞKİLİ MANDİBULAR BİRİNCİ MOLARIN, ÜÇÜNCÜ MOLAR
OTOTRANSPLANTASYONU İLE TEDAVİSİ: OLGU SUNUMU VE LİTERATÜR DERLEMESİ****Abstract**

Objectives: Tooth autotransplantation is a procedure in which a suitable donor tooth is transferred to a recipient site to replace a lost tooth. This method may reduce the need for prosthetic rehabilitation, eliminate complex orthodontic space closure, and provide advantages in terms of treatment time, cost, esthetics, and biological compatibility.

Case report: A 25-year-old female patient was referred to our clinic after a routine radiographic examination revealed a cystic lesion associated with the mandibular left first molar. Extraction of the tooth and enucleation of the cyst were initially planned. However, considering the patient's young age and the extent of bone loss that would compromise implant placement, autotransplantation of the mandibular third molar was selected as an alternative treatment. The third molar was deemed a suitable donor due to its favorable morphology, healthy structure, incomplete root formation, and the patient's age. Following extraction of the affected tooth and cyst enucleation, the third molar was atraumatically removed and transplanted into the recipient site. To ensure stability, a flexible splint was applied to adjacent teeth. Endodontic treatment was initiated in the second week post-transplantation. The patient was recalled at 3, 6, and 9 months. Radiographic evaluation confirmed bone regeneration at the lesion site, and clinical and radiographic findings indicated that the transplanted tooth maintained its function successfully.

Conclusion: Although dental implants are widely used today, autotransplantation remains a valuable option in selected cases. Treatment success depends on proper patient selection, the availability of a suitable donor tooth, and the condition of the recipient site.

Key words: Autotransplantation, Impacted tooth, Radicular cyst

1. Introduction

Tooth autotransplantation is defined as the surgical repositioning of a tooth from one location in the oral cavity to another site in the same individual. First introduced into clinical practice several decades ago, this treatment modality has gained renewed interest as a biologically favorable option for replacing lost teeth in selected cases. Although the widespread use of osseointegrated dental implants has largely overshadowed autotransplantation in recent years, it remains a valuable and predictable alternative under specific clinical circumstances [1,2].

Indications for autotransplantation include congenitally missing teeth, traumatic tooth loss, and extraction of teeth associated with pathological lesions such as radicular cysts [3,4]. Compared to prosthetic rehabilitation or implants, autotransplantation offers several advantages: preservation of natural periodontal ligament, maintenance of alveolar bone through functional loading, lower cost, and reduced treatment time. Moreover, it provides the unique benefit of continued eruption and adaptation of the transplanted tooth, which is especially relevant in growing patients where implants may be contraindicated [1,5].

The success of autotransplantation depends on several critical factors. These include careful patient selection, the availability of a suitable donor tooth—preferably with incomplete root formation and favorable morphology—an infection-free recipient site with adequate bone support, and the use of atraumatic surgical techniques that minimize extra-alveolar time [2,6]. Adjunctive measures such as flexible splinting and appropriately timed endodontic treatment further improve prognosis. Long-term studies have reported survival and success rates that are comparable to dental implants when these parameters are respected [6,4].

In the present case, we describe the autotransplantation of a mandibular third molar to replace a first molar tooth associated with a radicular cyst. Due to the extent of bone loss and the patient's young age, conventional implant therapy was not feasible. This report highlights the clinical decision-making process,

surgical management, and favorable outcomes that demonstrate the continued relevance of tooth autotransplantation in modern dental practice.

2. Case Report

A 25-year-old female was referred to our clinic after a routine radiographic examination revealed a well-defined radiolucent lesion associated with the mandibular left first molar (Figure 1). Clinical examination showed mild swelling and caries in the involved tooth. The lesion was diagnosed as a radicular cyst. The initial treatment plan included extraction of the affected molar and cyst enucleation. However, due to the patient's young age and the expected bone loss that would compromise implant placement, autotransplantation of the mandibular third molar was chosen as an alternative. The donor tooth was considered suitable because of its favorable morphology, healthy structure, and incomplete root formation. Under local anesthesia, the mandibular first molar was extracted and the cyst was enucleated (Figure 2). The mandibular third molar was atraumatically removed and immediately transplanted into the prepared socket (Figure 3). A flexible splint was applied for stabilization (Figure 4). Endodontic treatment was started in the second postoperative week.

The patient was followed up at 3, 6, and 9 months (Figure 5). Clinical and radiographic examinations revealed progressive bone regeneration in the defect area (Figure 6), with no signs of infection, ankylosis, or root resorption. At the last follow-up, the transplanted tooth remained functional and stable in occlusion. This case demonstrates that third molar autotransplantation can provide a successful treatment option for radicular cyst-associated defects in young patients.

3. Discussion

Tooth autotransplantation is a biologically sound method that can restore both function and esthetics in selected clinical situations. Although the popularity of dental implants has reduced its routine use, several studies have confirmed that autotransplantation remains a valuable option, particularly in young patients with specific anatomical or pathological challenges [1,2].

One of the main advantages of autotransplantation is the preservation of the periodontal ligament, which allows continued proprioception and physiological tooth mobility, unlike implants [3]. This contributes to alveolar bone maintenance through functional loading and offers long-term stability. In addition, autotransplantation is associated with reduced treatment time and cost compared to prosthetic rehabilitation or implant placement [4].

The prognosis of autotransplanted teeth largely depends on case selection and surgical technique. The use of donor teeth with incomplete root formation has been shown to improve pulp revascularization and periodontal healing [1,5]. In our case, the mandibular third molar was selected due to its favorable morphology and open apex, in accordance with these criteria. Moreover, atraumatic extraction and minimal extra-alveolar time are emphasized as critical factors for success [2]. Flexible splinting was performed to stabilize the transplanted tooth, consistent with recommendations in the literature [6]. Radicular cyst-associated defects present an additional challenge due to the loss of alveolar bone. Previous reports have demonstrated that autotransplantation can not only restore function but also support bone regeneration at cystic defect sites [7]. In our patient, follow-up radiographs confirmed progressive bone fill, consistent with these findings.

Systematic reviews have shown survival rates of 80–95% for autotransplanted teeth, with outcomes comparable to dental implants when proper protocols are followed [4,5]. In this context, the present case demonstrates that third molar autotransplantation can be a predictable and biologically favorable option in managing mandibular radicular cysts in young patients, particularly when implant therapy is not feasible.

4. Conclusion

This case demonstrates that third molar autotransplantation can be a reliable treatment alternative in young patients with radicular cyst-associated mandibular molar defects where implant therapy is not feasible. Proper case selection, careful surgical technique, and appropriate postoperative management

are essential for long-term success. Autotransplantation should therefore be considered as a biologically favorable option to restore both function and esthetics in selected cases.

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5. Figures



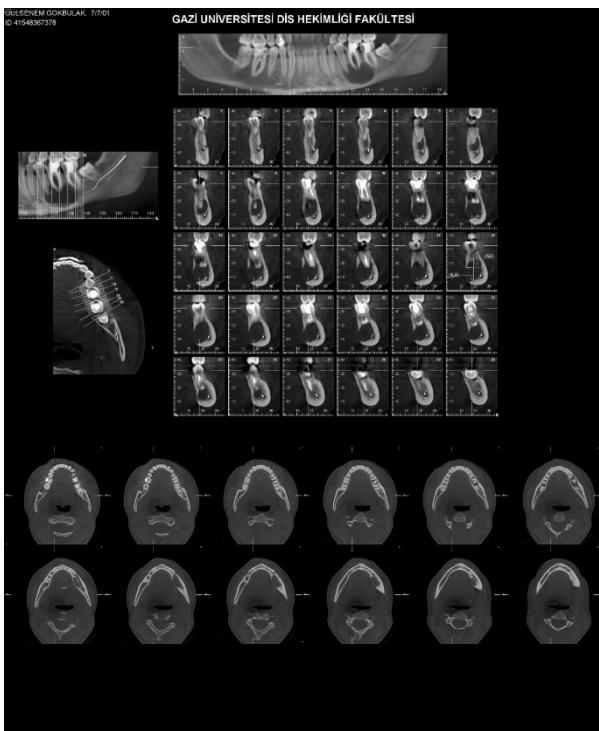


Figure 1: CBCT and Panoramic view of the lesion



Figure 2: Extraction socket and expose of the donor tooth

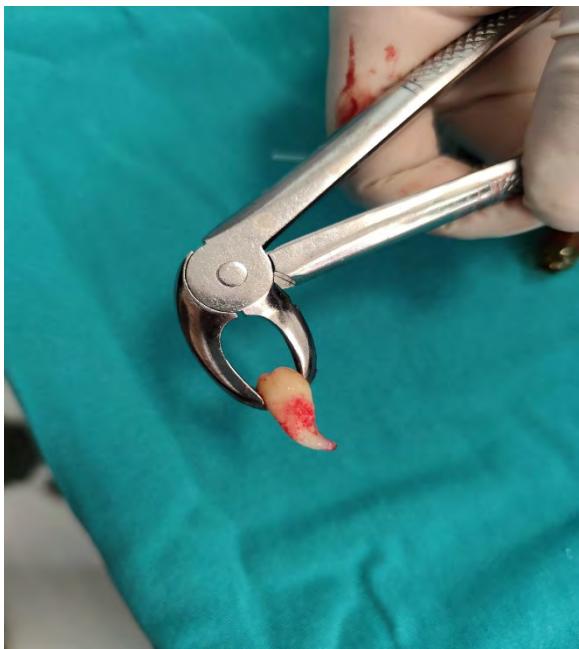


Figure 3: Donor tooth extraction



Figure 4: Reimplantation and splinting of the donor tooth



Figure 5: post operative panoramik image

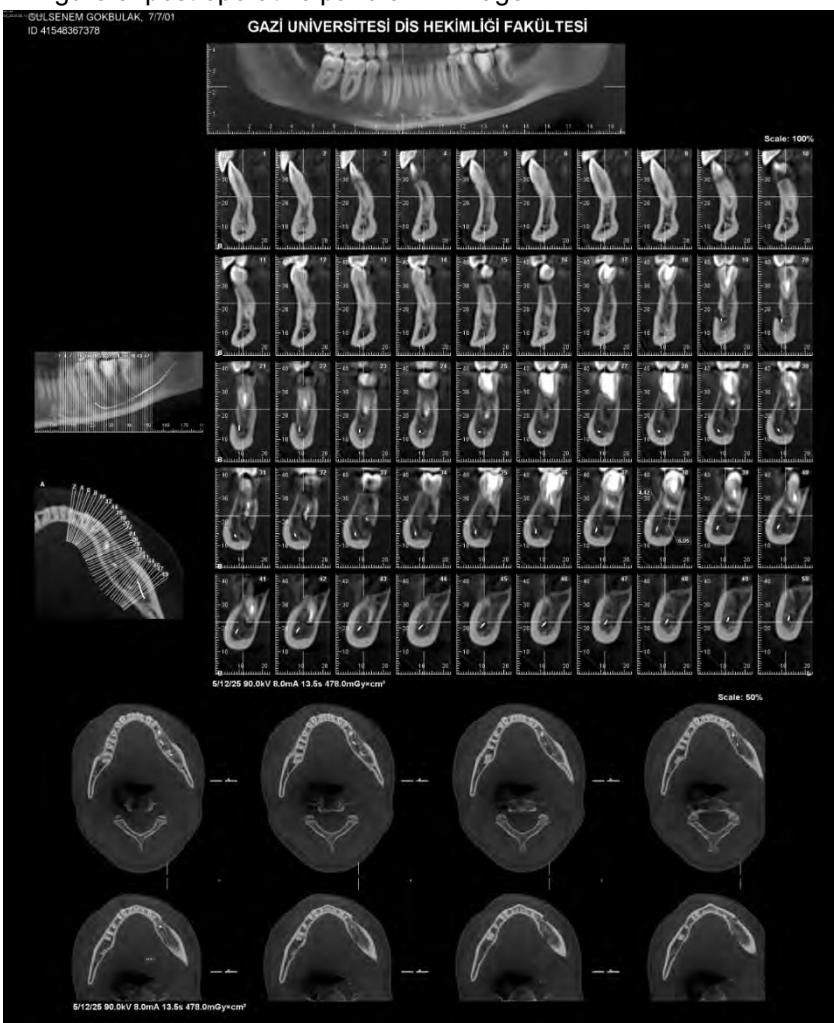


Figure 6: post operative sixth month CBCT image

EP-28

**Fokal Semento-Osseöz Displazi İle İlişkili Derin Gömülü 20 Yaş Dişin Bukkal Kortikotomi Yöntemi
İle Tedavisi: Olgu Raporu**
Hadi Nasrollahi, Bahar Maide Kösen, Sezai Çiftçi

Giriş: Bukkal kortikotomi tekniği, günümüzde derin gömülü mandibular dişlerin çekiminde ve bu dişlerle ilişkili patolojik lezyonların enüklasyonunda tercih edilen cerrahi yöntemlerden biridir. Bu yaklaşımın başlıca avantajları arasında, minimal kemik kaybı sağlama ve postoperatif dönemde morbiditenin azaltılması sayılabilir.

Case report: 36 yaşındaki erkek hastada sol mandibulada gömülü 38 numaralı diş ve eşlik eden patolojik lezyon tespit edildi. Lezyon önce marsupializasyon ile küçültüldü, ardından bukkal kortikotomi tekniği ile diş çekimi ve lezyon enükleasyonu gerçekleştirildi.

Bukkal segment plak ve minivida ile fiksasyonu sağlanarak yerine adapte edildi; postoperatif dönemde herhangi bir komplikasyon gözlenmedi.

İkinci olgu, 47 ve 48 numaralı gömülü dişlerin çekimi için başvuran 20 yaşındaki erkek hastadır. Rotari motor yardımıyla bukkal osteotomi uygulanmış, kemik minivida ile bikortikal olarak fikse edildi ve postoperatif dönemde komplikasyon izlenmemiştir.

Conclusion: Bukkal kortikotomi tekniği, mandibular lezyon ve gömülü diş cerrahisinde kemik kaybını azaltıp postoperatif morbiditeyi düşürerek kemik yapısının korunmasını sağlar. Çalışmalar, piezoelektrik cihazla uygulandığında kemik defekti dolgu hacminde artış, daha düşük ağrı ve yüksek kemik kapağı entegrasyonu (%>90) göstererek yöntemin güvenli ve cerrahi sonucu iyileştirici olduğunu ortaya koymaktadır.

Anahtar kelime: Bukkal kortikotomi, gömülü üçüncü molar, enüklasyon

1. Introductin

Bukkal kortikotomi (bony lid) tekniği, çene kemiklerinde derin gömülü dişler ve kistik lezyonlar gibi durumların tedavisinde, inferior alveolar sinir (IAN) gibi kritik yapıları koruyarak ve kemik kaybını en aza indirerek cerrahi müdahaleyi daha güvenli hale getiren bir yaklaşımındır (1-3). Bu teknik, cerrahi alanı açığa çıkarmak için kemik plağının geçici olarak çıkarılıp işlem sonunda konumuna geri yerleştirilmesini sağlar (1,2). Piezocerrahi, yumuşak dokulara zarar vermeden kemiğe hassas kesimler yapma yeteneği sayesinde bu tekninin etkinliğini artırır. Repozisyon edilen kemik kapağın miniplak veya vidalarla stabilizasyonu, kemik iyileşmesini destekleyerek defekt miktarını geleneksel yöntemlere göre önemli ölçüde azaltır. Bu yöntem, zorlu vakalarda kontrollü ve kemik koruyucu sonuçlar sunar.(1, 2)

2. Case reports

2.1 CASE 1

36 yaşında, sistemik hastalığı bulunmayan erkek hasta, sol posterior mandibulada şişlik şikayeti ile kliniğimize başvurdu. Tomografik ve radyolojik incelemeler sonucunda gömülü 38 numaralı diş ve ona eşlik eden patolojik lezyon tespit edildi. Hastaya öncelikle marsupializasyon işlemi uygulandı ve 8 aylık takip süresince lezyon boyutunda azalma gözlandı. Takip sürecinin ardından, bukkal kortikotomi tekniği lokal anestezi altında piezocerrahi yardımı ile ilgili bölgede bukkal kemik pencere açıldı; gömülü diş çekildi ve eşlik eden patolojik lezyon enükle edildi. Bukkal segment tekrar yerine adapte edilerek plak ve minivida ile fiksasyonu sağlandı. Postoperatif dönemde herhangi bir komplikasyona rastlanmadı.

2.2 case2

20 yaşında, sistemik hastalığı bulunmayan erkek hasta, 47 ve 48 numaralı dişlerin cerrahi çekimi amacıyla kliniğimize başvurdu. Panoramik ve tomografik incelemeler sonucunda dişlerin mandibuler sinire yakın ve deviye pozisyonda olduğu saptandı. İlgili bölgeye lokal anestezi uygulanmasının ardından mukoperiostal flap kaldırılmış ve rotari motor yardımıyla bukkal osteotomi gerçekleştirılmıştır. Gömülü dişler atravmatik bir şekilde çekildikten sonra, bukkal kemik segmenti tek kortikal yapıda, 15 mm'lik minividalar kullanılarak plak uygulanmadan yerine fiksasyonu sağlanmıştır. Postoperatif dönemde hasta medikal tedavi uygulandı ve yedinci günde dikişler alındı. Birinci ay kontrolünde hasta değerlendirildi ve herhangi bir komplikasyon veya şikayetle rastlanmadı.

3. Discussion

Bukkal lid tekniği, mandibular üçüncü molar veya kistik lezyon cerrahisinde, bukkal kortikal kemiğin pencere şeklinde çıkarılması ve işlem sonrası yerine adaptasyonu ile doğal kemik yapısının korunmasını sağlar. Bu yaklaşım, kemik kaybını minimalize eder ve rejenerasyonu destekler (3). Teknik, özellikle inferior alveolar sinir (IAN) gibi kritik yapıları koruma ve kemik kaybını en aza indirme hedefleri doğrultusunda öne çıkmaktadır (2).

Her iki olguda da postoperatif dönemde iyileşme hızlı gerçekleşmiş; ancak konvansiyonel aletlerle kesim yapılan vakada (2. vaka) postoperatif ağrı, şişlik ve trismus, piezocerrahi kullanılan 1. vakaya göre daha fazla gözlenmiştir. Piezocerrahi, konvansiyonel tekniklere kıyasla daha hassas ve güvenli olmasına rağmen, işlem süresinin uzun olması gibi bazı dezavantajlara sahiptir. Abu Hawa ve arkadaşlarının çalışmasında piezocerrahi ile nadiren sinir hasarı rapor edilmiştir (3).

Kaynaklar, geleneksel döner aletlerin kemik kapağı oluşturmak için kullanılabileceğini belirtse de, piezocerrahiye kıyasla daha az kontrollü kesimler ve daha yüksek kemik kaybı riski taşıyabileceğini vurgulamaktadır (1,4). İkinci vakada, plak kullanılmadan 15 mm'lik minividalarla bikortikal fiksasyon sağlanması, operasyon süresi açısından avantajlımasına rağmen sinir hasarı riski açısından potansiyel bir durum oluşturmaktadır. Ancak yapılan vakada parestezi veya segment morbiditesi kontrol seanslarında gözlenmemiştir; bu durum, başarılı fiksasyon ve immobilizasyonun göstergesidir.

Oh ve arkadaşlarının çalışmasında, kemik kapak tekniği uygulanan 34 olgudan 12'sinde komplikasyonlar (enfeksiyon, ağrı, displazi) gözlenirken, fiksasyon yönteminin belirtilmediği bazı olgularda kemik kapağın yerleşiminde anormallikler rapor edilmiştir (2).

4. Conclusion

Bukkal lid tekniği, mandibular lezyon ve gömülü diş cerrahisinde kemik kaybını azaltarak ve postoperatif morbiditeyi düşürerek kemik yapısının korunmasını sağlar (2). Randomize kontrollü çalışmalarla, piezoelektrik cihazla uygulanan bukkal lid tekniğinde, operasyondan sonra altı aylık takipte kemik defekti dolgu hacminde anlamlı artış ve daha düşük ağrı düzeyleri gözlenmiştir (3). Bir diğer çalışmada, kemik kapağın entegrasyonu oldukça yüksek (%>90) olarak bildirilmiş ve major komplikasyonlar nadir görülmüştür (4). Bu veriler, bukkal lid tekniğinin uygun olgularda güvenli, konservatif ve cerrahi sonucu iyileştirici bir yöntem olduğunu güçlü şekilde desteklemektedir(2).

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6. Figures



Figurer 1. Lezyonun ve gömülü dişin radyolojik görüntüsü



Figure 2:bukkal kortikotomi sonrası

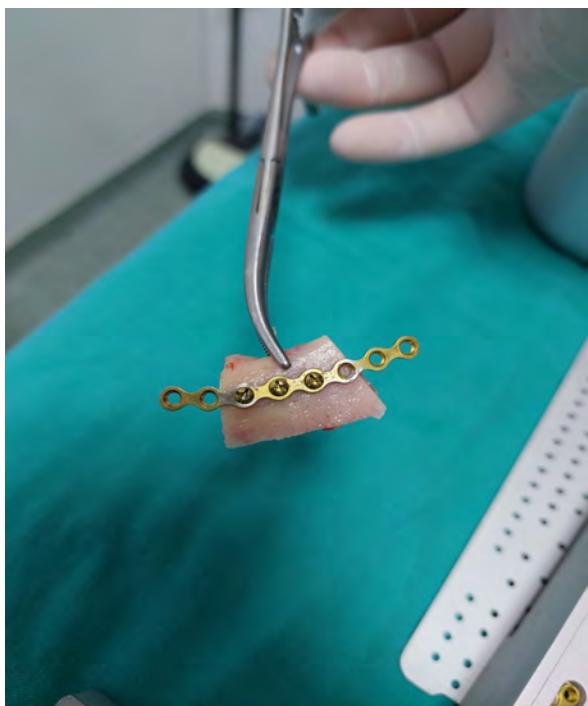


Figure 3: image of bone segment



Figure 4: fikse edilen parçanın son hali



Figure 5: operasyon sonrası segmentin fikse edilmiş hali

CASE 2:



Figure 1: radyolojik görüntü



Figure 2: bukkal osteotomi sonrası



Figure 3: kemiğin minividalarla fikse edilmiş hali



Figure 4: operasyon sonrası

EP-030

REMOVAL OF A MAXILLARY THIRD MOLAR DISPLACED INTO THE MAXILLARY SINUS DURING EXTRACTION VIA THE CALDWELL-LUC PROCEDURE: A CASE REPORTNur Muhammed DEMİR^a, Ömer Faruk BOYLU^a

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Abstract

Introduction: Extraction of third molars is one of the most common procedures in oral surgery. The literature reports a complication rate ranging from 2.6% to 30.9% following third molar extractions. Complications during extraction of maxillary third molars are less frequent compared to mandibular third molars. The most common complication associated with maxillary third molar extractions is oroantral communication, accounting for approximately 11% of all cases. Other complications include fracture of the maxillary tuberosity, root fracture, and partial or complete displacement of the tooth into the maxillary sinus. Published reports describe the surgical retrieval of teeth displaced into the sinus via the Caldwell-Luc approach or a buccal mucoperiosteal flap.

Case Report: A 30-year-old systemically healthy male patient presented to our clinic with a history of displacement of the upper right third molar into the maxillary sinus during extraction two years earlier. Clinical examination revealed no symptoms or signs of oroantral communication. Panoramic radiography and cone-beam computed tomography (CBCT) were used to determine the position of the tooth within the maxillary sinus. Under local anesthesia, an access window was created in the lateral wall of the maxillary sinus, and the tooth was surgically removed using a modified Caldwell-Luc approach. No postoperative complications were observed during follow-up.

Conclusion: The Caldwell-Luc procedure is an effective surgical option for managing complications related to the extraction of maxillary third molars.

Keywords: Third Molar, Complication, Caldwell-Luc Procedure

1. Introduction

Extraction of maxillary third molars is one of the most frequently performed procedures in oral and maxillofacial surgery clinics. Accidental displacement of a maxillary third molar into the maxillary sinus is a known complication of extraction and can lead to serious problems such as oroantral fistula, sinusitis, cellulitis, and even subdural empyema (1). Therefore, the surgeon must be capable of managing this complication. The position of a tooth displaced into the maxillary sinus is determined using various imaging techniques. Although some studies have suggested leaving the tooth in situ when there is no sinusitis or other local pathology, the preferred management is surgical removal (2). Surgical approaches include the alveolar approach (through the extraction socket) or the Caldwell-Luc approach (3).

2. Case Report

A 30-year-old systemically healthy male patient presented to our clinic with a history of accidental displacement of the right maxillary third molar into the maxillary sinus during extraction two years earlier. Clinical examination showed that the extraction site had healed uneventfully, with no signs of oroantral fistula. Panoramic radiography (Figure 1) and cone-beam computed tomography (CBCT) with multiple cross-sectional images (Figures 2–5) were used to localize the displaced tooth within the right maxillary sinus. Local anesthesia with epinephrine was administered via posterior superior alveolar, infraorbital, and greater palatine nerve blocks. A submarginal flap was raised from the mesial aspect of the maxillary second premolar to the distal aspect of the maxillary second molar. A bony window was created in the lateral wall of the maxillary sinus using a surgical bur (Figure 6). The region was irrigated copiously to mobilize the tooth, which was then removed together with surrounding fibrotic tissue using a long curved clamp (Figures 7–8). The surgical site was closed primarily with 4-0 silk sutures. A postoperative panoramic radiograph was obtained (Figure 9). Postoperative medications included amoxicillin/clavulanic acid (Augmentin BID 1 g), dextketoprofen trometamol (Arveles 25 mg), chlorhexidine mouthwash (Kloroben), and both topical and systemic decongestants. The patient received detailed postoperative

instructions regarding sinus care. At the 7-day follow-up, the surgical site was healing uneventfully and the sutures were removed. The patient attended follow-up visits at 1 month and 5 months postoperatively, during which clinical and radiological assessments confirmed complete healing (Figures 10–12).

3. Discussion

Displacement of a tooth or root fragment into the maxillary sinus during maxillary third molar extraction is a rare but potentially challenging complication, with a reported incidence of 0.6–3.8%, often accompanied by oroantral communication (4,5). In the present case, no oroantral communication was observed. Retained tooth or root fragments in the maxillary sinus can lead to serious complications such as acute or chronic sinusitis, antrolith formation, mucocele, or chronic inflammation, and should therefore be removed as soon as possible (6). Rothamel et al. (2006) reviewed 1,596 maxillary third molar extractions and reported only one case of displacement of the tooth into the maxillary sinus (7). Chongruk et al. (1989) reported that such complications occur more frequently with first molars and in male patients (8). In the present case, the displaced tooth was the right maxillary third molar in a 30-year-old male patient. Two-dimensional imaging is often insufficient for accurate localization of a displaced tooth within the sinus; therefore, three-dimensional imaging modalities such as CBCT or CT are recommended (9). In this case, in addition to panoramic radiography, dental volumetric tomography was used to determine the exact size, location, and mobility of the tooth in axial, sagittal, and coronal planes. Patient positioning during surgery may vary; however, due to the pyramidal shape of the sinus—its base being the medial wall and its apex extending to the zygomatic process of the maxilla—the supine position often provides better access and was therefore used in this case (10). In recent years, endoscopic removal of teeth, root fragments, or implants from the sinus has been reported (11,12). Endoscopic techniques allow removal through a small bone window (approximately 4 mm), provide direct visualization, and reduce the risk of damage to the infraorbital nerve or vessels (13). However, endoscopic removal typically requires general anesthesia, hospitalization, and a highly skilled surgical team. For these reasons, the Caldwell-Luc technique remains a practical and effective approach in routine clinical practice.

4. Conclusion

Given the clinical significance of the maxillary sinus in dental surgery, careful radiological evaluation and appropriate selection of surgical technique are critical for preventing complications. The Caldwell-Luc procedure is a safe and effective method for managing displaced teeth or root fragments within the maxillary sinus, with minimal postoperative discomfort and a low complication rate.

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6. Figures



Figure 1: Preoperative panoramic radiograph of the patient.



Figure 2: Preoperative dental volumetric tomographic images of the patient.



Figure 3: Sagittal section of the dental volumetric tomographic image.

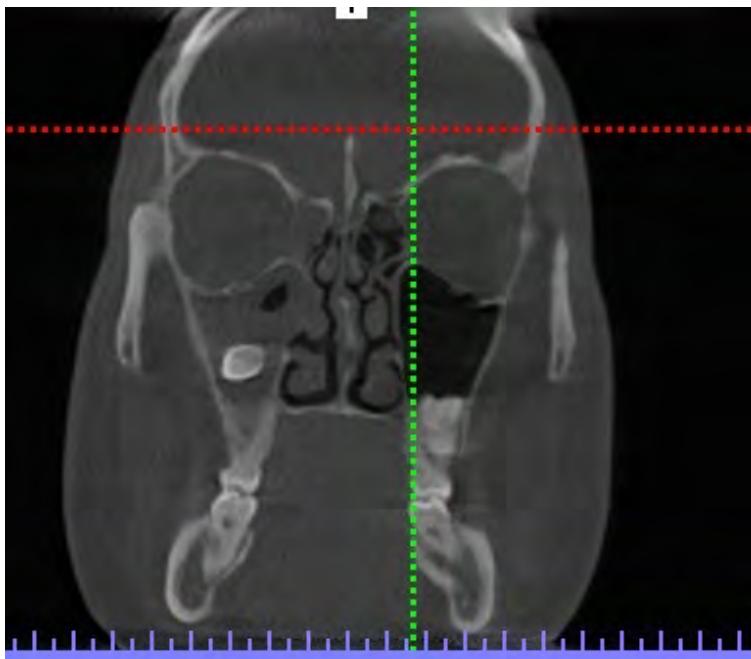
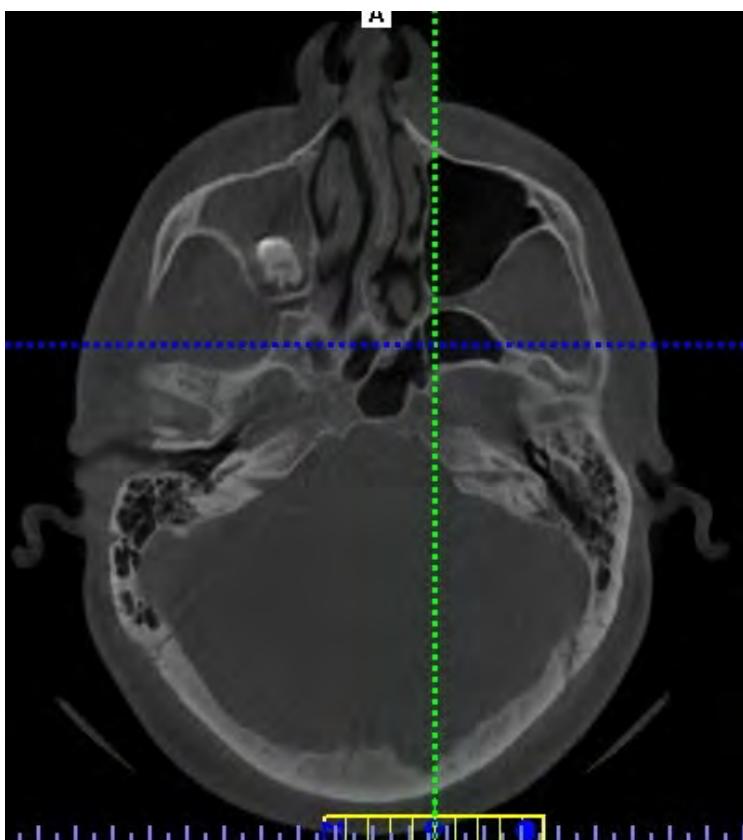


Figure 4: Coronal section of the dental volumetric tomographic image.



5. Axial section of the dental volumetric tomographic image.



Figure 6: Window created in the lateral wall of the right maxillary sinus using a surgical bur.



Figure 7: Removal of the tooth from the sinus using a long curved clamp.



Figure 8: The extracted upper right third molar removed from the maxillary sinus.



Figure 9: Postoperative control panoramic radiograph.



Figure 10: One-month follow-up panoramic radiograph of the patient.



Figure 11. Five-month follow-up radiograph of the patient.



Figure 12. Five-month intraoral follow-up photograph of the patient.

EP-042

CLOSURE OF AN OROANTRAL COMMUNICATION FOLLOWING TOOTH EXTRACTION USING THE BUCCAL FAT PAD: A CASE REPORTZehra Gülerol Aydin, Efe Berent AfacanBolu Abant Izzet Baysal University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery,
Boluzehra.gulerol@ibu.edu.tr**Abstract**

Objective: Oroantral communication is a pathological connection between the maxillary sinus and the oral cavity. It most commonly develops iatrogenically following extractions of maxillary molar and premolar teeth. If left untreated, it may lead to chronic sinusitis or the formation of an oroantral fistula. While small defects (<5 mm) may heal spontaneously, larger communications require surgical management.

Numerous techniques have been described in literature; among them, the buccal fat pad stands out as a reliable option, particularly for the closure of large defects.

Case Report: A 38-year-old female presented to our clinic for extraction of tooth #26, which was deemed non-restorable due to caries. During extraction, a perforation approximately 15 mm in diameter occurred in the floor of the maxillary sinus. The resulting oroantral communication (OAC) was closed using a pedicled buccal fat pad. Postoperative follow-up revealed no complications, infection, or fistula formation. The graft demonstrated rapid epithelialization, and complete closure of the defect was observed at 1 month.

Result: The buccal fat pad is a reliable, easy-to-apply technique with a high success rate for the management of oroantral communications and fistulas. This case supports the efficacy of the buccal fat pad particularly in closing large perforations. In clinical practice, teeth located in the posterior maxilla for which extraction is indicated based on radiographic evaluation should undergo detailed assessment of their relationship with the maxillary sinus; underscore highlights the importance of performing open surgical extraction for these teeth.

Keywords: Buccal fat pad, Oroantral communication, Maxillary sinus, Complication

1. Introduction

An oroantral communication (OAC) represents an abnormal passageway between the maxillary sinus and the oral cavity. It most frequently occurs as an iatrogenic complication after the extraction of maxillary premolars or molars (1). If not properly managed, this condition can progress to chronic sinusitis or develop into an oroantral fistula (2). Although small perforations measuring less than 5 mm may close spontaneously, larger defects generally necessitate surgical intervention (3). Numerous surgical techniques have been proposed in the literature, among which the buccal fat pad (BFP) flap is regarded as a dependable method, especially for the closure of extensive defects (4).

2. Case Report

A 38-year-old female patient presented to our clinic with a complaint regarding her upper left first molar (tooth no. 26), which exhibited extensive caries and structural damage that rendered it untreatable through restorative procedures. She had no systemic disease history. Preoperative clinical and radiographic evaluation revealed close proximity between the maxillary sinus floor and the tooth roots, as well as limited alveolar bone height (Figure 1,2 and 3).

During tooth extraction, due to the close relationship between the root apices and the sinus floor and the loss of buccal bone, an approximately 15-mm oroantral communication (OAC) occurred. Considering the size of the defect and the local anatomical characteristics, closure with a pedicled buccal fat pad (BFP) flap was chosen as the most suitable technique (Figure 4 and 5). Under local anesthesia, a buccal mucoperiosteal flap was elevated to expose the BFP, which was carefully mobilized without compromising its vascular supply. The pedicled fat pad was advanced over the OAC and secured with resorbable sutures under gentle tension. The area was then covered with a mucoperiosteal flap to minimize the risk of secondary dehiscence (Figure 6).

Postoperatively, the patient was prescribed antibiotics, analgesics, and nasal hygiene instructions. At the first-week follow-up, only mild edema and minimal hematoma were observed, with no signs of infection or wound dehiscence. By the second week, the graft appeared viable, well-vascularized, and showed rapid epithelialization. At the one-month clinical and radiographic evaluation, the OAC was completely closed, and no pathological connection between the sinus and oral cavity was detected. The patient reported no pain, infection, or fistula formation during the healing period. Functional and esthetic outcomes were satisfactory, with complete restoration of masticatory function and mucosal integrity.

This case demonstrates that the pedicled BFP is a reliable and effective technique for the closure of large (≥ 10 mm) oroantral communications, providing surgical convenience and a high success rate. Its rapid epithelialization potential and minimal donor-site morbidity contribute to optimal patient comfort and a shortened healing process.

3. Discussion

Oroantral fistula (OAF) is an epithelialized pathological connection between the oral cavity and the maxillary sinus, most commonly occurring after posterior maxillary tooth extractions or surgical procedures performed close to the sinus floor. Spontaneous closure is generally possible in defects smaller than 5 mm; however, larger openings require surgical intervention (5).

In this context, the use of the buccal fat pad (BFP) has been described in many studies as advantageous due to its high success rate, low recurrence risk, and minimal morbidity. For example, a systematic meta-analysis found that the BFP group showed significantly higher closure success compared to conventional buccal advancement or palatal rotation flap techniques (6). This finding suggests that the BFP can be considered a first-choice technique. Because of its anatomical proximity to the sinus floor, mobilization and pedicled transposition of the BFP are relatively straightforward (5). Furthermore, its rich vascularity supports graft viability and accelerates epithelialization (7). It also maintains vestibular depth, minimizing functional and prosthetic complications (8).

In cases of large oroantral fistulas (≥ 5 mm), the literature indicates that the success of traditional flap techniques decreases with increasing defect size, while BFP use remains consistently reliable (5). In patients with a history of failed local flap attempts or in cases where vestibular depth preservation is critical, one study emphasized that the BFP is a more logical choice. During graft mobilization, careful preservation of the pedicle is essential, as damage may lead to partial necrosis or graft failure (8). The surgeon's skill also plays a significant role—systematic studies have identified "operator expertise" as an important variable influencing outcomes (6). Some complications have been reported, such as hematoma, edema, or delayed wound healing; however, these are usually transient, and long-term success rates remain high (9).

In the present case, an approximately 15 mm oroantral communication was successfully closed using a pedicled BFP, with no recurrence, infection, or fistula formation observed during one-month follow-up. These findings are consistent with previously published high success rates in the literature. For instance, long-term studies have confirmed that pedicled BFPs provide effective and durable closure of large OAFs (10). Moreover, the low morbidity and satisfactory functional outcomes in this case further support the suitability of BFP for such defects.

Nonetheless, longer follow-up data (e.g., > 12 months) are still limited in the literature regarding recurrence and sinus health following BFP application. Future research should focus on evaluating variables such as defect volume, pre-existing sinus infection, and systemic health conditions that may influence treatment success. Additionally, studies exploring the relationship between BFP closure and subsequent prosthetic rehabilitation—particularly concerning vestibular depth and implant support—are warranted to strengthen the long-term evidence base.

4. Conclusion

Oroantral communications are among the most frequent complications following maxillary molar extractions. To minimize such risks, careful preoperative assessment, the use of atraumatic extraction techniques, root sectioning when necessary, and preservation of the buccal bone are essential. Proper surgical planning and gentle manipulation during tooth removal significantly reduce the likelihood of oroantral communication formation and promote favorable healing outcomes.

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6. Figures



Figure 1. The patient's panoramic radiograph



Figure 2. The patient's periapical radiograph

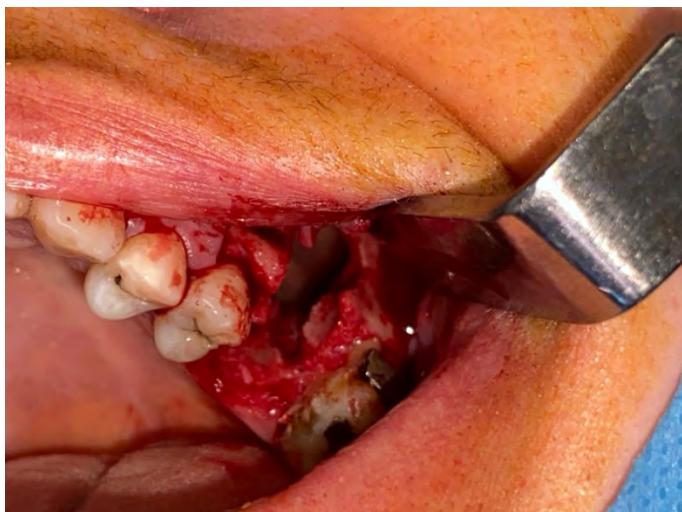


Figure 3. The post-extraction view of the socket

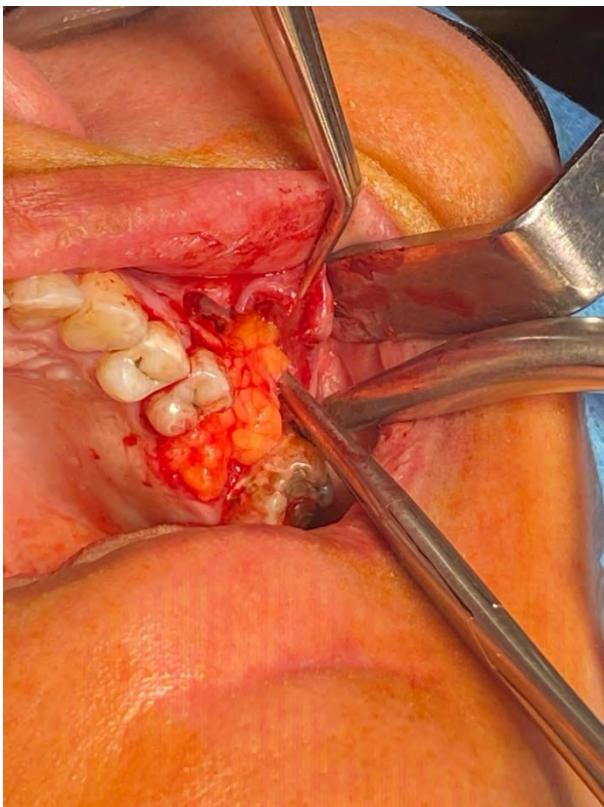


Figure 4. To achieve primary closure of the orofistula, the buccal fat pad was adapted and secured to cover the entire defect area.



Figure 5. Postoperative view after 1 month

EP-051

**ANATOMICAL REALITIES CHANGING OVER TIME: A CASE OF IMPLANT REVISION REQUIRED
DUE TO DEVELOPING APICAL LESION**Tutku Tekin Ayaz^a, Muharrem Ergun Dudak^b, Ayten Ozturk^c^a Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, tutku.tekin.ayaz@ege.edu.tr^b Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, mergundudak81@gmail.com^c Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, ayten.ozturk@ege.edu.tr**Abstract**

Objective: This case presents an example of complications that may arise from pathologies developing between clinical and radiological planning and implant surgery. The necessity of real-time evaluation of treatment planning is emphasized; otherwise, in case of an unfavorable development, the importance of revision treatment following CBCT evaluation is highlighted.

Case: In a 63-year-old systemically healthy male patient, insufficient vertical bone height was detected in the 24–26 region, and advanced sinus pneumatization was observed on CBCT. Instead of hard tissue augmentation, short implants were planned. However, in the surgery performed 6 months after planning, one of the implants placed in regions 24 and 26 deviated from the planned position during postoperative control and displaced into a 10 mm apical lesion associated with the apex of tooth 23. In the revision performed after endodontic treatment, the implant was atraumatically removed, the lesion was curetted, and a new implant was placed in the same region. In postoperative controls, the implant position was found to be consistent with the planning.

Conclusion: This case demonstrates that new pathologies that may develop between planning and surgical application can negatively affect implant stability. In cases with limited residual bone height in the posterior maxilla, reevaluation with updated CBCT and consideration of possible pathological changes are critically important in preventing complications. In revision surgery, atraumatic removal of the implant, excision of the lesion, and reimplantation in the same session constitute a safe and effective treatment approach.

Key words: Implant, CBCT, complication, migration

1. Introduction

Dental implants have become a reliable method providing functional and esthetic rehabilitation with high success rates in the treatment of partial and complete edentulism. However, implant surgery may encounter early or late complications due to multifactorial causes. One such complication, implant migration, is associated with anatomical and biomechanical factors such as limited residual bone height in the posterior maxilla, advanced sinus pneumatization, and inadequate primary stability (1,2). In the literature, cases have been reported where implants displaced into adjacent structures such as the maxillary sinus, nasal cavity, and rarely the nasal septum, and this condition has been noted to cause serious consequences such as sinusitis, septal abscess, and mucociliary dysfunction (3-5). Therefore, detailed clinical and radiological planning, especially evaluation of residual bone amount with updated CBCT, is critically important in preventing complications in implant treatments.

2. Case Report

In a systemically healthy 63-year-old male patient, panoramic radiography revealed limited vertical bone height in the region of teeth 24–26, and cone-beam computed tomography (CBCT) was requested for detailed imaging. CBCT revealed insufficient bone due to advanced maxillary sinus pneumatization (Figure 1). Instead of performing extensive hard tissue augmentation in the 24–26 region, short implants were planned. Due to the patient's specific reasons, after a 6-month delay, two NTA shorter implants (4.0 × 8 mm and 4.5 × 5 mm) were placed in regions 24 and 26 in proper positions. In the panoramic radiograph taken one week postoperatively (Figure 2), it was observed that the implant placed

in region 24 deviated from the planned position and projected at the apex level of tooth 23, and a confirming CBCT was taken. Postoperative CBCT (Figure 3) revealed a 10 mm apical radiolucent lesion associated with the apex of tooth 23, with the implant displaced into the lesion. Following endodontic consultation, tooth 23 was found to be devital and treated, and one month later the patient underwent revision surgery. The lesion, which had caused perforation of the buccal cortical bone, was curetted and the implant was atraumatically removed (Figures 4, 5, 6). Subsequently, an implant socket was prepared in the same region and a new implant was placed. In the postoperative panoramic radiograph taken one week later (Figure 7), the position of the implant in region 24 was found to be consistent with the second planning.

3. Discussion

This case draws attention to the clinical complications that may arise due to the time gap between planning and surgical application. In the literature, early and late implant failures are attributed to multifactorial causes including insufficient bone volume, lack of surgical experience, systemic diseases, smoking, peri-implant inflammation, and occlusal load imbalances (6-8). However, as in this case, a newly developed apical pathology within a short period affecting implant stability and displacing the implant into the apical lesion is a more rarely reported situation.

Implant migration is a rare but clinically significant complication in dental implantology. It most commonly occurs in the posterior maxilla due to insufficient residual bone height and advanced sinus pneumatization (1,7). Other factors facilitating migration include lack of primary stability, excessive occlusal forces, peri-implantitis, and inflammatory processes (3,4). Various cases have reported migration of implants into the maxillary sinus, nasal cavity, and even the nasal septum. Li et al. reported a rare case of migration into the nasal cavity, while Sousa Menezes et al. presented implant migration leading to septal abscess (3,4). Additionally, Sanchis et al. described a rare variant of the complication where a short implant placed at the floor of the nasal fossa was spontaneously expelled due to intranasal pressure changes (5). Furthermore, in a study by Damlar, it was reported that the implant disappeared through the ostium after migration into the maxillary sinus (2). All these cases show that pathological processes and anatomical factors may cause implants to advance toward adjacent structures along the path of least resistance. Galindo-Moreno et al. reported a significantly increased risk of implant migration in cases with residual bone height below 6 mm (1). Similarly, in the 25-year series by Hashemi et al., migration was observed in most patients with insufficient bone height (<5 mm) and without sinus lift application (7). In this case, although the required three-dimensional evaluations were performed and the residual bone amount was calculated, the time gap between planning and surgery was not considered, and an apical pathology that developed later in the adjacent tooth led to a reduction in residual bone amount and caused the implant to migrate into the lesion.

The primary goal in the treatment of implant migration is the safe removal of the displaced implant and prevention of complications. Treatment planning should consider implant localization, patient symptoms, and associated pathologies, and cases should be managed with a multidisciplinary approach. The approach applied in this case—atraumatic removal of the implant, curettage of the lesion, and reimplantation in the same session—is consistent with Levin's findings, which indicate that reimplantation in the same region after implant loss can be applied with high success rates (6). Moreover, this strategy provides clinical advantages in maintaining esthetic and functional outcomes.

4. Conclusion

Within the 6-month period between planning and surgical operation, pathologies may develop in adjacent teeth or implant-planned regions, leading the implant to displace into the cavity along the path of least resistance. In suitable cases, implant removal, lesion excision, and new implant placement, accompanied by CBCT evaluation, are safe and effective approaches.

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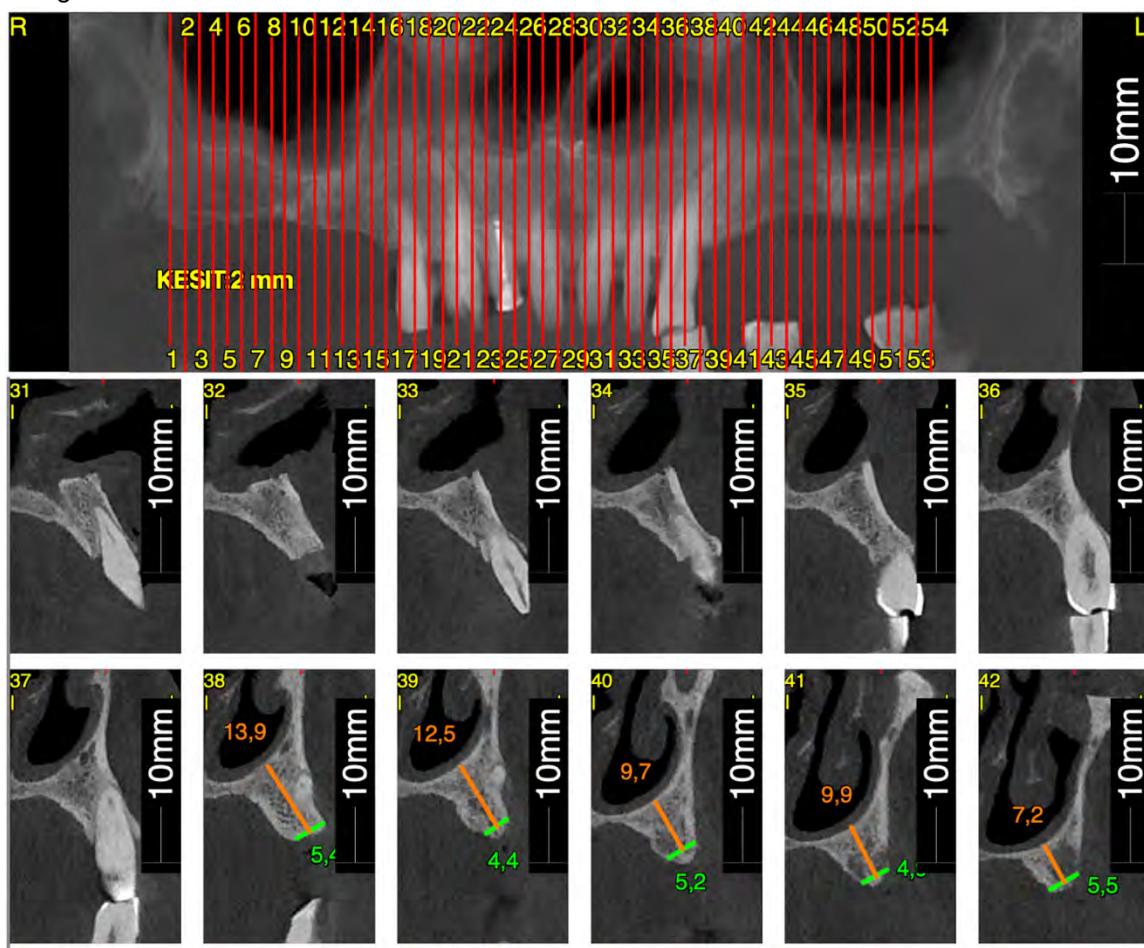


Figure 1: CBCT images 6 months before surgery (sections 39–40, planned area of implant 24).

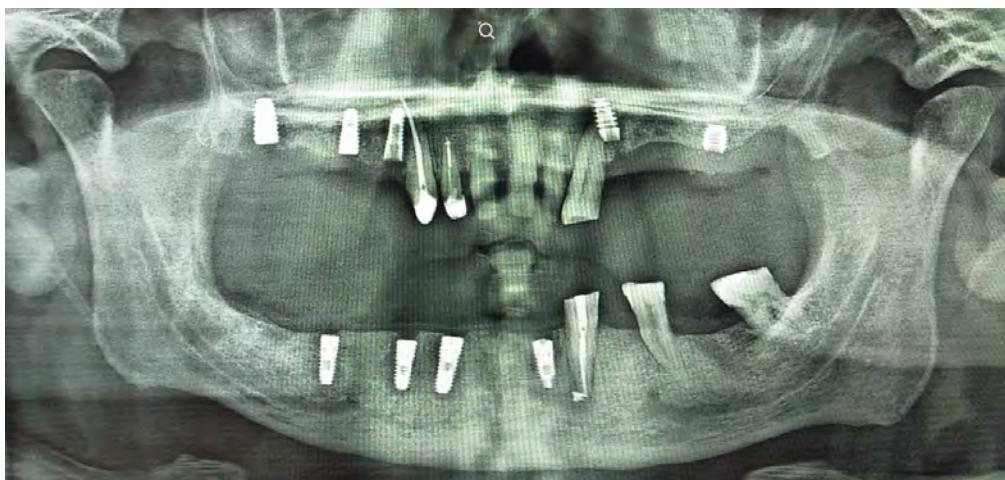


Figure 2: Postoperative panoramic radiograph at 1 week.

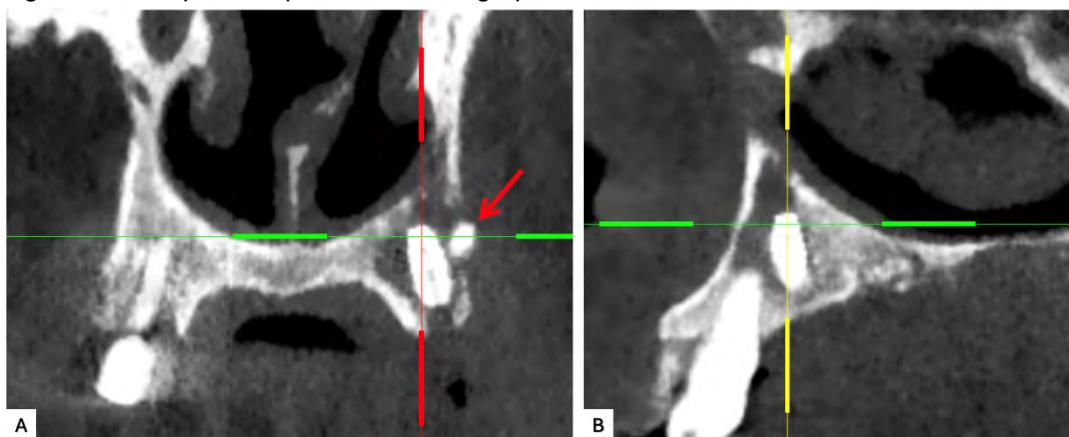


Figure 3: Postoperative CBCT images. Coronal(A) and sagittal(B) views of implant 24. (Red arrow: Curved root apex of canine tooth)

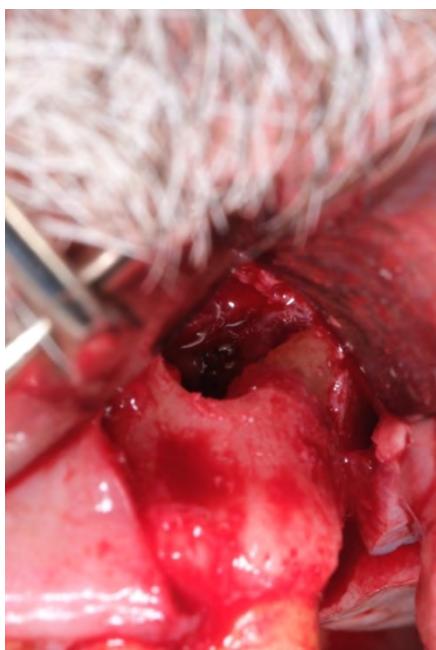


Figure 4: Explantation of implant 24.



Figure 5: Explantation of implant 24.



Figure 6: View of explanted implant.

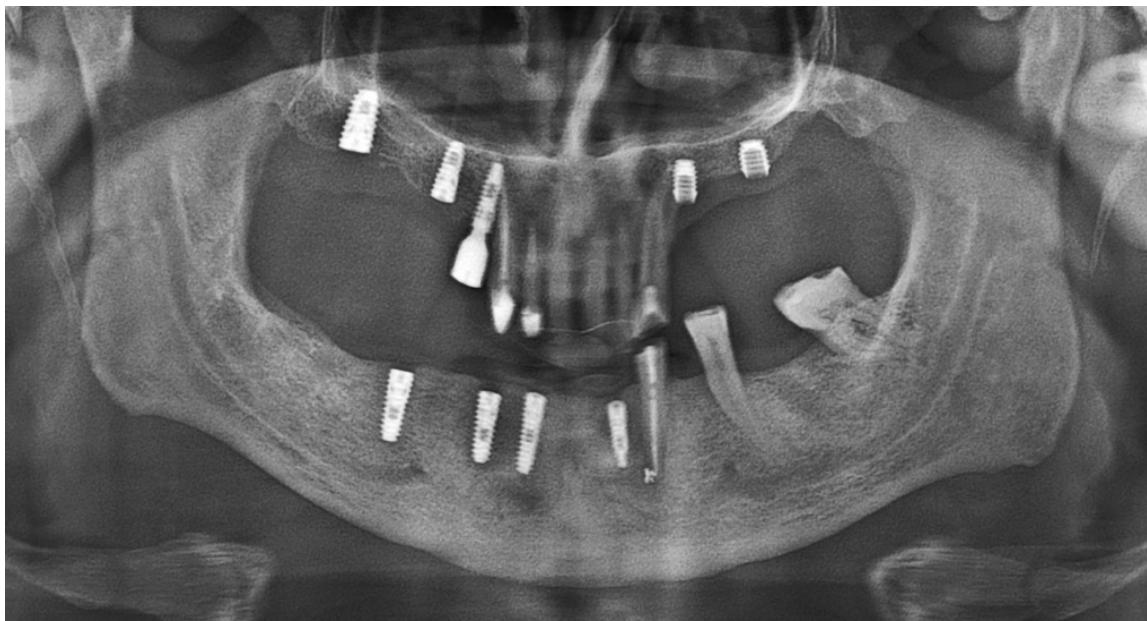


Figure 7: Postoperative panoramic radiograph at 1 week following reimplantation of implant 24.

EP-065

SINUS MEMBRANE PERFORATION DUE TO ALVEOLAR ANTRAL ARTERY LOCATION: LATERAL SINUS LIFT CASE REPORTZehra Gülerol Aydin, Yusuf Polat, Ömer Faruk Boylu

Bolu Abant Izzet Baysal University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Bolu, Turkey

zehra.gulerol@ibu.edu.tr**Abstract**

Objective: In dental implant procedures in the posterior maxilla region, the need for sinus floor elevation frequently arises due to insufficient alveolar bone height. However, the location, diameter and course of the alveolar antral artery (AAA) during this surgical procedure can increase the risk of intraoperative complications. Injury to this artery can lead to complications such as sinus membrane perforation. In this case report, a case of sinus membrane perforation due to alveolar antral artery (AAA) injury during the lateral window technique is presented, and the importance of CBCT evaluation prior to sinus lift surgery is emphasized.

Case Report: A 66-year-old male patient with no history of systemic disease presented to our clinic for implant rehabilitation in the maxillary right posterior region. Implant placement was planned after sinus lifting. Sinus membrane perforation occurred due to the course of the alveolar antral artery within the bone and along the sinus membrane.

Conclusion: The AAA is a crucial anatomical structure that must be considered during lateral sinus lifting. The location and anatomical variations of the AAA directly influence the risk of intraoperative complications. Although preoperative CBCT assessment is useful, it may not reveal all variations. Surgical complications can develop in the event of AAA injury; therefore, appropriate surgical planning and intraoperative caution are of paramount importance. When sinus membrane perforation occurs, repair with a collagen membrane is a safe and effective treatment method.

Keywords: Alveolar antral artery, lateral sinus lift, sinus membrane, dental implant

1. Introduction

In the posterior maxilla, dental implant applications frequently encounter insufficient residual bone height. Insufficient residual bone height may occur due to resorption of bone height over time after tooth extraction, according to Wolff's law, or as a result of maxillary sinus pneumatization (1, 2). For the rehabilitation of the edentulous posterior region, sinus lifting procedures, zygomatic implants, or mini-implants may be applied (3-5). The lateral window technique, also known as the Caldwell-Luc technique, was introduced by Tatum H. Jr. in 1977 (6). This technique is a predictable procedure with a high success rate (7). However, during this surgical procedure, the localization, diameter, and course of the alveolar antral artery (AAA) can increase the risk of intraoperative complications (8, 9).

The AAA is an anastomosis formed between the posterior superior alveolar artery and the infraorbital artery, and it can exhibit variable anatomical variations along the lateral wall of the maxillary sinus (10, 11). Injury to this artery may lead to complications such as difficult-to-control intraoperative bleeding, narrowing of the surgical field, hemosinus, and perforation of the sinus membrane (12, 13). Three-dimensional imaging methods such as cone beam computed tomography (CBCT) are useful for the preoperative detection of the AAA; however, the literature reports variations in radiological visibility rates, and it has been noted that not all anatomical variations can be visualized (11, 14). In this study, a case of sinus membrane perforation due to AAA injury during the lateral window technique is presented and evaluated considering the current literature.

2. Case Report

A 66-year-old male patient with no history of systemic disease presented to our clinic for implant rehabilitation in the maxillary right posterior region. Due to the absence of teeth #15 and #17, an implant placement was planned, but external sinus lifting and grafting were scheduled because insufficient residual bone height was detected in the relevant area. During surgery, following the creation of the lateral window, the alveolar antral artery was observed during sinus membrane elevation. Perforation of the sinus membrane occurred during elevation due to the artery's relationship with both the bone and the membrane. The perforation area was covered with a collagen membrane, and the region was closed primarily with 4.0 suture material. The patient is currently still under follow-up.

3. Discussion

Although the alveolar antral artery (AAA) has been reported in 100% of cadaver studies, studies conducted using CBCT have reported detection rates ranging from 61% to 95% (8, 10, 15). The artery's diameter generally varies between 0.85 and 1.5 mm, and vessels with a diameter of ≥ 1 mm are noted to cause clinically significant bleeding during surgery (11, 14). The course of the AAA along the lateral wall demonstrates several variations: intraosseous type (the vessel runs completely within the bone); subperiosteal or partially intraosseous type (the vessel runs close to the bone surface or partially emerges from the bone); extraosseous type (the vessel is located on the external bony surface or in a submucosal position); intrasinusoidal type (the vessel runs within the sinus cavity); and combined type (8, 10, 11). In the present case, the artery was observed to course both within the bone and along the membrane, representing a rare condition that may be classified as a "combined type," extending beyond the classical variations described in the literature.

Injury to the AAA can lead to complications such as intraoperative bleeding, membrane perforation, washing out of the graft material, and hemosinus formation. Several methods have been proposed to prevent these complications, including determining the artery's location through preoperative CBCT analysis, designing the lateral window away from the artery, preserving the artery using the double-window technique, performing the osteotomy with piezosurgery and managing arterial injury via ligation, coagulation, or application of a collagen plug (11, 14, 16-18). In the presented case, the sinus membrane perforation was successfully repaired with a collagen membrane, which has been described in the literature as a reliable and biocompatible treatment method.

4. Conclusion

Sinus membrane perforation is a common complication encountered during sinus lifting surgery. One possible cause of this condition is the anatomical position of the alveolar antral artery AAA. Performing a preoperative evaluation using CBCT prior to sinus lifting is of great importance for determining the location of the AAA, its distance from the alveolar crest, and whether it follows an intraosseous or combined course. Such assessment is critical for ensuring the safety and effectiveness of the surgical planning and approach.

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6. Figures

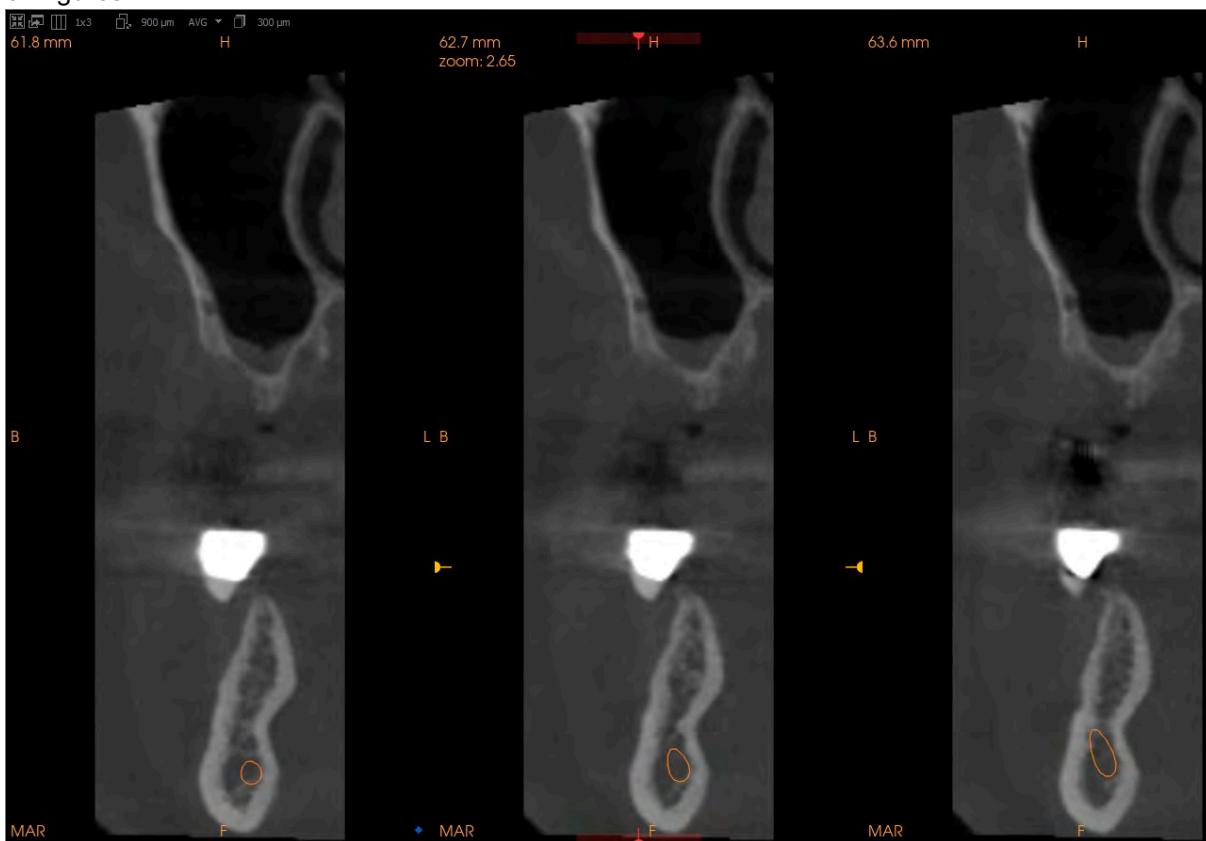


Figure 1. Coronal CBCT section view

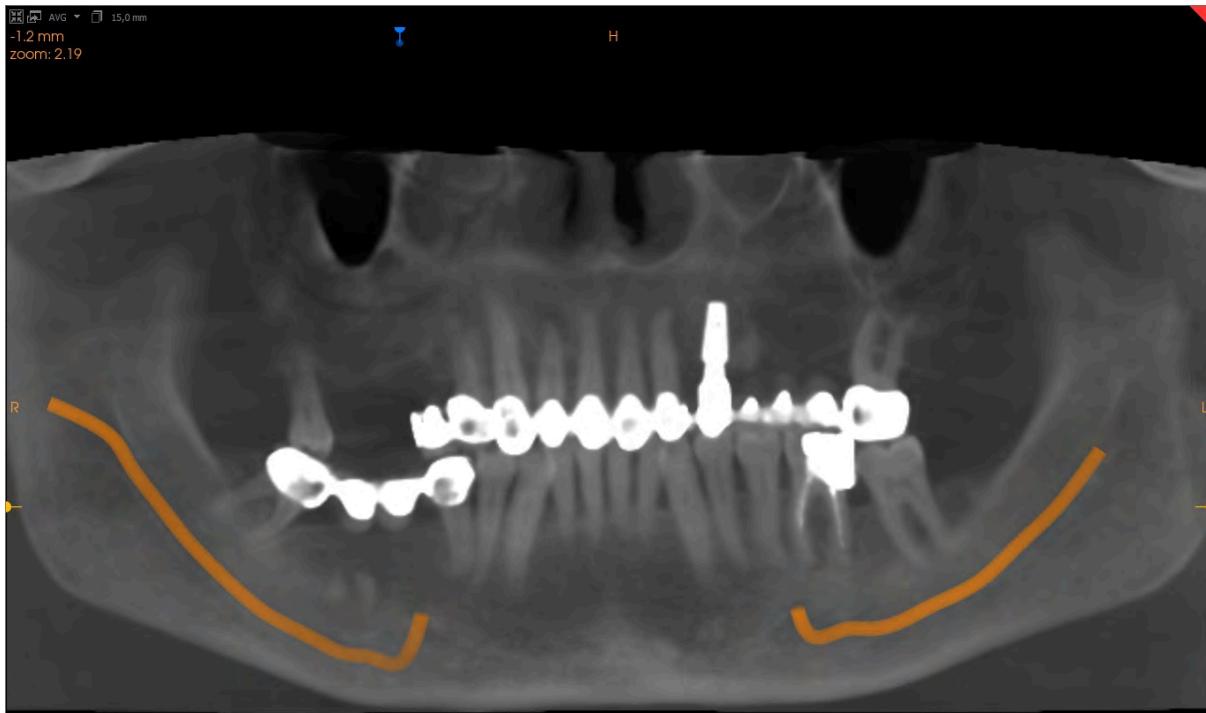


Figure 2. Panoramic radiograph



Figure 3. Intraoral view

EP-068

FOCAL CHRONIC SCLEROSING OSTEOMYELITIS FOLLOWING DENTAL IMPLANT TREATMENT: A CASE REPORT

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Abstract

Objective: Chronic diffuse sclerosing osteomyelitis is a predominantly mandibular, non-suppurative, long-standing and relapse-prone inflammatory disorder of bone. Clinically, it presents with dull pain, tenderness to palpation, and episodic swelling during exacerbations; fistula formation and purulent drainage are generally absent.

Case Report: A systemically healthy 45-year-old woman presented with pain and swelling around a dental implant in the posterior left mandible. The patient reported jaw pain radiating from the vicinity of an implant placed 6 years earlier at an outside clinic. Cone-beam computed tomography revealed buccal cortical and medullary lytic changes in the posterior left mandible. The specimen was submitted for histopathologic analysis, which demonstrated focal chronic diffuse sclerosing osteomyelitis. At the 1-month follow-up, the patient was asymptomatic with resolution of clinical signs.

Conclusion: Treatment is grounded in a stepwise, conservative approach aimed at symptom control and reduction of exacerbations. Analgesia and NSAIDs form the cornerstone; antibiotics are used for limited courses only when suppuration or signs of secondary infection are present.

Keywords: Focal chronic diffuse sclerosing osteomyelitis, Dental implant, Osteomyelitis

1. Introduction

Mandibular chronic diffuse sclerosing osteomyelitis (DSO) is a rare condition with an estimated prevalence of approximately 1 in 200,000. It represents a chronic and sterile form of osteomyelitis, also referred to as primary chronic osteomyelitis, chronic sclerosing osteomyelitis, or non-suppurative osteomyelitis. The etiopathogenesis remains incompletely understood; proposed contributing factors include low-grade local triggers, dysregulation of the host immune response, and potential associations within the SAPHO/CRMO (Chronic Recurrent Multifocal Osteomyelitis) spectrum (1-4). Mandibular DSO is characterized by a pronounced endosteal proliferative response of the mandible to a low-grade infection. Clinically, it follows a cyclic course with intermittent asymptomatic periods. Owing to its rarity, this condition is often overlooked during the diagnostic process (1, 5). It predominantly occurs in middle-aged and elderly individuals and is more common in women than in men. The most frequently affected site is the posterior region of the mandible. Laboratory findings are non-specific; erythrocyte sedimentation rate and C-reactive protein may show mild to moderate elevation during flares, and cultures are often negative (6-8). The differential diagnosis includes chronic suppurative osteomyelitis, condensing osteitis, fibrous dysplasia, Paget disease, osteosclerotic metastases and medication-related osteonecrosis associated with antiresorptive or antiangiogenic agents; clinicoradiologic correlation is essential for diagnosis. Imaging on panoramic radiographs and cone-beam computed tomography (CBCT) typically demonstrates diffuse sclerosis with obliteration of medullary spaces, cortical thickening and ill-defined, widespread involvement; in active phases, limited osteolytic foci and periosteal reaction may be observed (9).

2. Case Report

A systemically healthy 45-year-old woman presented with pain and swelling around a dental implant in the posterior left mandible. Clinical and radiographic examinations were performed. The patient reported jaw pain radiating from the vicinity of an implant placed 6 years earlier at an outside clinic. Cone-beam computed tomography revealed buccal cortical and medullary lytic changes in the posterior left mandible. An incision was made extending from the distal aspect of tooth #33 to the distal aspect of tooth #36 and a representative bone biopsy was obtained. The surgical site was irrigated with normal saline and closed primarily with 4-0 silk sutures. Histopathologic examination confirmed the diagnosis of focal chronic

diffuse sclerosing osteomyelitis. At the 1-month follow-up visit, the patient was symptom-free, and complete resolution of clinical findings was observed.

3. Discussion

In this case, the development of chronic sclerosing osteomyelitis originating from the peri-implant region was observed in a systemically healthy individual. Mandibular osteomyelitis is more common than maxillary involvement, likely due to the mandible's dense cortical structure and relatively limited vascular supply (10, 11). During implant placement, the risk of bacterial inoculation increases and biofilm formation on the implant surface can facilitate the development of osteomyelitis (12).

Osteomyelitis is associated not only with microbial invasion but also with host bone response and local ischemic conditions. In chronic sclerosing osteomyelitis, persistent inflammation leads to reactive sclerosis and fibrous tissue proliferation (5). In the present case, histopathologic findings demonstrating chronic sclerotic changes were consistent with this pathophysiologic mechanism.

Clinically, chronic osteomyelitis presents with episodic pain, swelling, and trismus (5, 12). In this case, the patient experienced pain originating from the implant region radiating to the jaw, but no systemic signs of infection were detected. Imaging particularly CBCT is valuable in detecting both lytic and sclerotic changes (13). Definitive diagnosis relies on histopathologic evaluation, which typically demonstrates sclerotic bone, fibroblastic proliferation and inflammatory cell infiltration (14).

Management generally combines surgical and conservative approaches. Long-term antibiotic therapy (4–6 weeks) is commonly administered and should be guided by culture results (15). Surgical treatment options include decortication, curettage, and, when necessary, segmental resection. Adjunctive therapies such as hyperbaric oxygen, non-steroidal anti-inflammatory drugs (NSAIDs) and supportive measures have also been reported in the literature. Bisphosphonate therapy has been suggested as an alternative approach in refractory cases (16).

In the present case, successful clinical resolution was achieved following bone biopsy and conservative management with amoxicillin/clavulanic acid and NSAID therapy. The postoperative course was uneventful, consistent with previously reported conservative treatment outcomes (16). However, long-term follow-up remains essential, as chronic osteomyelitis has a tendency to recur.

4. Conclusion

In conclusion, mandibular osteomyelitis represents a rare but significant complication in the peri-implant region. Accurate diagnosis requires a combined assessment of radiologic and histopathologic findings. Treatment should be individualized, integrating both surgical and medical approaches as appropriate. This case highlights that a conservative management strategy may be sufficient in selected patients.

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6. Figures



Figure 1. Preoperative intraoral view



Figure 2. Panoramic radiograph

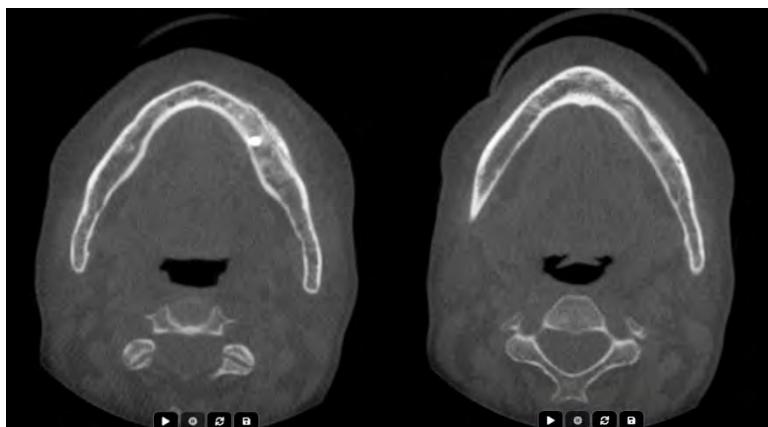


Figure 3. CBCT views

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TREATMENT STRATEGIES FOR PALATAL PLEOMORPHIC ADENOMA: SECONDARY INTENTION HEALING VERSUS CGF-ENHANCED PRIMARY CLOSURETutku Tekin Ayaz ^a, Muharrem Ergün Dudak ^b, Hüseyin Koca ^cA- Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, tutku.tekin.ayaz@ege.edu.trB- Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, mergundudak81@gmail.comC- Ege University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkey, huseyin.koca@ege.edu.tr**Abstract**

Objective: Pleomorphic adenoma is the most common benign type of salivary gland tumor, predominantly observed in the parotid gland, as well as in the minor salivary glands of the hard and soft palate. Due to its histological diversity, risk of recurrence, and, albeit rarely, potential for malignant transformation, it holds significant clinical importance. In this study, two cases of palatal pleomorphic adenoma were treated with different surgical methods, and defect management approaches were evaluated.

Case Reports: The first case was a 52-year-old systemically healthy male who presented with a painless, slow-growing swelling in the hard palate. The lesion was completely excised together with its capsule under local anesthesia, and the defect was left for secondary healing with the support of a palatal acrylic plate. The second case was a 38-year-old systemically healthy female. Surgical excision was performed by elevating a mucoperiosteal flap, and the lesion was totally removed along with its capsule. A Concentrated Growth Factor (CGF) membrane was placed at the defect site, and primary closure was achieved. In both cases, histopathological examination confirmed the diagnosis of pleomorphic adenoma. No postoperative complications developed, and no recurrence was observed during regular follow-up.

Conclusion: Although pleomorphic adenoma is benign, careful total excision with adequate surgical margins is required to prevent recurrence. Palatal defects may be left to secondary healing or closed primarily with the support of biological materials such as CGF. The presented cases demonstrate that both approaches are effective. Long-term follow-up is essential due to the risk of recurrence and possible malignant transformation.

Key words: Pleomorphic adenoma, Hard Palate, Surgical excision, Minor salivary glands

1. Introduction

Pleomorphic adenoma is the most common benign neoplasm among salivary gland tumors, accounting for approximately 60–70% of all cases. Clinically, it is most frequently encountered in the parotid gland (70–85%), while the submandibular gland (5–10%) and minor salivary glands (10–15%) may also be affected (1,2). In intraoral regions, the hard and soft palate have been most commonly reported (3,4). For this reason, pleomorphic adenoma should be prioritized in the differential diagnosis of tumors originating from the palate. Pathologically, pleomorphic adenoma has a heterogeneous structure composed of epithelial and myoepithelial cells accompanied by mixed, chondroid, or fibrous stroma (2,5). This morphological diversity causes diagnostic difficulties and may lead to confusion with malignant tumors (4,6). Imaging modalities (CT, MRI, CBCT) play an important role in determining the tumor boundaries, its relationship with surrounding tissues, and possible bone invasion (3,6). However, definitive diagnosis is established by histopathological examination and immunohistochemical analyses (1,2). Epidemiologically, pleomorphic adenoma is most frequently observed in the 3rd–6th decades, with a higher prevalence in

women (2,4). Pediatric cases have also been reported, making the diagnostic process more challenging (3,7). The clinical presentation usually involves an asymptomatic, slow-growing, painless mass (2,8). The mainstay of treatment is surgical excision of the tumor together with its capsule; simple enucleation is not recommended due to the high risk of recurrence (4). Molecular studies have shown that epithelial–mesenchymal transition (EMT) mechanisms may play a role in malignant transformation in pleomorphic adenoma (9). Furthermore, systematic reviews emphasize that recurrent cases are often associated with inadequate surgical margins or tumor protrusions extending beyond the capsule. In this context, pleomorphic adenoma continues to be an important focus for clinicians due to its histological diversity and surgical management challenges.

2. Case Reports

2.1. Case 1

A 52-year-old systemically healthy male patient presented with a painless, slow-growing swelling that had been present for about six months on the mucosa of the hard palate. Clinical examination revealed a well-circumscribed, firm lesion covered by intact mucosa; no extraoral asymmetry or cervical lymphadenopathy was detected. Radiographic examination revealed no bone resorption. Based on clinical and radiological findings, a preliminary diagnosis of pleomorphic adenoma was made, and surgical intervention was planned. Under local anesthesia, an incision was made through the palatal mucosa, and the tumor was carefully dissected from surrounding tissues and totally excised with its capsule (Figure 1A, 1B). The surgical field was left to heal by secondary intention, peripac was applied to the wound area, and a transparent palatal plate was used for the first 10 days to protect the surgical site and increase postoperative comfort (Figure 1C, 1E). However, the patient experienced significant pain during the postoperative period due to the secondary healing process. The excised mass (Figure 1D), approximately 3 × 2 cm in size, was macroscopically well-defined and lobulated. Histopathological examination revealed the typical morphology of epithelial and myoepithelial cells within a mixed stromal structure, confirming the diagnosis of pleomorphic adenoma. No postoperative complications were observed, wound healing progressed uneventfully with palatal plate support, and at the third-month follow-up, the surgical site was completely covered with mucosa, with no evidence of recurrence.

2.2. Case 2

A 38-year-old systemically healthy female patient presented with a painless, slow-growing swelling in the hard palate. Intraoral examination revealed a well-circumscribed, firm mass covered with intact mucosa (Figure 2A). Radiographic examination revealed no evidence of bone invasion. Based on clinical and radiological findings, a preliminary diagnosis of pleomorphic adenoma was made, and surgical excision was planned. Under local anesthesia, an incision was made in the palatal mucosa, and a mucoperiosteal flap was elevated (Figure 2B). The lesion was carefully dissected and totally excised with its capsule (Figure 2D). Following excision, a Concentrated Growth Factor (CGF) membrane was placed in the defect area to promote tissue regeneration, and the flap was closed primarily (Figure 2C, 2E). The excised mass was macroscopically well-defined and lobulated. Histopathological examination revealed the typical morphological features of epithelial and myoepithelial cells within a mixed stromal background, confirming the diagnosis of pleomorphic adenoma. No postoperative complications occurred; wound healing proceeded uneventfully, and regular follow-up revealed no signs of recurrence (Figure 2F).

3. Discussion

Pleomorphic adenoma is the most common benign tumor of the salivary glands and may occur in both major and minor salivary glands (1). Among the minor salivary glands, the hard palate is the most commonly affected site, typically presenting as a painless, slow-growing, mucosa-covered mass (4,5). It

has been reported to occur more frequently in women than in men (2,6). Our second case, a 38-year-old female patient with a hard palate lesion, is consistent with the literature.

Histopathologically, pleomorphic adenoma is characterized by epithelial and myoepithelial cells combined with mixed stromal components, and due to its morphological diversity, it may mimic malignant tumors (8,10). Berrerhdoche et al. and Hammami et al. emphasized that histopathological examination is essential for definitive diagnosis and that the capsule may show irregularities (7,11). Pseudopodadic extensions beyond the capsule may increase the risk of recurrence if the tumor is not completely excised (3,6). A systematic review by Lopes-Santos et al. reported that most recurrences in recurrent cases were due to inadequate surgical margins (9).

The gold standard treatment approach is total surgical excision of the tumor along with its capsule (1,5). Simple enucleation is not recommended due to its high recurrence risk (2,4). In our second case, unlike the first case, a mucoperiosteal flap was elevated for total excision of the lesion, followed by the placement of a CGF membrane in the defect area to accelerate wound healing and primary closure of the flap. In the literature, palatal defects are mostly left to heal by secondary intention with the support of palatal plates (7,11). Although secondary healing is preferred for its simplicity and ease of surgery, disadvantages include prolonged healing time, reduced patient comfort, and an increased risk of tissue contraction in large defects. In contrast, primary closure shortens the healing period, improves patient comfort, and reduces postoperative complications (2,4). In our second case, primary closure with CGF support provided complication-free healing and rapid tissue closure.

Matsumiya-Matsumoto et al. demonstrated that epithelial–mesenchymal transition (EMT) processes contribute to histological heterogeneity in pleomorphic adenomas and may play a role in malignant transformation potential (12). Therefore, despite its benign nature, long-term follow-up is crucial in pleomorphic adenoma cases. Reports by Reddy et al. and by Yousra and Saliha also highlight that regular postoperative follow-up is critical for the early detection of possible recurrences (2,4).

In conclusion, the total excision performed in our cases is consistent with the surgical approach recommended in the current literature. Closure of the defect with CGF support provided rapid, complication-free healing and may be considered a novel approach contributing biologically to the literature. Adequate surgical margins and long-term follow-up remain indispensable in minimizing the risk of recurrence.

4. Conclusion

Pleomorphic adenoma, despite its benign nature, is a tumor that requires caution and precision in surgical management. In the presented cases, total excision with the capsule was consistent with current literature, and in particular, primary closure with CGF support in the second case provided rapid and complication-free healing. This approach may be considered an advantageous option in terms of improving patient comfort and accelerating tissue healing. Adequate surgical margins and regular long-term follow-up continue to be the fundamental elements in reducing the risk of recurrence.

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6.Figures

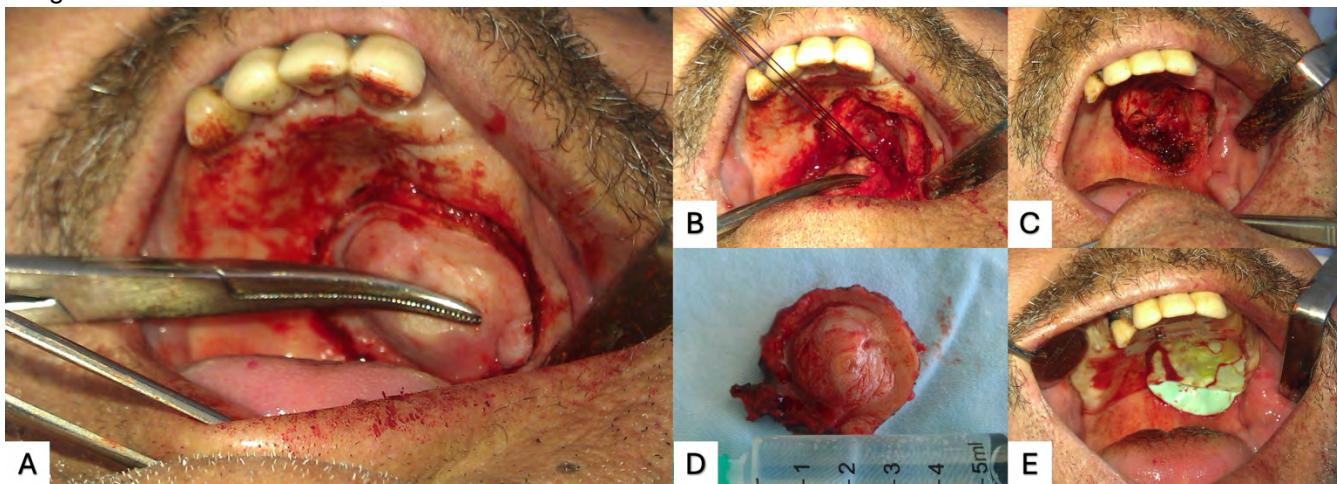


Figure 1: (A) Tumor dissection after palatal mucosal incision. (B) Lesion separation from surrounding tissues. (C) Post-excision surgical defect. (D) Excised lobulated mass. (E) Placement of a palatal plate for secondary healing support.

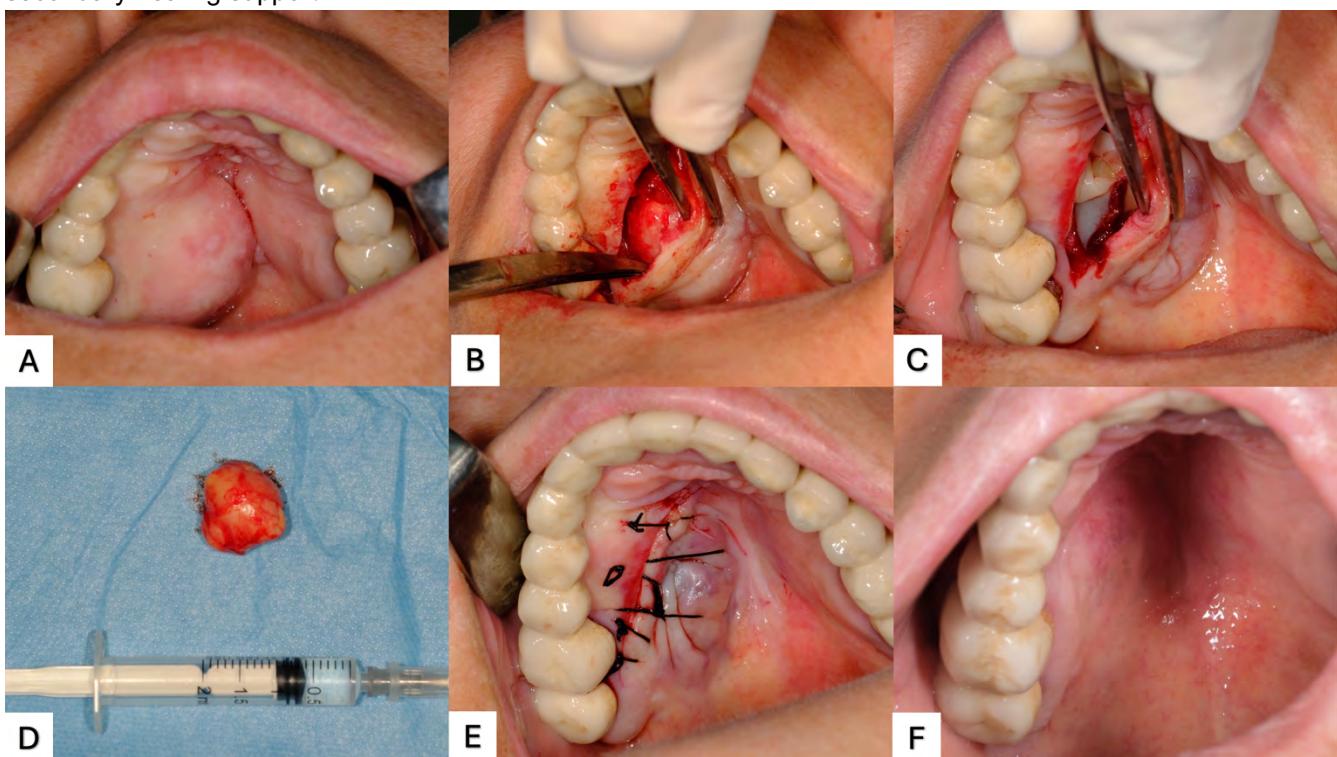


Figure 2: (A) Preoperative intraoral view. (B) Surgical exposure and careful dissection of the lesion. (C) Placement of a Concentrated Growth Factor (CGF) to support tissue regeneration. (D) Excised lobulated mass. (E) Postoperative intraoral view. (F) Postoperative follow-up at 6 months showing complete mucosal healing without recurrence.

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SQUAMOUS CELL PAPILLOMA OF THE BUCCAL MUCOSA: A CASE REPORT

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Abstract

Introduction: Squamous cell papilloma (SCP) is a benign exophytic and papillary lesion arising from the squamous epithelium of the oral mucosa and is often associated with human papillomavirus (HPV) infection. Clinically, it commonly presents as a cauliflower-like or finger-shaped growth and may be either pedunculated or sessile. The lesion tends to grow slowly and is usually painless, which may result in it remaining unnoticed for a long time. Diagnosis is made through clinical examination and histopathological analysis. Surgical excision is the preferred treatment, and the recurrence rate is generally low after complete removal. However, the risk of recurrence may increase in immunocompromised patients.

Case Report: A 55-year-old systemically healthy female patient presented to our clinic. She reported no complaints regarding the lesion. Intraoral examination revealed a painless, sessile, cauliflower-like lesion measuring approximately 0.5 cm on the left buccal mucosa. The lesion was excised under local anesthesia and submitted for histopathological examination. The histopathological findings confirmed the diagnosis of squamous cell papilloma. At the postoperative 1-month follow-up, no recurrence or symptoms were observed.

Conclusion: Squamous cell papilloma can progress slowly without causing symptoms. Once detected, it should be excised. Non-surgical treatment options may include interferon therapy, cryotherapy, laser ablation, and topical antiviral agents. Due to the potential risk of recurrence, patients should be scheduled for regular postoperative follow-up visits.

Keywords: HPV, Squamous Cell Papilloma, Surgical Excision

1. Introduction

Oral squamous cell papilloma (OSCP) is an exophytic lesion of the oral soft tissues that develops as a benign proliferation of stratified squamous epithelium, often exhibiting a papillary or verrucous surface (1). Clinically, this lesion is usually asymptomatic, tends to grow slowly, and can persist for a long time without being noticed by the patient. Therefore, most cases are diagnosed incidentally during routine examinations (2). The lesion may be pedunculated or sessile in appearance, with a morphology ranging from finger-like projections to a cauliflower-like mass (3). Human papillomavirus (HPV) plays an important role in the development of OSCP. Low-risk HPV types, particularly types 6 and 11, are frequently associated with these lesions. However, the literature has not established a definitive correlation between specific HPV genotypes and particular oral lesions (4). This suggests that, in addition to viral factors, mucosal trauma, local immune responses, and environmental influences may contribute to the pathogenesis. Although OSCP can be observed in various regions of the oral cavity, the most common sites are the tongue, lips, and soft palate (1). The buccal mucosa is a relatively less frequently affected site; however, due to its susceptibility to trauma, it should be carefully evaluated for papilloma development. In this case report, we present a case of OSCP localized to the left buccal mucosa in a 55-year-old female patient with no systemic disease and discuss the findings in the context of current literature.

2. Case Report

A 55-year-old systemically healthy female patient was referred to our clinic after a lesion was noticed in her oral cavity. The patient reported no symptoms related to the lesion. Intraoral examination revealed a painless, sessile, cauliflower-shaped lesion approximately 1 cm in diameter on the left buccal mucosa (Figure 1). Under local anesthesia, a ring block was performed around the lesion, and the lesion was excised (Figures 2, 3). The site was closed primarily with 4-0 Vicryl sutures (Figure 4), and the excised tissue was submitted for histopathological examination. Histopathology confirmed the diagnosis

of squamous cell papilloma. At the one-month postoperative follow-up, no recurrence was observed, and the patient remained asymptomatic (Figure 5).

3. Discussion

Squamous cell papilloma (SCP) is one of the most common benign lesions of the oral mucosa and is often associated with human papillomavirus (HPV) infection (5). Although low-risk HPV types, particularly types 6 and 11, are considered to play a significant role in the pathogenesis of OSCP, a definitive association between specific HPV types and oral papillomas has yet to be established (5). The most frequent locations for OSCP are the tongue, lips, and soft palate; however, it may also present in less common sites such as the buccal mucosa (6). In this case, the lesion was located on the left buccal mucosa, and the patient was asymptomatic, which is consistent with the typical clinical presentation of OSCP. The benign nature and characteristic papillary architecture of OSCP assist in differentiating it from verrucous or malignant lesions (3). Surgical excision is the standard treatment, and recurrence rates are generally low following complete removal. Nevertheless, regular follow-up is important due to the potential for recurrence (2). Further research into the role of HPV and the molecular characteristics of OSCP may help to better understand its pathogenesis and optimize therapeutic approaches.

4. Conclusion

Squamous cell papilloma often progresses slowly and asymptotically. When detected, it should be excised. In addition to surgical excision, combination therapies, such as with interferon, can also be considered (2). Regular postoperative follow-ups are recommended to monitor for potential recurrence.

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6. Figures



Figure 1: Intraoperative intraoral view of the patient



Figure 2: Intraoral view after excision of the lesion



Figure 3: The excised lesion



Figure 4: The excision site closed primarily with Vicryl sutures



Figure 5: Intraoperative view of the patient at the 1-month follow-up

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CEMENTO-OSSIFYING FIBROMA ASSOCIATED WITH AN IMPACTED MANDIBULAR CANINE: A CASE REPORTNur Muhammed DEMİR^a, Serkan POLAT^a

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Abstract

Introduction: According to the World Health Organization's 2022 classification, cemento-ossifying fibroma is defined as a benign odontogenic tumor of mesenchymal origin. It typically exhibits slow growth and is more commonly observed in women aged 30–40 years. Most cases are detected incidentally; however, larger lesions can lead to facial asymmetry and tooth displacement. Radiographically, it appears as a well-defined, encapsulated, mixed radiolucent–radiopaque mass. Histopathologically, it consists of fibrous tissue containing bone or cementum-like structures. Surgical treatments such as enucleation or resection are usually effective, with low recurrence rates.

Case Report: A 23-year-old systemically healthy female patient presented to our clinic with a complaint of a hard swelling in the right mandibular premolar region. Panoramic and CBCT imaging revealed radiopaque masses surrounded by a radiolucent border associated with an impacted canine. Under local anesthesia, the impacted tooth was extracted, and the lesion was excised. Histopathological examination confirmed the diagnosis of cemento-ossifying fibroma. No postoperative complications were observed, and bone regeneration was evident in the affected region.

Conclusion: Cemento-ossifying fibroma generally presents as a slowly expanding, asymptomatic mass in the mandible. Conservative surgical management (enucleation or curettage) is the preferred first-line treatment.

Keywords: Cemento-Ossifying Fibroma, Excision, Impacted Tooth

1. Introduction

Cemento-ossifying fibroma (SOF) is a benign fibro-osseous odontogenic tumor that typically occurs in the mandible and maxilla, particularly in the molar and premolar regions. The development of SOF within the bone is believed to originate from mesenchymal blast cells derived from the periodontal ligament, which have the potential to form cementum, bone, fibrous tissue, or a combination thereof. This process may be triggered by factors such as tooth extraction or, in some cases, trauma (1). In addition, extraosseous cases of SOF have been reported in the literature to originate from embryonic cell remnants or ectopic periodontal membranes (2). Clinically, SOF usually presents as a painless, slowly growing mass in the jaws. In early stages, only displacement of teeth may be noted (3). The teeth adjacent to the lesion are typically vital, and root resorption is rare. The tumor is well demarcated from the surrounding bone and can continue to grow slowly or actively unless surgically removed (4). Radiographically, lesions appear radiolucent in the early stages but acquire a mixed radiopaque appearance as mineralization progresses. Treatment of SOF varies according to the size of the lesion, but curettage or enucleation is most commonly employed. Due to its well-circumscribed nature, surgical excision is generally straightforward; however, in recurrent or aggressive cases, radical resection and bone grafting may be required (5). Prognosis is generally favorable, although recurrence has been reported, particularly in maxillary lesions. Therefore, long-term follow-up is recommended. In this study, we present the surgical management of a lesion detected in the alveolar bone of a patient who presented with swelling and was histopathologically diagnosed with cemento-ossifying fibroma.

2. Case Report

A 23-year-old systemically healthy female patient presented to our clinic with a complaint of a firm swelling in the right mandibular premolar region that she had noticed for several months. Intraoral examination revealed a localized, firm bony expansion in the affected alveolar region. Panoramic radiography and cone-beam computed tomography (CBCT) performed for diagnostic purposes revealed a well-defined lesion associated with an impacted canine in the anterior-premolar region of the mandible,

surrounded by a radiolucent rim and containing multiple radiopaque foci (Figure 1, Table 1). Surgical treatment was performed under local anesthesia with epinephrine. A trapezoidal full-thickness mucoperiosteal flap was elevated using a No.15 scalpel blade and a periosteal elevator. A bony window was created in the buccal cortex using a surgical bur (Figure 2). The impacted canine was atraumatically extracted, and the surrounding calcified mass was excised and sent for histopathological examination (Figures 3, 4). The surgical field was irrigated with sterile saline, and the flap was repositioned and closed primarily with 4-0 silk sutures. A postoperative control radiograph was obtained (Figure 5). Postoperatively, the patient was prescribed amoxicillin/clavulanic acid (Augmentin®, 1 g BID), dexketoprofen trometamol (Arveles®, 25 mg), and a chlorhexidine gluconate mouth rinse (Kloroben®). The early postoperative period was uneventful. Histopathological analysis confirmed the diagnosis of cemento-ossifying fibroma. At the 4-month follow-up visit, clinical examination revealed no symptoms (Figure 6), and panoramic radiography showed significant bone healing and early re-mineralization in the defect area (Figure 7).

3. Discussion

Benign mesenchymal odontogenic tumors are rare, non-malignant neoplasms originating from the mesenchymal tissues involved in tooth development (6). These tumors are derived from structures such as the periodontal ligament, dental follicle, and dental papilla. Histologically, they consist of mature fibro-collagenous connective tissue and may contain varying amounts of odontogenic epithelium. According to the latest WHO classification (2022), benign mesenchymal odontogenic tumors are divided into four subgroups: odontogenic fibroma (OF), cementoblastoma, cemento-ossifying fibroma (SOF), and odontogenic myxoma (7). Among these, SOF is one of the most common (8). It predominantly affects the mandible and maxilla, especially in the molar and premolar regions (9). SOF typically manifests as a slowly enlarging, asymptomatic, and well-circumscribed lesion. Histopathologically, SOF is characterized by a fibrotic stroma containing mineralized trabeculae and cementum-like material, which are key features for diagnosis. A multidisciplinary approach is crucial in diagnosing SOF, combining clinical evaluation, radiographic imaging, and histopathological analysis. SOF should be differentiated from other lesions with similar features, such as calcifying epithelial odontogenic tumor (CEOT). CEOT often resembles SOF clinically but can be distinguished by its age distribution, typically occurring between 8 and 92 years of age, with a mean age of approximately 40 years. CEOT usually occurs in the molar region and is often associated with an unerupted or impacted tooth. Radiographically, it initially appears radiolucent but develops a characteristic "honeycomb" or "snowflake" appearance as it progresses (10). SOF must also be differentiated from other fibro-osseous lesions, such as fibrous dysplasia, periapical cemento-osseous dysplasia, and ameloblastic fibroma. Recognizing the characteristic histopathological and radiological features of SOF is essential for accurate diagnosis and proper treatment. Treatment typically involves surgical excision, and prognosis is generally good due to the lesion's well-circumscribed nature (11). Case reports play a vital role in enhancing the understanding of the clinical and histopathological diversity of SOF. Data from published cases highlight the variations in size, location, and symptoms of SOF, guiding surgical strategies and helping to anticipate the risk of recurrence.

4. Conclusion

In this case, the cemento-ossifying fibroma in the mandible was confirmed by typical radiological and histopathological features, and complete surgical excision resulted in uneventful healing. Complete removal of the lesion minimized the risk of recurrence, and no recurrence was observed during follow-up. Although SOF is a rare benign odontogenic tumor, early diagnosis and appropriate surgical management are essential, especially in large or aggressive cases, to preserve both functional and esthetic outcomes. Given the recurrence reported in the literature, regular clinical and radiological follow-up is recommended.

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6. Figures



Figure 1: Preoperative panoramic image of the patient



Figure 2: Trapezoidal flap elevation and creation of a bony window in the buccal cortex using a surgical bur



Figure 3: Cavity view after extraction of the impacted canine and excision of the surrounding hard tissues



Figure 4: Tissues removed from the relevant area



Figure 5: Panoramic radiograph taken for postoperative evaluation of the relevant area



Figure 6: Intraoperative image taken at the postoperative fourth-month follow-up appointment



Figure 7: Postoperative fourth-month follow-up radiograph obtained from the patient.

7. Tables



Table 1: Preoperative CBCT images of the patient

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RADİCULAR CYST ASSOCIATED WITH AN IMPACTED MANDİBULAR THİRD MOLAR: A CASE REPORTNur Muhammed Demir^a, Ömer Faruk Boylu^a

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Abstract

Introduction: Radicular cyst is the most common odontogenic cyst that develops in the periapical region of non-vital teeth. It is usually asymptomatic and is often detected on routine radiographs as a well-defined radiolucent lesion. Radicular cysts most frequently occur between the third and sixth decades of life and are more common in males. They are most often observed in the anterior maxillary region. Treatment options include root canal therapy, enucleation, or marsupialization.

Case Report: A 19-year-old systemically healthy female patient presented to our clinic with a complaint of pain in the right mandibular region. Radiographic examination revealed a well-defined radiolucent lesion associated with the impacted mandibular right third molar (tooth 48). Following the extraction of the tooth, the lesion was enucleated and sent for histopathological examination. The histopathology confirmed the diagnosis of a radicular cyst.

Conclusion: The treatment of radicular cysts includes conventional root canal therapy when the lesion is localized, and surgical procedures such as enucleation, marsupialization, or decompression when the lesion is larger.

Keywords: Enucleation, Impacted Tooth, Radicular Cyst

1. Introduction

Radicular cyst is the most common cystic lesion affecting the jaws (1). It originates from the epithelial rests of Malassez (2). It occurs more frequently in males and is usually asymptomatic unless secondarily infected. Most cases are diagnosed incidentally during routine dental examinations. Since it belongs to the class of inflammatory cysts, the affected teeth are usually non-vital. Studies have reported that radicular cysts develop from pre-existing periapical lesions in approximately 6–55% of cases (3). It predominantly occurs in permanent teeth, whereas its occurrence in primary teeth is rare (4). Patients often have a history of trauma, although some may be unaware of it (5). Radiographically, radicular cysts typically appear as well-defined, round, radiolucent lesions localized at the apex of the affected tooth. If left untreated, they can lead to bone resorption, tooth displacement, and clinical manifestations such as swelling. This case report describes the diagnosis, treatment, and radiographic and histopathological features of a radicular cyst associated with an impacted mandibular right third molar (tooth 48) in a 19-year-old female patient.

2. Case Report

A 19-year-old systemically healthy female patient presented to our clinic with a complaint of pain in the region of the mandibular right third molar. Intraoral examination revealed no swelling or hyperemic mucosa. CBCT and panoramic radiographs were obtained. Imaging revealed a well-defined radiolucent lesion in the posterior mandible encompassing the impacted mesioangular tooth 48, extending from the mandibular canal inferiorly to the sigmoid notch superiorly (Figures 1, 2). Local anesthesia with epinephrine was administered. A full-thickness flap was raised following an incision made with a No.15 scalpel blade, extending from the mesial aspect of tooth 46 to the external oblique ridge. Bone overlying the impacted tooth was carefully removed using a rotary instrument. Tooth 48 was extracted from the bony cavity. The cyst lining was separated from the surrounding bone using curettes and enucleated (Figure 3). During enucleation, a straw-colored, cheese-like fluid was discharged from the lesion (Figure 4). The cavity was then curetted and irrigated with saline to ensure complete removal of cystic remnants (Figure 6). The flap was repositioned and closed primarily with 4-0 silk sutures (Figure 7). The patient was prescribed amoxicillin/clavulanic acid (Augmentin BID 1 g), dexketoprofen trometamol (Arveles 25 mg), and chlorhexidine mouthwash (Kloroben) postoperatively. The excised specimen was sent for

histopathological analysis, which confirmed the diagnosis of a radicular cyst. The postoperative period was uneventful, and the patient remained asymptomatic during follow-up visits.

3. Discussion

Radicular cysts are classified as inflammatory odontogenic cysts in the most recent (2017) WHO classification. They typically occur at the apex of anterior maxillary teeth, are round, well-circumscribed, and slightly more prevalent in males. However, in the present case, the lesion was associated with tooth 48 in the posterior mandible. Radiographically, due to the lesion's close relationship with tooth #48, a provisional diagnosis of dentigerous cyst was initially considered. However, histopathological examination confirmed the lesion as a radicular cyst. Histopathology is essential to differentiate radicular cysts from other pathologies with similar radiographic appearances, such as odontogenic tumors, which may require different treatment protocols and have varying prognoses (6). Radicular cysts are most commonly seen in the third decade of life and are rare in the first decade (7). In this case, the patient was in the second decade of life. The asymptomatic and slow-growing nature of radicular cysts often allows them to reach large sizes insidiously (8), as in this case, where the lesion extended from the mandibular canal to the sigmoid notch. Long-standing lesions may cause pain, swelling, tooth mobility, or altered eruption paths of impacted teeth (9). According to Bernardi et al., the pathogenesis of radicular cysts involves pulp necrosis, colonization and proliferation of microorganisms within the root canal system, release of bacterial toxins and inflammatory mediators into the periapical area, and epithelial–stromal interactions (10). Periradicular inflammation stimulates the proliferation of the epithelial rests of Malassez (11), which are remnants of the periodontal ligament and proliferate in response to inflammatory stimuli, leading to cyst formation (12). Teeth associated with radicular cysts may show discoloration, test negative on electric pulp testing, or exhibit caries or fractures (13). Rarely, radicular cysts may undergo calcification. The cyst fluid is usually yellowish or dark serous or mucoid and may contain degenerative cell debris, cellular material, and keratin. In this case, straw-colored fluid containing cholesterol crystals was observed during enucleation. Treatment options for radicular cysts include root canal therapy, which helps reduce the development of periapical lesions and prevent cyst-like periapical lesions (14). For larger cysts, treatment approaches may vary, including marsupialization or enucleation. Marsupialization reduces intracystic pressure, allowing shrinkage of the cystic lining. In pediatric patients, decompression has been reported to be beneficial to avoid interfering with physiological development (15). Marsupialization may also be preferred to preserve surrounding vital structures and avoid complications such as bone fracture. However, in the present case, enucleation was chosen to completely remove the lesion.

4. Conclusion

This case demonstrates that radicular cysts can progress asymptotically over a long period and reach large sizes in the mandible. Histopathological examination is critical for accurate diagnosis. Surgical enucleation combined with extraction of the associated tooth resulted in a successful outcome. While marsupialization can be beneficial in reducing cystic pressure in larger lesions, enucleation ensures complete removal of the lesion. Therefore, early diagnosis and appropriate treatment planning are essential for favorable patient outcomes.

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6. Figures



Figure 1: Coronal CBCT image



Figure 2: Panoramic radiograph of the patient



Figure 3: Intraoperative view of the cyst enucleation procedure



Figure 4: Cyst contents showing yellowish, cheese-like material



Figure 5: Dimensions of the cyst



Figure 6: Surgical site following cyst enucleation



Figure 7: Postoperative intraoral view of the patient

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**REDUCTION OF THE FLOOR OF THE MOUTH WITH THE COMBINATION OF THE TRAUNER
TECHNIQUE AND ANTERIOR LINGUAL SULCOPLASTY: A CASE REPORT**Serkan Polat^a, Nur Muhammed Demir^a, Açelya Yeşil^a

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Abstract

Introduction: Insufficient buccal and lingual vestibular depth, high muscle insertions near the alveolar crest, and lack of keratinized mucosa can limit the long-term success of prosthetic rehabilitation. Anterior lingual sulcoplasty is a surgical approach aimed at deepening the lingual sulcus and increasing mucosal mobility. During the procedure, the high insertions of the mylohyoid and genioglossus muscles on the lingual side are released and repositioned apically. The Trauner technique is a classical method used for the reduction of the floor of the mouth. When combined with sulcoplasty, it enhances tongue and floor of the mouth mobility, improves vestibular depth, and provides favorable anatomical conditions for implant-supported prostheses.

Case Report: A 60-year-old systemically healthy female patient showed no pathological findings following mandibular overdenture implant surgery; however, after the placement of the healing abutments, a significant elevation of the floor of the mouth was observed. ENT consultation revealed no pathology in the region. As the elevated floor of the mouth was unsuitable for prosthetic fabrication, anterior lingual sulcoplasty combined with the Trauner technique was performed to reduce the floor of the mouth. The lingual flap and mylohyoid muscle were stabilized apically to achieve a new sulcus depth. To prevent recurrence, the previously fabricated guide was modified with visco-gel and positioned in place.

Conclusion: The combination of these two approaches is an effective method for ensuring the safe adaptation and long-term function of implant-supported prostheses in cases of advanced mandibular resorption.

Keywords: Anterior Lingual Sulcoplasty, Floor of the Mouth Reduction, Trauner Technique

1. Introduction

Alveolar ridge resorption in the mandible is commonly observed following tooth loss (1,6). This condition results in the elevation of the muscular attachments of the floor of the mouth and the lingual frenulum to the level of the alveolar ridge (1,3). Patients with mandibular ridge resorption often present with inadequate vestibular and lingual sulcus depth, as well as a lack of keratinized mucosa (3). These factors lead to problems with the retention and stability of conventional complete dentures, making the rehabilitation of patients with severely resorbed edentulous mandibles clinically challenging (3,4). To improve denture stabilization in resorbed mandibles, both vestibular and lingual sulcoplasty techniques have been developed. In some cases, a combination of these approaches may be indicated (6). Anterior lingual sulcoplasty is a surgical procedure performed to deepen the lingual sulcus and enhance the mobility of the mucosa. During this procedure, the high insertions of the mylohyoid and genioglossus muscles on the lingual side are released in an apical direction and repositioned (2,3). The Trauner technique is a classical method used for floor-of-the-mouth reduction. When combined with sulcoplasty, it improves tongue and floor-of-the-mouth mobility, enhances sulcus depth, and creates more favorable anatomical conditions for implant-supported dentures (1,3). These techniques are critical for denture adaptation and long-term function in patients with severe mandibular resorption (1,2,3).

2. Case Report

A 60-year-old systemically healthy female patient presented to our clinic for implant treatment. Approximately three months after the placement of implants in the anterior mandible, healing abutments were connected, and a significant elevation of the floor of the mouth was observed (Figure 1). The patient was referred to the Ear, Nose, and Throat (ENT) department to rule out sublingual gland pathology. No pathological findings were detected. Therefore, the patient was scheduled to undergo anterior lingual sulcoplasty combined with the Trauner technique for floor-of-the-mouth reduction. Local anesthesia was

administered intraorally between the mandibular left and right second molars (37–47) with buccal and lingual infiltration and extraorally in the submental region between the mental foramina. A partial-thickness flap was elevated from the lingual side of the mandibular crest extending from the left posterior region to the right mental foramen. Dissection was continued supraperiosteally. The mylohyoid muscle fibers in the left posterior region and the superior fibers of the genioglossus muscle in the anterior region were excised. The excised fibers were repositioned at a deeper level and secured using sutures passed through the submental region of the mandibular inferior border. For this procedure, 18-gauge needles were used as cannulas through which 3-0 Prolene sutures were passed. The needle was inserted extraorally at the mandibular inferior border and brought out intraorally through the base of the lingual sulcus (Figures 2 and 3). After the needle tip was passed through the flap margin, the suture material was fed into the needle lumen from the extraoral side and brought intraorally (Figure 4). The needle was then redirected from the extraoral submental region to the base of the lingual sulcus, and the intraorally positioned suture was passed back through the needle lumen in a loop fashion and brought out again to the extraoral side. The externalized suture was tied over a sterile IV tubing segment placed on the skin surface for stabilization. This procedure was performed at four points (Figure 5). Upon completion of the procedure, a previously fabricated guide modified with viscogel was placed to prevent relapse (Figures 6 and 7). The patient was followed up at 1 and 2 weeks postoperatively, and at both visits, the depth of the lingual sulcus was maintained successfully (Figures 8 and 9).

3. Discussion

Elevation of the floor of the mouth after implant surgery is a rare but significant condition that may compromise denture retention and stability. In such cases, preprosthetic surgical interventions such as lingual sulcoplasty and floor-of-the-mouth reduction are recommended (4). In this case, the combination of the Trauner technique and anterior lingual sulcoplasty effectively improved lingual sulcus depth. Literature reports indicate that anterior lingual sulcoplasty combined with frenectomy is an effective approach to increase sulcus depth in implant-supported overdenture cases (1). Similarly, modified tie-over techniques have been shown to aid wound healing after lingual sulcoplasty and reduce the risk of complications (2). The use of buttons during apical fixation of muscles in lingual sulcoplasty has been found to be beneficial, as it reduces pressure and irritation on the skin under tension, improving patient comfort and lowering infection risk (3). In this case, a sterile IV tubing segment was used for the same purpose. In mandibular overdenture cases, the combination of floor-of-the-mouth reduction and vestibuloplasty has been reported to improve prosthesis stability and function by increasing lingual sulcus depth (4). In light of these findings, the extraoral suture technique used in our case allowed stable repositioning of the excised genioglossus and mylohyoid fibers at a deeper level, maintaining the postoperative lingual sulcus depth and minimizing complications. However, the invasive nature of the procedure and the requirement for an experienced surgeon may limit its applicability. Longer-term follow-up studies with larger patient cohorts are needed to provide further evidence on the reliability and generalizability of this technique.

4. Conclusion

Achieving stable prosthesis retention in patients with severe mandibular ridge resorption and shallow lingual sulcus depth is challenging (1,3,4). In this case, elevation of the floor of the mouth following implant surgery was successfully managed using the Trauner technique combined with anterior lingual sulcoplasty.

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6. Figures



Figure 1: Elevation of the floor of the mouth observed after placement of the healing abutments



Figure 2: Needle directed extraorally from the inferior border of the mandible



Figure 3: The needle emerging intraorally from the base of the lingual sulcus

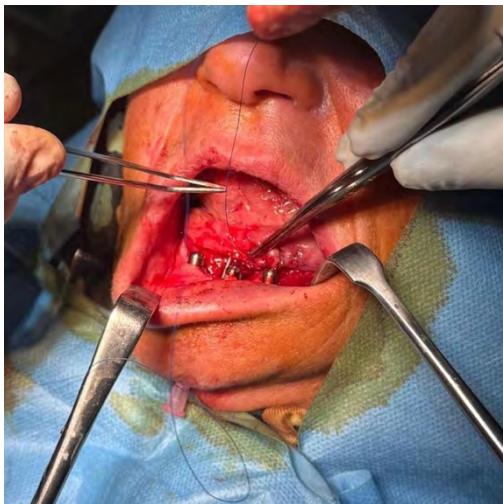


Figure 4: The suture material passed extraorally through the needle lumen and directed into the intraoral cavity



Figure 5: The suture brought out to the extraoral area and tied over an IV tubing segment (performed at four points in total)



Figure 6. Reduction of the floor of the mouth after completion of the procedure



Figure 7. The floor of the mouth modified using a guide and viscogel



Figure 8. Postoperative 1-week follow-up



Figure 9: Postoperative 2-week follow-up

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Surgical Management of SCC of Maxilla with Hemimaxillectomy

Ümit ERTAŞ, Sabuhi ABBASBAYLı, Ulvi NOVRUZOV, Habibullah Tahiroğlu

1. INTRODUCTION

Squamous cell carcinoma of the lip and oral cavity (OC) is the most common mucosal malignancy of the upper aerodigestive tract making up 85–95% of all head and neck cancers, the second most common head and neck cancer after thyroid cancer. It is frequently observed in men over 40 years old. Tobacco products, smoking, alcohol use, poor oral hygiene, poor nutrition, viral factors and chronic irritation are among the most important causes.

2. CASE REPORT

71 year old male patient was admitted to our clinic with a history of squamous cell carcinoma which was operated in 2013 via hemimaxillectomy. Visible enlargement of the tumour mass and the affected skin neighboring the nose was seen. Resection of the remainder of the maxillary bone along with affected skin was planned. A weber ferguson incision was used to gain access to operation site. Tumour body neighboring the maxillary sinus, zygomaticomaxillary buttress and the nasal septum was observed. Maxillary bone, nasal septum and the affected skin was resected via hemimaxillectomy. Patient was discharged after a total admittance of 19 days.

3. CONCLUSION

Oral cancers are generally not treated according to standard protocols and the treatment plan is created individually by evaluating the patient's age, general condition, tumor stage and histological type. Early diagnosis is also a very important factor in achieving cure in oral squamous cell carcinomas. It usually requires radical surgical treatment.

Keywords: SCC, Hemimaxillectomy, weber-ferguson incision, oral cancer, malignant tumor

Skuamöz Hücreli Karsinomun (SCC) Hemimaksillektomi ile Cerrahi Yönetimi
Ümit ERTAŞ, Sabuhi ABBASBAYLı, Ulvi NOVRUZOV

1. GİRİŞ

Skuamöz hücreli karsinom, tüm oral kanserlerin %85-95'ini oluşturan, üst sindirim ve solunum yolu en yaygın malignitesidir ve tiroid kanserinden sonra en sık görülen ikinci baş ve boyun kanseridir. Sıklıkla 40 yaş üzeri erkeklerde görülür. Tütün ürünleri, sigara, alkol kullanımı, zayıf ağız hijyeni, kötü beslenme, viral faktörler ve kronik irritasyon en önemli etiyolojik nedenler arasındadır.

2. OLGU SUNUMU

2013 yılında hemimaksillektomi yapılan skuamöz hücreli karsinom öyküsü bulunan 71 yaşında bir erkek hasta kliniğimize başvurdu. Tümör kitlesinde ve buruna komşu ciltte görünür şekilde büyümeye izlendi. Hastaya maksiller kemigin geri kalanının ve etkilenen cildin rezeksiyonu planlandı. Ameliyat alanına erişim sağlamak için Weber-Ferguson insizyonu kullanıldı. Maksiller sinüs, zygomatikomaksiller buttress ve burun septumuna komşu tümör kitlesi gözlendi. Maksiller kemik, burun septumu ve etkilenen cilt

hemimaksillektomi yoluyla rezeke edildi. Hasta, toplam 19 gün servisimizde kaldıktan sonra taburcu edildi.

3. SONUÇ

Ağzı kanserleri genellikle standart protokollere göre tedavi edilmez ve tedavi planı, hastanın yaşı, genel durumu, tümör evresi ve histolojik tipi değerlendirilerek bireysel olarak oluşturulur. Erken teşhis, ağız skuamöz hücreli karsinomlarında tam iyileşme sağlama çok önemli bir faktördür. Genellikle radikal cerrahi tedavi gerektir.

Anahtar Kelimeler: SCC, Hemimaksillektomi, Weber-Ferguson insizyonu, ağız kanseri

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COMBINED FEATURES ODONTOGENIC TUMOR: A CLINICALLY AND HISTOPATHOLOGICALLY CONTRADICTORY CASE OF AMELOBLASTOMAZehra Gülerol Aydin, Nazlı Sila Arslan, Serkan Polat

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zehra.gulerol@ibu.edu.tr**Abstract**

Objectives: This case report aims to present the clinical and histopathological features of a mandibular lesion that was initially diagnosed as an odontogenic keratocyst but later reported as an ameloblastoma upon subsequent examination. The report seeks to highlight a rare mandibular lesion presenting with histopathological findings that are contradictory for both an odontogenic keratocyst and an ameloblastoma.

Case Report: A 26-year-old female patient presented to our clinic with a complaint of a gradually increasing, painless swelling in the left mandibular premolar-molar region for approximately three months. Clinical examination revealed a notable expansion of the lingual cortex. A panoramic radiograph showed a well-defined, multilocular radiolucent lesion extending between teeth #42 and #36. Liquid content was observed in aspiration. An incisional biopsy was performed from the multilocular area between teeth 33 and 34. Initially, it was reported as consistent with odontogenic keratocyst. However, upon further evaluation following decompression, the histopathological diagnosis was revised to ameloblastoma.

Conclusion: It should be noted that the histopathological diagnosis of odontogenic tumors may not always correlate with clinical and radiological findings. In this case, the subsequent diagnosis of ameloblastoma for a lesion initially reported as an odontogenic keratocyst highlights the necessity of including odontogenic lesions with combined features in the differential diagnosis. Such diagnostic discrepancies must be considered during treatment planning, and patients should be followed up in the long term.

Keywords: Ameloblastoma, Odontogenic tumor, Cortical bone expansion, Multilocular radiolucency, Odontogenic keratocyst

1. Introduction

Ameloblastoma is a slow growing but clinically aggressive, structurally benign tumor originating from odontogenic epithelium. According to Schäfer et al. (1998), it arises from odontogenic epithelial remnants, particularly from Hertwig's epithelial root sheath (1). According to the 4th edition of the WHO Classification of Head and Neck Tumors published in 2017, ameloblastoma is classified into conventional ameloblastoma, unicystic ameloblastoma, peripheral ameloblastoma, and metastatic ameloblastoma (2). It most commonly occurs between the ages of 30 and 60 and is more frequent in males. About 80% of ameloblastomas are located in the mandible, most often in the posterior molar region. Radiographically, it usually appears as a well-defined, unilocular or multilocular, soap bubble like radiolucent and expansile lesion. A definitive diagnosis can only be established by histopathological examination (3).

In some cases, ameloblastoma may initially be reported as an odontogenic keratocyst (OKC), which may be due to the biopsy sample being taken from a specific area of the lesion or to ameloblastomatous changes in the keratocyst epithelium. Such diagnostic discrepancies may indicate a possible histogenetic relationship between ameloblastoma and OKC, as well as the presence of rare hybrid or combined odontogenic tumors.

Treatment options for OKC include marsupialization, enucleation with peripheral ostectomy, and resection (4,5). In recent studies, Castro-Núñez (2018) designed and described the active decompression and distraction sugosteogenesis technique for the management of odontogenic cystic lesions (6).

2. Case Report

A 26-year-old female patient with no systemic disease presented to our clinic with a complaint of swelling in the left lower jaw. According to the patient, the swelling had progressively increased over approximately

three months. In addition to the swelling, she complained of deviation of teeth numbered 33 and 34. No symptoms of pain or paresthesia were observed. On palpation, expansion of the bone revealed marked thinning of the lingual cortex.

Panoramic radiography showed a well-defined, multilocular lesion extending between the roots of teeth numbered 42 and 36. The mandibular canal could not be visualized within the radiolucent area of the lesion. The electric pulp test responses of teeth numbered 32, 33, and 34 were positive. CBCT examination revealed a well-circumscribed, homogeneous, multilocular, septated lesion measuring 12×37×17 mm. The lesion extended between the tooth roots superiorly, causing expansion and perforation of the lingual cortex. It also contained an invagination area with a horizontal width of 5.4 mm and had caused root resorption in tooth number 33. The differential diagnosis included odontogenic keratocyst, ameloblastoma, traumatic bone cyst, central giant cell granuloma, and odontogenic myxoma. Following flap elevation, an incisional biopsy was obtained from the most characteristic multilocular area of the lesion, located between teeth 33 and 34 and the specimens were submitted for histopathological examination. During the incisional biopsy, the cystic epithelium was observed to be thin and fragile. Histopathological evaluation of the incisional biopsy specimens favored a diagnosis of odontogenic keratocyst. Considering the lesion's size, proximity to the mandibular canal, and the necessity for aggressive curettage, a 'modified distraction sugosteogenesis technique' followed by cyst excision was adopted as the treatment approach. Under local anesthesia, a decompression tube was placed through the buccal region into the cavity at the apical level of teeth 35 and 36. Decompression was maintained for two months, after which the tube was removed. The patient was recalled for follow-up every 15 days and instructed to irrigate the cavity twice daily with normal saline. In addition, the patient was instructed to continue negative pressure drainage overnight using a hemovac system. Radiographic follow-up demonstrated a significant reduction in radiolucency within the lesion area, with decreased lesion margins consistent with new bone formation. At the end of the second month, the lesion was completely enucleated, and the cystic borders were thoroughly curetted. During the same procedure, teeth numbered 34 and 35, which interfered with lesion removal, were extracted. Histopathological examination of the entire cystic epithelium revealed a diagnosis of classic ameloblastoma. Over a one-year postoperative follow-up period, radiographic evaluation showed evidence of bone healing in the affected region, with no recurrence detected to date. The patient remains under regular follow-up.

3. Discussion

In this case, a multilocular, radiolucent, and expansile lesion was observed in the mandible. The initial biopsy was reported as an odontogenic keratocyst, but further evaluations led to a diagnosis of ameloblastoma. This histopathological discrepancy may be attributed to the heterogeneous nature of the lesion or to the fact that odontogenic tumors can sometimes exhibit combined or hybrid characteristics. In similar cases reported in the literature, lesions initially diagnosed as keratocysts were later identified as ameloblastoma or keratoameloblastoma (7, 8).

The rarity of combined odontogenic lesions limits the amount of data available for treatment planning; however, treatment is generally based on the more aggressive neoplasm among the lesions (7). Many authors suggest that hybrid odontogenic lesions do not result from the collision of two separate entities but rather develop due to the multipotential nature of odontogenic epithelium, with both lesions likely originating from a common source (9). According to some authors, this explanation may apply to ameloblastoma associated with OKC; however, in such cases, ameloblastoma and OKC may represent two distinct entities that arise almost simultaneously within the same region.

4. Conclusion

In this case, a lesion initially reported as an odontogenic keratocyst was later identified as a classic ameloblastoma during the treatment process, underscoring the importance of accurate diagnosis and appropriate treatment planning.

The active decompression and distraction sugosteogenesis technique provides an effective and conservative approach that allows simultaneous pressure reduction and bone regeneration in cystic lesions. This method offers significant advantages in managing large lesions by minimizing surgical morbidity while preserving functional and aesthetic outcomes.

Long-term follow-up remains essential for early detection of possible recurrences and assessment of treatment success.

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6. Figures



Figure 1. Preoperative panoramic radiograph.



Figure 2. Postoperative view after placement of the decompression tube

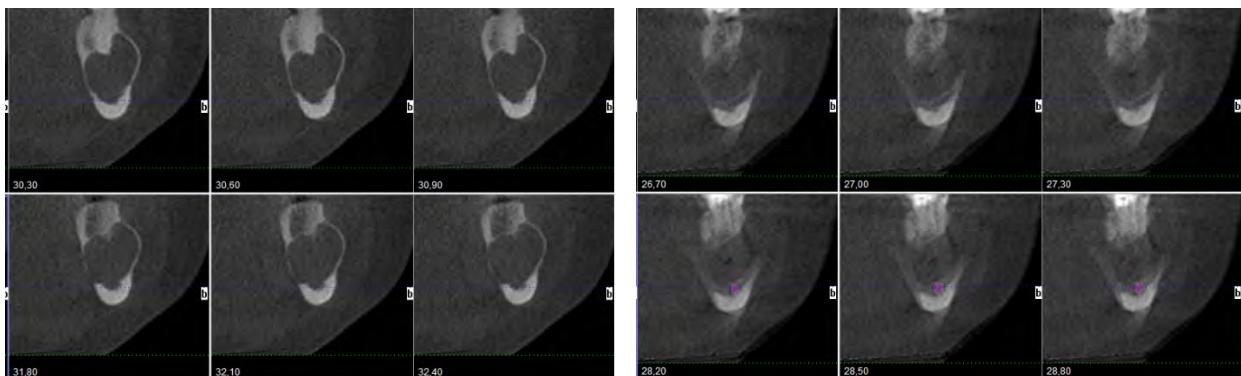


Figure 3. Pre- and post-decompression CBCT views



Figure 4. Postoperative panoramic radiograph.



Figure 5. One-year postoperative intraoral view

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SUPERNUMERARY TEETH AND DENTIGEROUS CYSTS ASSOCIATED WITH IMPACTED WISDOM TEETH IN THE MAXILLA AND MANDIBLEBatuhan Aydin, Zehra Gülerol Aydin, Ceren Atalay, Serkan Polat

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Abstract

Objective: Dentigerous cysts are benign, slow-growing, and developmentally mediated odontogenic cysts. The aim of this case report is to describe the simultaneous association of dentigerous cysts involving more than one quadrant with impacted wisdom teeth and supernumerary teeth in the same patient without a syndromic background.

Case Report: A 23-year-old female systemically healthy patient presented to our clinic for the extraction of impacted wisdom teeth. As a result of clinical and radiographic examination, a radiolucent lesion with sclerotic borders and displacing teeth associated with impacted supernumerary teeth and impacted wisdom teeth was detected in the patient's left maxilla and mandible. The cystic lesion in the maxilla and the impacted supernumerary teeth were in close contact with the maxillary sinus. The cystic lesion and the impacted teeth in the mandible were in close contact with the inferior alveolar nerve. Under local anesthesia, the supernumerary teeth accompanying the #28, #38 and both impacted wisdom teeth were extracted. The cystic lesions in the affected region were enucleated. No oroantral contact was detected in the maxilla. The inferior alveolar nerve integrity was preserved in the mandible. Biopsy samples were sent to pathology for examination. Histopathology revealed a dentigerous cyst.

Conclusion: Dentigerous cysts are benign lesions that often occur in association with impacted permanent teeth. It should be noted that lesions associated with supernumerary teeth in multiple quadrants can also develop in individuals without the syndrome. Therefore, early panoramic imaging, appropriate surgical excision, and histopathological confirmation are crucial.

Keywords: Dentigerous cyst, Supernumerary impacted tooth, Cyst enucleation

1. Introduction

Dentigerous cysts are benign, slow-growing odontogenic cysts of developmental origin (1). It is seen more than twice as often in men as in women and usually occurs in individuals between the ages of 20 and 40 (2). These cysts occur almost exclusively in permanent teeth, with approximately 70% of cases occurring in the mandible. Mandibular third molars and maxillary third molars are most frequently affected (3,4). Pathogenesis is thought to involve the accumulation of fluid between the crown of an unerupted tooth and its reduced enamel epithelium, which increases hydrostatic pressure, separates the follicle from the surrounding bone at the cemento-enamel junction, and results in progressive expansion of the follicular space into a cystic cavity (5). Dentigerous cysts can reach very large sizes. Radiographically, a dentigerous cyst typically appears as a well-circumscribed, unilocular radiolucent lesion with a thin sclerotic margin that envelops the crown of an unerupted permanent tooth (6). Management depends on the size and location of the lesion and on the prognosis of the involved tooth, and may include complete enucleation of the cystic lining together with extraction of the associated impacted tooth, or a more conservative approach such as marsupialization/decompression (7,8).

2. Case Report

A 23-year-old female systemically healthy patient presented to our clinic for the extraction of impacted wisdom teeth. As a result of clinical and radiographic examination, a radiolucent lesion with sclerotic borders and displacing teeth associated with impacted supernumerary teeth and impacted wisdom teeth was detected in the patient's left maxilla and mandible (Fig. 1). The cystic lesion in the maxilla and the impacted supernumerary teeth were in close contact with the maxillary sinus. The cystic lesion and the impacted teeth in the mandible were in close contact with the inferior alveolar nerve. Under local

anesthesia, the supernumerary teeth accompanying the #28, #38 and both impacted wisdom teeth were extracted. The cystic lesions in the affected region were enucleated (Fig 2,3). No oroantral contact was detected in the maxilla. The inferior alveolar nerve integrity was preserved in the mandible. Biopsy samples were sent to pathology for examination. Histopathological examination revealed a thin, non-keratinizing stratified squamous epithelium lining the lesion wall, with a cyst capsule composed of fibrous connective tissue beneath the epithelium. No significant keratinization or epithelial atypia was observed. The findings are consistent with a dentigerous cyst. A 3-month follow-up radiograph revealed ossification of the defect area (Fig. 4).

3. Discussion

Dentigerous cysts are the second most common type of odontogenic cysts after radicular cysts (2). In this case, the association of dentigerous cyst with impacted wisdom teeth and supernumerary teeth in both the mandible and maxilla is a rare condition reported in the literature. Dentigerous cysts are often asymptomatic and, if left untreated, can lead to destruction due to jaw bone expansion and cortical thinning, displacement, and malposition of adjacent teeth. In very rare cases, the cyst epithelium may exhibit neoplastic changes that can progress to ameloblastoma or even malignant lesions (9,10). Therefore, early diagnosis and treatment are of great importance. Treatment options include enucleation, marsupialization, or a combination of these methods. Enucleation is preferred for small to medium-sized cysts, while marsupialization can be used to reduce the risk of jaw fracture, especially in larger lesions (11,12). In this case, due to the medium size of the cyst, cyst enucleation was preferred along with extraction of the impacted wisdom teeth and supernumerary teeth.

Dentigerous cysts are typically solitary cysts that develop around the follicle of a single impacted permanent tooth. They are most commonly associated with mandibular third molars. However, simultaneous dentigerous cyst formation in multiple quadrants has been reported in both syndromic and non-syndromic cases (13,14). In non-syndromic cases, this condition is usually described as bilateral or multifocal cysts and sometimes associated with supernumerary teeth (15,16). In syndromic cases, particularly cleidocranial dysplasia, multiple dentigerous cysts associated with the presence of multiple impacted permanent and supernumerary teeth have been frequently reported. In these patients, cysts affecting all jaw quadrants and developing around multiple impacted and supernumerary teeth can be observed simultaneously (17). In cases of Maroteaux–Lamy syndrome (mucopolysaccharidosis type VI), multiple impacted teeth and delayed eruption, along with dentigerous cysts involving multiple quadrants of the mandible and maxilla, have been reported to be observed simultaneously in the same patient (18). In this case, which had no clinical or radiological findings of cleidocranial dysplasia, mucopolysaccharidosis, or other craniofacial dysplasias, a multifocal dentigerous cyst was observed.

4. Conclusion

Although dentigerous cysts are generally asymptomatic, they can lead to serious complications if left untreated. Therefore, early diagnosis and appropriate surgical management are crucial. In the presented case, multiple dentigerous cysts associated with impacted wisdom teeth and supernumerary teeth were successfully treated by extraction of the involved teeth and enucleation of the cysts. At three-month follow-up, bone healing began at the lesion site. This case demonstrates that dentigerous cysts may arise in multiple locations and involve more than one impacted tooth, even in non-syndromic patients without any underlying systemic or craniofacial disorder.

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6. Figures



Figure 1: Panoramic radiograph shows cystic lesions around impacted third molars and supernumerary teeth.



Figure 2: The supernumerary teeth associated with teeth 28 and 38, as well as both impacted third molars, were extracted.



Figure 3: The cystic lesions in the affected region were enucleated.



Figure 4: Follow-up panoramic radiograph 3 months later shows ossification in the cyst areas.

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DENTIGEROUS CYST ASSOCIATED WITH PERMANENT TEETH IN A PEDIATRIC CASE

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Abstract

Objective: Dentigerous cysts surround the crown of an unerupted/impacted tooth and are attached to the tooth at the cemento-enamel junction. They are one of the most common odontogenic developmental cysts. Most cases are asymptomatic and are discovered incidentally on routine radiographs. In mixed dentitions, delayed permanent teeth and the spread of inflammation to the follicle from decayed primary teeth should be closely monitored for dentigerous cyst development.

Case: A 12-year-old, systemically healthy patient presented for a routine dental examination. A panoramic radiograph taken during the routine examination revealed a well-defined, well-contoured, unilocular radiolucent lesion in the left posterior mandible, originating from the crown of #35 and extending to the base of the mandible. Following ostectomy of the mandibular cortical bone, the cystic cavity was exposed. The cyst cavity contained the distal portion of the crown of premolar tooth 35 and the periapical region of the involved tooth. To allow #35 to continue developing, the degenerative tissue surrounding the cyst was excised, preserving the dental follicle. A drain was placed in the cyst cavity and removed after 1 month. During this period, the patient's affected area was irrigated with saline at regular intervals.

Histopathological evaluation confirmed the preliminary diagnosis of a dentigerous cyst.

Conclusion: Dentigerous cysts can be asymptomatic, particularly in individuals with mixed dentition, and are often discovered incidentally during routine radiographic examinations. Early diagnosis and appropriate surgical treatment are crucial for preventing complications such as root resorption, tooth eruption disorders, and pathological fractures.

Keywords: Dentigerous cyst, Pediatric case, Mandible

1. Introduction

Dentigerous cysts are the second most common type of odontogenic cyst, developing around the crowns of impacted or unerupted teeth, after radicular cysts. They are mostly of developmental origin and are considered to result from fluid accumulation between the dental follicle and the crown (1). According to the classification updated by the World Health Organization (WHO) in 2022, dentigerous cysts are classified as developmental odontogenic cysts. They constitute approximately 20% of all jaw cysts (2). They are usually observed in the posterior region of the mandible and the maxillary canine region. The teeth most commonly affected are the third molars of the mandible (3).

The lesions are often asymptomatic and are discovered incidentally during routine radiographic examinations as well-defined, unilocular radiolucent areas surrounding the crown of an impacted tooth. However, when the cyst size exceeds 2 cm, cortical bone expansion, tooth displacement, or, rarely, resorption may be observed (4). Histopathologically, the walls of dentigerous cysts are lined with a thin fibrous connective tissue, and the inner surface is usually lined with a 2–4-cell-thick, nonkeratinizing stratified squamous epithelium. While dentigerous cysts are most commonly seen in association with permanent teeth, they may also occasionally be associated with primary or supernumerary teeth (5). This condition can have significant clinical consequences, particularly in children with mixed dentition, due to their proximity to the permanent tooth germs. Early diagnosis and appropriate surgical intervention are crucial for preserving the eruption pattern of the permanent teeth.

2. Case Report

A 12-year-old systemically healthy pediatric patient presented for a routine dental examination. A panoramic radiograph taken during the routine examination revealed a well-defined, well-contoured, unilocular radiolucent lesion in the left posterior mandible, originating from the crown of tooth #35 and

extending to the base of the mandible (Fig. 1). A thin, sclerotic border was observed around the lesion. The cystic lesion was also connected to the inferior alveolar nerve, the mental nerve, and the roots of teeth #34 and #36. Electrical vitality tests revealed vital responses for these teeth. The radiological findings were consistent with a dentigerous cyst, and surgical enucleation was planned. Under local anesthesia, access was gained by elevating a mucoperiosteal flap to the surgical site. Following osteotomy of the mandibular cortical bone, the cystic cavity was exposed. The cyst cavity included the distal portion of the crown of premolar #35 and the periapical region of the corresponding tooth. The cystic lesion had well-defined walls, and aspiration of the cyst contents yielded clear, straw-yellow fluid. The cystic lesion displaced tooth #35 lingually. The connection between tooth #35 and the bone was limited to a lingual area. The degenerative tissue within the cyst was excised, preserving the dental follicle to allow tooth #35 to continue developing. The integrity of the inferior alveolar nerve and mental nerve was preserved. The cystic tissue obtained after surgery was submitted for histopathological examination. A drain was placed in the bone cavity (Fig. 2). During this period, the cyst cavity was irrigated with isotonic saline solution at regular intervals. The goal of this protocol is to minimize surgical morbidity and reduce the incidence of injury to associated structures such as the inferior alveolar nerve, mental nerve, and developing teeth. The drain was removed after one month.

Histopathological examination revealed a cystic structure lined with thin, nonkeratinized stratified squamous epithelium, with fibrous connective tissue lining and minimal inflammatory cell infiltration. These findings confirmed the preliminary diagnosis of a dentigerous cyst.

A panoramic radiograph taken at the follow-up appointment three months later revealed prominent bone regeneration progressing from the periphery to the center of the cystic space. Spontaneous eruption of the permanent tooth associated with the cyst was observed (Fig. 3).

3. Discussion

Dentigerous cysts develop due to the gradual enlargement of cystic fluid that accumulates between the follicle of an unerupted tooth and its crown. When the distance between the crown and follicle exceeds 5 mm, a dentigerous cyst should be suspected (6). The differential diagnosis includes odontogenic keratocyst, unicystic ameloblastoma, central giant cell granuloma, and large radicular cysts (7).

Dentigerous cysts are most commonly observed during the third and fourth decades of life (8), with lower frequency in the second decade, as in this case. According to Zhang et al., dentigerous cyst is among the most frequently encountered odontogenic cysts in children (9).

Because dentigerous cysts are generally asymptomatic, they are often diagnosed incidentally during routine dental check-ups. They are frequently associated with eruption disturbances due to interference with tooth eruption. Rarely, they may enlarge and cause expansion of adjacent bone. The most common symptom is paresthesia of the inferior alveolar nerve (10). In the present 12-year-old patient, the cyst interfered with the eruption path of tooth #35. While dentigerous cysts usually appear as unilocular radiolucencies, rare multilocular or scalloped border variants have been reported (11), particularly in patients with basal cell nevus syndrome, mucopolysaccharidosis, or cleidocranial dysplasia (12). They occur most commonly in the mandible (70%) and less frequently in the maxilla (30%) (8).

Treatment planning for dentigerous cysts depends on factors such as cyst size, location, whether the associated tooth will be extracted, and follow-up possibilities. In pediatric patients, treatment options include complete enucleation with primary closure or marsupialization. Marsupialization is preferred in young patients when preservation of displaced, developing teeth is desired (13). In this case, the cystic contents were removed carefully without damaging the follicle of tooth #35 to allow its eruption.

4. Conclusion

Dentigerous cysts in mixed dentition often remain asymptomatic and are frequently detected incidentally on routine radiographs. Early diagnosis and appropriate surgical management are crucial to prevent complications such as root resorption, eruption disturbances, and pathological fractures. In this case, careful enucleation and follow-up resulted in successful bone regeneration in the affected area and spontaneous eruption of the permanent tooth.

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6. Figures



Figure 1: Preoperative orthopantomogram



Figure 2: Cyst excision and drain placement while preserving the follicle of the permanent tooth



Figure 3: Postoperative 3 months later orthopantomogram

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**INTRUSIVE LUXATION OF A PERMANENT MAXILLARY INCISOR WITH NASAL FLOOR MIGRATION
IN AN ADOLESCENT PATIENT**

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Abstract

Objectives: This case report presents a rare instance of complete intrusion of a permanent maxillary incisor into the nasal floor following a fall from ladder. The report details the clinical and radiographic findings, as well as the management approach, including strategies to prevent complications and ensure optimal tooth prognosis. The case highlights the importance of careful evaluation, timely intervention, and appropriate follow-up in severe dental trauma, offering practical insights for clinicians facing similar injuries.

Case report: A 15-year-old male patient presented to our clinic with a complaint of avulsion of the right maxillary permanent central incisor after being struck in the upper jaw by a folding ladder. Clinical and tomographic evaluation revealed that the left maxillary permanent central incisor had intruded and displaced into the nasal floor. The tooth in question was directly approached and extracted under local anesthesia. Following reduction, the tooth was splinted to the adjacent healthy teeth.

Conclusion: Intrusive luxation cases require careful evaluation with clinical examination, radiographs, and when necessary, computed tomography to ensure an accurate diagnosis and support a better prognosis for the affected tooth. This case highlights the importance of promptly guiding parents, teachers, and caregivers to seek specialized care, as timely intervention can significantly reduce complications and long-term damage associated with such dental trauma.

Key words: Intrusion, nasal cavity, permanent dentition, tooth dislocation, tooth injuries

1. Introduction

Dental traumas are common during adolescence and childhood, and the most frequently affected teeth are the maxillary incisors (1). Intrusive luxation is one of the severe traumatic injuries that results in the partial or complete displacement of the tooth in the apical direction. Its etiology generally includes falls from height and bicycle accidents (2).

The diagnosis of these cases requires caution, as they may be confused with tooth avulsions (3). Therefore, clinical observation, periapical, occlusal, and panoramic imaging, as well as computed tomography, are important for determining the position of the displaced tooth. Displacement of permanent teeth into the nasal floor is rare, and early diagnosis is crucial since it may lead to complications such as nasal airway obstruction, infection, and bleeding. Although there is no consensus on the best treatment method for intrusive luxation, the International Association of Dental Traumatology (2020) recommends spontaneous re-eruption for teeth with incomplete root development (4).

2. Case Report

A 15-year-old male patient undergoing orthodontic treatment presented to our clinic with a complaint of avulsion of tooth #11 after being struck in the upper jaw by a folding ladder the previous day. A radiographic examination was recommended to rule out the possibility of aspiration or ingestion of tooth #11, the missing brackets, and the archwire, which were not present on the other teeth. The patient's tetanus vaccination status was confirmed. On the panoramic radiograph, tooth #21 was observed to have intruded and migrated into the nasal cavity by perforating the nasal floor (Fig. 1,3). CBCT revealed a fracture in the buccal plate in the #11–21 region, as well as fractures in the anterior maxillary bone cortex

and the anterior nasal spine (Fig.2). A bone fragment corresponding to the level of the buccal bone plate was fixated with a mini-screw under local anesthesia. Tooth #21, which had migrated into the nasal cavity, was surgically exposed through a mucoperiosteal flap raised from the buccal region extending from teeth #14 to #24 and was extracted from the nasal floor. Tooth #21 was then reimplanted into its socket. To protect it from occlusal trauma, the tooth was positioned in infraocclusion relative to its normal alignment. Since the patient was undergoing orthodontic treatment, brackets were also placed on teeth #12, #13, #21, and #22 in addition to the existing ones, and the tooth was stabilized with an archwire. Amoxicillin-clavulanic acid was prescribed according to the routine regimen. Endodontic treatment of the tooth was carried out within two weeks.

3. Discussion

After trauma, teeth may be displaced to various parts of the body. The most common sites of displacement are the oral cavity, the sinus, and the stomach (5). What distinguishes this case from other dental trauma reports in the literature is that the displaced tooth was a permanent incisor and that it perforated the nasal floor, ultimately locating within the nasal cavity. Displacement of this magnitude is exceedingly rare and adds significant complexity to both diagnosis and management.

Moreover, in cases presenting as avulsion or severe intrusion, achieving an accurate diagnosis can be particularly challenging. Early recognition is crucial, as delayed or missed diagnosis may increase the risk of complications, including infection, impaired eruption, or damage to adjacent structures. Intrusion of permanent teeth is often accompanied by alveolar bone fractures (5); however, in young patients, the spongy architecture of the alveolar bone may reduce the likelihood of such fractures, which aligns with our observation in this patient.

Notably, this case also differs from existing literature in terms of the fracture observed in the buccal bone, highlighting the importance of comprehensive radiographic evaluation, including CBCT, to identify subtle bone involvement. Such detailed assessment ensures that clinicians can plan an individualized treatment strategy, anticipate potential complications, and optimize the prognosis of the affected tooth.

Taken together, this case underscores the rarity and clinical significance of severe intrusive luxation with nasal floor perforation and reinforces the importance of meticulous clinical and radiographic examination in guiding both diagnosis and treatment.

4. Conclusion

Intrusive luxation represents a serious dental injury that demands meticulous clinical and radiographic assessment. Timely diagnosis and intervention are critical for preserving the long-term prognosis of the affected tooth. This case underscores the imperative for caregivers, including parents and educators, to promptly seek specialized dental consultation following trauma, as delayed management can substantially compromise treatment outcomes.

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6. Figures

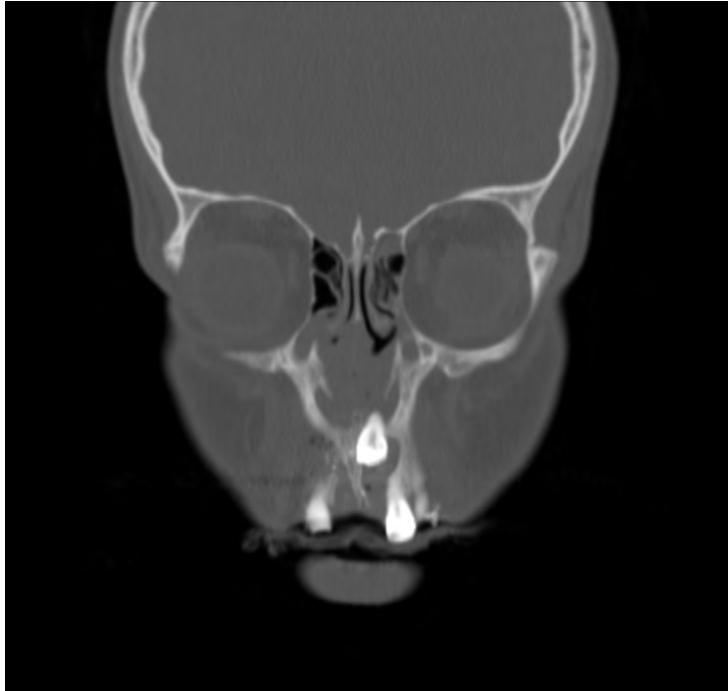


Figure 1: Post-traumatic CBCT image.



Figure 2: Post-traumatic CBCT image showing a fracture at the anterior nasal spine (ANS).

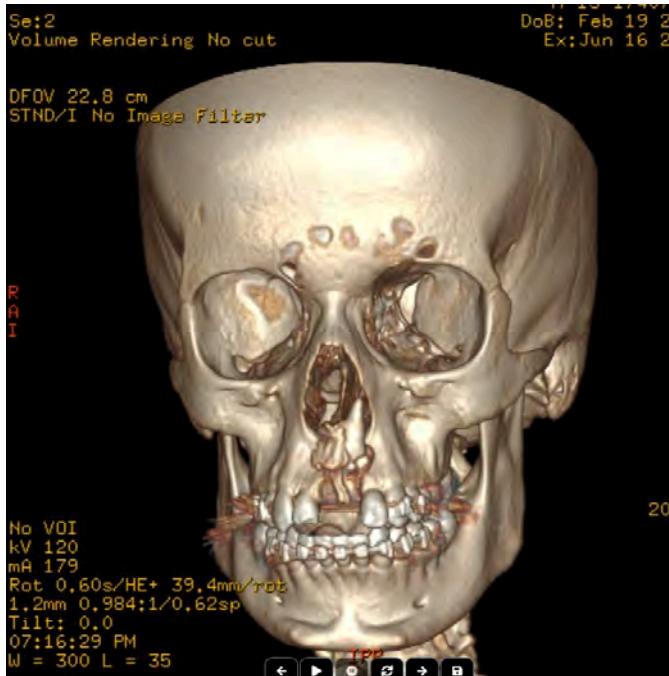


Figure 3: Position of the displaced tooth in the nasal cavity.

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CONSERVATIVE MANAGEMENT OF AN ANTERIOR NASAL SPINE FRACTURE WITH POST-TRAUMATIC INTRUSIVE LUXATION OF A MAXILLARY CENTRAL INCISOR INTO THE NASAL FLOORBatuhan Aydin, Nazlı Sıla Arslan, Serkan PolatBolu Abant İzzet Baysal University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery,
Bolu/Turkeydt.batuhanaydin@gmail.com**Abstract**

Objective: This case report presents the complete intrusion of a permanent incisor into the nasal floor in the maxillary anterior region as a result of a fall from stairs and its treatment. Clinical and radiographic findings will be presented, along with the management of dentoalveolar trauma cases, possible complications during follow-up, and contributions to similar cases.

Case: A 15-year-old male patient presented to our clinic with a complaint of avulsion of the right maxillary permanent central incisor after as a result of a fall from stairs. Clinical and radiographic examination revealed that the left maxillary permanent central incisor had intruded and displaced into the nasal floor. Right maxillary permanent central incisor was avulsed. Axial imaging revealed a fracture of the anterior nasal spine (ANS). The tooth, which had migrated to the nasal floor, was repositioned. To prevent disruption of the periosteal blood supply to the ANS fragment, it was fixed to the maxilla with miniscrew using a flapless approach. Following reduction, the tooth was splinted to the adjacent healthy teeth.

Conclusion: Intrusive luxation cases require careful evaluation with clinical examination, radiographs, and when necessary, computed tomography to ensure an accurate diagnosis and support a better prognosis for the affected tooth. Trauma can affect not only the dental structures but also the surrounding soft and bony tissues.

Keywords: Trauma, Nasal floor perforation, ANS fracture, Intrusive luxation

1. Introduction

Dental traumas are common during adolescence and childhood, and the most frequently affected teeth are the maxillary incisors (1). Intrusive luxation is one of the severe traumatic injuries that results in the partial or complete displacement of the tooth in the apical direction. Its etiology generally includes falls from height and bicycle accidents (2).

The diagnosis of these cases requires caution, as they may be confused with tooth avulsions (3). Therefore, clinical observation, periapical, occlusal, and panoramic imaging, as well as computed tomography, are important for determining the position of the displaced tooth. Displacement of permanent teeth into the nasal floor is rare, and early diagnosis is crucial since it may lead to complications such as nasal airway obstruction, infection, and bleeding. Although there is no consensus on the best treatment method for intrusive luxation, the International Association of Dental Traumatology (2020) recommends spontaneous re-eruption for teeth with incomplete root development (4).

2. Case Report

A 15-year-old male patient undergoing orthodontic treatment presented to our clinic with a complaint of dislocation of anterior teeth after as a result of a fall from stairs previous day. Radiographic examination revealed that #21 had perforated the nasal floor and intrusive luxation into the nasal cavity, while #11 was avulsed (Fig. 1,3). Aspiration of #11, the missing brackets, and the missing archwire were excluded by radiographic examination. CBCT imaging revealed a fracture of the anterior nasal spine (ANS), buccal plate in the #11–21 region and septal deviation (Fig. 2). Under local anesthesia, the tooth, which had migrated to the nasal floor, was repositioned intranasally using a periosteal elevator. To prevent disruption of the periosteal blood supply to the ANS fragment, it was fixed to the maxilla with miniscrew using a flapless approach. Tooth #21 was then reimplanted into its socket (Fig. 4). After reimplantation,

improvement in septal deviation was noted on inspection. To protect it from occlusal trauma, the tooth was positioned in infraocclusion relative to its normal alignment. Since the patient was undergoing orthodontic treatment, brackets were also placed on teeth #12, #13, #21, and #22 in addition to the existing ones, and the tooth was stabilized with an archwire. Endodontic treatment of the tooth was performed within two weeks. No infection was observed in the postoperative period. After 3 months, ossification of the bone fragments was observed in CBCT examinations. The miniscrew used to fix the ANS was removed after 3 months. After 3 months, tooth #21 was stable in the maxillary arch (Fig. 5).

3. Discussion

After trauma, teeth may be displaced to various parts of the body. The most common sites of displacement are the oral cavity, the sinus, and the stomach (5). The findings that distinguish this case from other dental trauma cases in the literature are that the displaced tooth was a permanent tooth and that it perforated the nasal floor and was located in the nasal cavity. Displacement of this extent is rare. Moreover, in cases presenting as avulsion or severe intrusion, making an accurate diagnosis becomes more challenging. Intrusion of permanent teeth is often accompanied by alveolar bone fractures (5), but in young patients, due to the spongy structure of the bone, alveolar fractures are less common. This case also differs from the literature in terms of the fracture observed in the ANS. Isolated ANS fractures are relatively rare and may be overlooked due to their small size and midline location (6). In this case, the anterior nasal spine fracture and intrusive luxation of the incisor tooth into the nasal floor, seen in the same case, reveal the severe impact of the trauma on the maxillary and nasal structures and the complex anatomical relationships.

4. Conclusion

Intrusive luxation cases require careful clinical and radiographic examination. Early diagnosis and appropriate treatment improve the prognosis of the tooth and bone fragments. Periosteal blood supply of small bone fragments is important for bone regeneration. Aspiration or ingestion of avulsed tissues and/or foreign bodies may occur after trauma. These possibilities should be excluded with appropriate imaging. Displacement of permanent teeth into the base of the nose is a rare condition. Early diagnosis and treatment are important as it can lead to complications such as nasal airway obstruction, septal deviation, infection, and bleeding.

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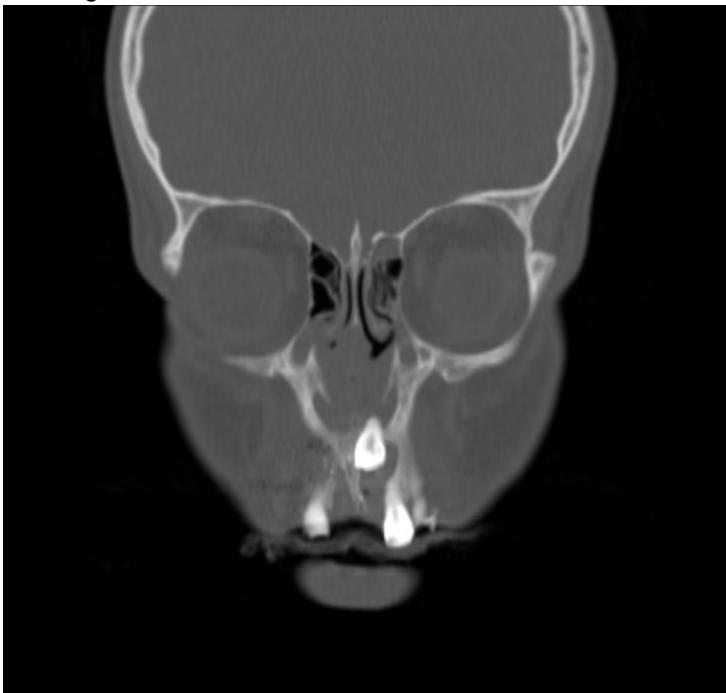


Figure 1: Post-traumatic CBCT image

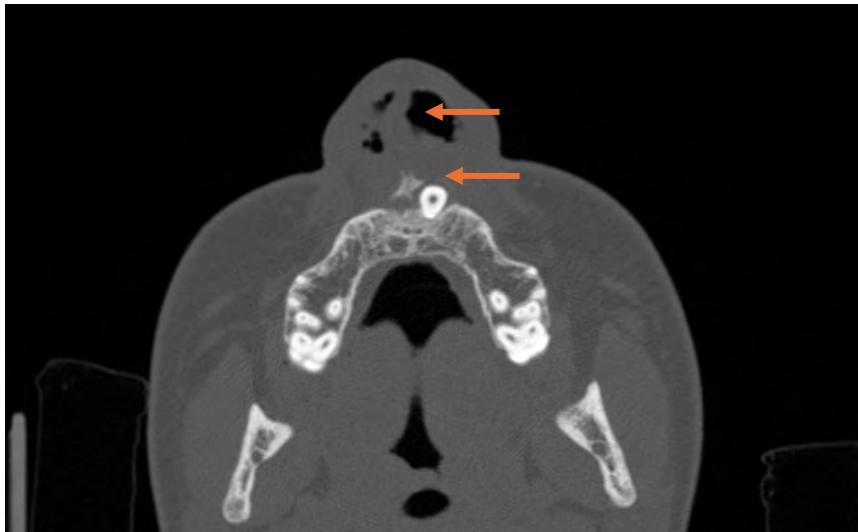


Figure 2: Fracture of the anterior nasal spine (ANS), buccal plate in the #11–21 region and septal deviation.

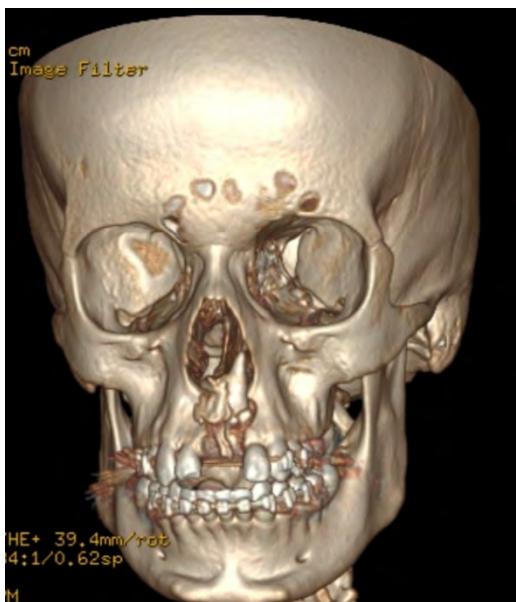


Figure 3: Location of the intrusive luxated tooth in the nasal cavity

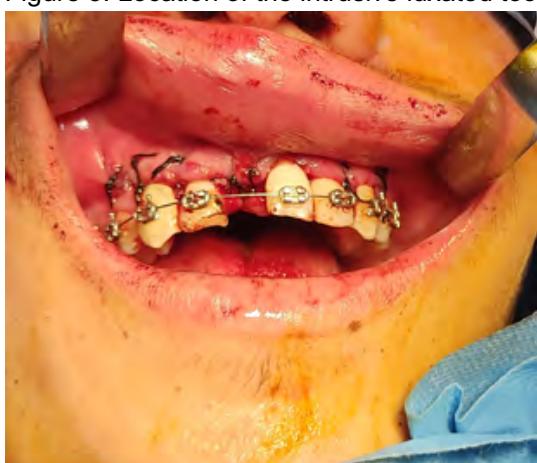


Figure 4: Tooth #21 was reimplanted into its socket



Figure 5: Postoperative 3 months view

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SUBMANDIBULAR SPACE ABSCESS SECONDARY TO MULTIPLE MANDIBULAR FRACTURES: A CASE REPORTBatuhan Aydin, Yusuf Polat, Serkan Polat

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Abstract

Objective: Mandibular fractures are common injuries encountered in maxillofacial trauma practice. Multiple fracture cases, while less common than single-site fractures, represent a significant portion of the literature. However, delayed intervention requires caution due to the risk of infection and potential complications. This case highlights the importance of evaluating submandibular abscess development in cases where the third molar is involved in the mandibular angulus fracture line.

Case: A 40-year-old systemically healthy patient presented with a fracture to the lower jaw due to a blow to the jaw following a fight. Clinical and radiographic examination revealed multiple fractures in the right parasymphysis and left angulus regions of the mandible. Angulus fracture was associated with the impacted wisdom tooth and the inferior alveolar nerve. On the third postoperative day, signs of cellulitis were detected in the patient's left submandibular region. Despite the cellulitis-like swelling, intraoral and extraoral drainage was established under appropriate antibiotic therapy to prevent purulent dissolution and dangerous spread, and drains were placed in both areas. The impacted wisdom tooth was extracted due to the suspicion of being a source of infection. After the infection was controlled, open reduction and internal fixation were performed. The arch bars were removed after the patient achieved natural occlusion.

Conclusion: Early stabilization and/or rigid fixation of mandibular fractures have potential to reduce the risk of infection, particularly in tooth-supported areas. Impacted wisdom teeth may pose a risk for microbial contamination. Therefore, the fracture line and tooth relationship should be carefully evaluated.

Keywords: Trauma, Mandibular fracture, Submandibular abscess, Rigid fixation

1. Introduction

Mandibular fractures are common injuries in maxillofacial trauma practice, representing approximately 36% to 59% of all facial fractures (1). While there are differences in anatomical location among studies, some series have identified the angulus, body, and parasymphysis/symphysis regions as the most common sites of fractures. For example, in a large retrospective study, the angulus region was the most common site of mandibular fractures at 28.84%, while the parasymphysis was reported at a lower rate of 17.38% (2). Although cases with multiple fractures are rarer than single-site fractures, they have a significant share in the literature. For example, a 7-year retrospective study found a single fracture in 69.7% of patients and multiple fractures in 30.3% (3). In terms of treatment strategies, open reduction and internal fixation (ORIF) is considered the "gold standard" in many studies and is preferred due to its advantages of stabilization, early functional recovery, and early mobilization (4). However, delayed intervention requires caution due to the risk of infection and potential complications (5). In this case report, we will present the early development of submandibular abscess and subsequent rigid internal fixation approach in a patient with multiple fractures in the parasymphysis and angulus regions of the mandible.

2. Case Report

A 40-year-old systemically healthy patient presented with a fracture to the lower jaw due to a blow to the jaw following a fight. Clinical examination revealed mobility of the fragments, malocclusion and swelling in the submandibular region. The patient had moderate sensory loss in the left lip and chin. Clinical and radiographic examination revealed multiple nondisplaced fractures in the right parasymphysis and left angulus regions of the mandible (Fig. 1, 2). In CBCT examination angulus fracture was associated with

the impacted wisdom tooth and the inferior alveolar nerve. Intermaxillary fixation was achieved with arch bars and elastics in appropriate occlusion (Fig. 3). Due to the patient's severely limited mouth opening, the possibility of tracheostomy during general anesthesia was considered a risk by the relevant department, so we operated on the patient under local anesthesia. Due to inadequate mouth opening, only the parasymphysis fracture was fixed with two miniplates (Fig. 4). Surgical access to the angulus region could not be achieved under local anesthesia due to limited mouth opening. On the third postoperative day, signs of cellulitis were detected in the patient's left submandibular region (Fig. 5). Despite the cellulitis-like swelling, intraoral and extraoral drainage was established under appropriate antibiotic therapy to prevent purulent dissolution and dangerous spread, and drains were placed in both areas. Because drains and antibiotics were insufficient to resolve the abscess, the impacted wisdom tooth was removed after odontosection due to suspicion that it might be a source of infection. After the infection was brought under control, the fracture in the angle of mandible region was reduced openly from the external oblique ridge and internal fixation was performed with a single mini plate (Fig. 6). After the patient reached natural occlusion, arch bars were removed.

3. Discussion

This case presented clinical challenges due to the presence of an impacted wisdom tooth associated with a fracture localized in the mandibular angle region, the close relationship of the fracture line to the inferior alveolar nerve, the presence of multiple fractures, and the development of a submandibular abscess in the early postoperative period. Optimal timing of stabilization, surgical planning, and complication management are crucial in multiple mandibular fractures. Early stable internal fixation can reduce the risk of infection by minimizing fracture mobility (6). It has been reported in the literature that open reduction of fractures after 72 hours is considered as "late intervention" and that this may increase infection rates in the surgical field (5). Additionally, fracture sites associated with teeth may increase the potential for infection. This poses an additional risk factor, particularly in cases where delayed stabilization is planned. Surgical management principles for infected mandibular fractures include drainage, appropriate antibiotic therapy, debridement, and fracture stabilization. The ORIF technique can be used in infected fractures with careful evaluation and appropriate surgical approach (7). Studies on infection risk factors in mandibular fractures have shown that factors such as open fracture, delayed reduction, health status, presence of necrotic bone and smoking are factors that increase complication rates (7,8).

4. Conclusion

Early stabilization and/or rigid fixation of mandibular fractures have potential to reduce the risk of infection, particularly in tooth-supported areas. Impacted wisdom teeth may pose a risk for microbial contamination. Therefore, the fracture line and tooth relationship should be carefully evaluated. Internal reduction and rigid fixation approaches applied after infection control is achieved in the late period may be successful.

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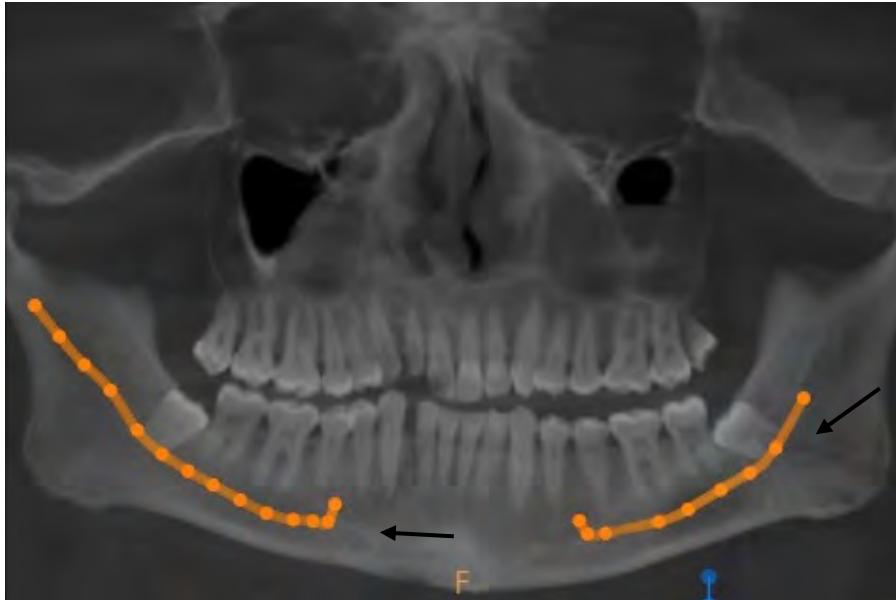


Figure 1: Preoperative CBCT

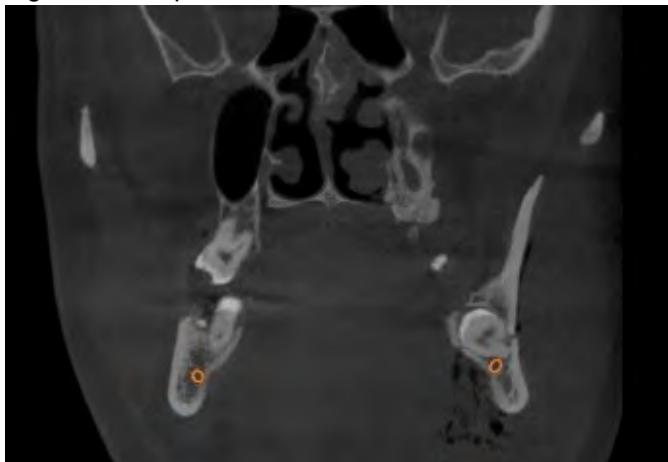


Figure 2: CBCT coronal section view



Figure 3: Intermaxillary fixation was achieved with arch bars and elastics in appropriate occlusion.



Figure 4: Parasympysis fracture was fixed with two miniplates.



Figure 5: Signs of cellulitis were detected in the patient's left submandibular region.



Figure 6: The fracture in the angle of mandible region was reduced openly from the external oblique ridge and internal fixation was performed with a single mini plate.

TAM METİN SÖZLÜ BİLDİRİLER

SS-004

230 HASTADA İMPLANT UYGULAMALARININ RETROSPEKTİF DEĞERLENDİRİLMESİ

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Amaç: Bu çalışmanın amacı, Ankara Yıldırım Beyazıt Üniversitesi Ağız, Diş ve Çene Cerrahisi Kliniği'nde implant tedavisi uygulanan hastalarda demografik özellikler, sistemik ve lokal risk faktörleri, greftleme yöntemleri ve implant başarısını retrospektif olarak değerlendirmektir.

Materyal-metot: 2024–2025 yılları arasında implant tedavisi yapılan 230 hasta retrospektif olarak incelendi. Yaş, cinsiyet, sistemik hastalık ve ilaç kullanımı, sigara, bruksizm, vitamin takviyesi, önceki implant deneyimi, immediat implant uygulamaları, greftleme yöntemleri ve kullanılan materyaller değerlendirildi. İmplant başarısızlıklarını tanımlayıcı istatistiklerle analiz edildi.

Bulgular: Hastaların yüzde 54,3'ü erkek iken yüzde 45,7'si kadındı. Hastaların yaş ortalaması 47,28di. Sigara kullanımı %27,39, bruksizm sıklığı ise %24,78 olarak belirlendi. Hastaların %67,91'i düzenli ilaç kullanıyor olup, en sık görülen sistemik durum hipertansiyondu; antihipertansif ilaç kullanımı %18,26 oranındaydı. Vitamin takviyesi kullanım oranı %30,86 iken, en yaygın kullanılan destek D vitaminiydi (%20). Hastaların

%10'u daha önce implant deneyimine sahipti. İmmmediat implant uygulama oranı %7,82 olarak saptandı. Graftleme işlemleri incelendiğinde, hastaların %28,69'unda sinüs lift yapılmış olup, bunların %15,65'i kapalı lift şeklindeydi. Sinüs lift dışı graftlemeler %22,17 oranında gerçekleştirildi ve en sık tercih edilen yöntem %7,82 ile Urban tekniği oldu. Genel olarak hastaların %50,86'sında graft kullanıldı; en çok tercih edilen graft materyali ise

%36,95 ile ksenograftti. Tüm implantlar değerlendirildiğinde yalnızca 3 olguda

başarısızlık gözlendi. Bu olgulardan ikisi greftleme yapılan, biri ise immediat implant uygulanan hastalardı.

Sonuç: Bu retrospektif değerlendirme, implant başarısında hasta alışkanlıkları, sistemik durum, ilaç kullanımı ve greftleme yöntemlerinin belirleyici olduğunu göstermektedir. Bulgular, implant tedavilerinde risk faktörlerinin yönetimi ve cerrahi yaklaşım seçiminde klinisyenlere yol gösterici olacaktır.

Anahtar Kelimeler: dental implantlar, risk faktörleri, retrospektif çalışma

EVALUATION OF 230 PATIENTS UNDERGOING IMPLANT TREATMENT: A RETROSPECTIVE STUDY

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Introduction: The aim of this study was to retrospectively evaluate the demographic characteristics, systemic and local risk factors, grafting procedures, and implant success in patients who underwent implant treatment at the Oral and Maxillofacial Surgery Clinic of Ankara Yıldırım Beyazıt University.

Materials and Methods: A total of 230 patients who received implant treatment between 2024 and 2025 were retrospectively analyzed. Data on age, sex, systemic diseases and medication use, smoking, bruxism, vitamin supplementation, previous implant experience, immediate implant placement, grafting techniques, and graft materials were recorded. Implant failures were assessed using descriptive statistics.

Results: Patients of 54.3% males and 45.7% females, with a mean age of 47.28 years. Smoking was reported in 27.39%, bruxism in 24.78%. Regular medication use was

present in 67.91%, with hypertension being most common systemic condition; 18.26% of patients used antihypertensive drugs. Vitamin supplementation was reported in 30.86%, most frequently vitamin D (20%). Ten percent of the patients had a previous history of implant treatment. The rate of immediate implant placement was 7.82%. Grafting procedures were performed in 28.69% of cases as sinus lift, of which 15.65% were closed techniques. Non-sinus lift grafting accounted for 22.17%, with Urban technique being most frequent (7.82%). Overall, grafting was required in 36.95% of patients, with xenograft being most used material (50.86%). Only three implants failed during follow-up; two were associated with grafting procedures, one with immediate placement.

Conclusion: This retrospective evaluation highlights significance of patient habits, systemic conditions, medication use grafting approaches determining implant success. The findings provide valuable insights for clinicians in risk management, surgical decision-making in implant dentistry.

Key Words: dental implants, risk factors, retrospective study

GİRİŞ

Dental implantlar, diş kaybının fonksiyonel ve estetik rehabilitasyonunda yüksek başarı oranlarıyla yaygın olarak kullanılan güvenilir tedavi seçeneklerindendir (1). İmplant tedavisinin başarısı; hastanın sistemik durumu, kullanılan ilaçlar, oral alışkanlıklar ve uygulanan cerrahi teknik gibi çok sayıda faktörden etkileñebilmektedir. Diyabet, hipertansiyon ve osteoporoz gibi sistemik hastalıkların yanı sıra bu hastalıklara yönelik ilaç tedavilerinin kemik metabolizması, yara iyileşmesi ve osseointegrasyon süreçleri üzerinde etkili olabileceği çeşitli çalışmalarla bildirilmiştir (2,3,4).

Sistemik faktörlerin yanı sıra lokal klinik parametreler de implant прогнозunda önemli rol oynamaktadır. Kemik kalitesi, greftleme gereksinimi, cerrahi teknik ve yükleme zamanı gibi değişkenlerin implant sağkalımıyla ilişkili olduğu bilinmektedir. Bunun yanında vitamin desteği kullanımı, sigara ve braksızım gibi alışkanlıkların da implant прогнозu üzerinde etkili olabileceği farklı çalışmalarla ortaya konmuştur (5-6). Sigaranın peri- implant dokular üzerinde olumsuz etki gösterdiği ve erken dönemde kemik kaybı riskini

artırıldığı bildirilirken (7), braksızmin aşırı okluzal yük nedeniyle mekanik stres oluşturarak komplikasyon riskini artırabileceği belirtilmektedir (8). Vitamin düzeyleri ile implant başarısı arasındaki ilişki tam olarak netleşmemekle birlikte, özellikle D vitamini eksikliğinin kemik metabolizması ve osseointegrasyon sürecini olumsuz etkileyebileceğine dair veriler mevcuttur (9).

Mevcut literatür incelemişinde hem sistemik hem lokal faktörlerin implant başarısı üzerindeki etkilerine ilişkin bulguların oldukça değişken olduğu, bu nedenle konuya dair net bir görüş birliğinin bulunmadığı görülmektedir. Bu durum, implant tedavisinde rol oynayan çok yönlü risk faktörlerinin daha geniş örneklemlerle değerlendirilmesi gerekliliğini ortaya koymaktadır. Retrospektif klinik çalışmalar, gerçek hasta verilerine dayanması nedeniyle implant başarısını etkileyen faktörlerin daha kapsamlı şekilde anlaşılmamasına katkı sağlamaktadır. Literatürdeki retrospektif çalışmaların büyük kısmında değerlendirilen parametreler oldukça sınırlıdır. Bu çalışmada implant başarısını etkileyebilecek çok sayıda değişken birlikte değerlendirilerek literatüre daha bütüncül bir bakış açısı sunulmuştur.

Çalışmanın H0 hipotezi, sistemik risk faktörlerinin, greftleme yöntemleri ve kullanılan greft materyalinin implant başarısı üzerinde doğrudan etkisi olmadığı; H1 hipotezi ise bu değişkenlerin implant başarısını etkileyebileceği şeklinde oluşturulmuştur.

Bu çalışmanın amacı, implant tedavisi uygulanan hastalarda demografik özellikler, sistemik ve lokal risk faktörleri, greftleme yöntemleri ve implant başarısını retrospektif olarak değerlendirmektir.

Materyal-Metod:

Bu retrospektif çalışma, Ankara Yıldırım Beyazıt Üniversitesi Diş Hekimliği Fakültesi Ağız, Diş ve Çene Cerrahisi Kliniği'nde Ocak 2024–Temmuz 2025 tarihleri arasında implant tedavisi uygulanan toplam 230 hastanın kayıtları incelenerek gerçekleştirildi.

Çalışma için etik kurul onayı alındı. Dahil edilme kriteri olarak implantın ideal cerrahi koşullarda, bukkal ve lingualde en az 1 mm kemik kalınlığı sağlanarak yerleştirilmiş olması kabul edildi. Takip verileri eksik olan hastalar değerlendirmeye alınmadı.

Değerlendirilen parametreler arasında hastaların yaş ve cinsiyeti, sistemik hastalık varlığı, düzenli ilaç kullanımı, sigara ve bruksizm alışkanlığı, vitamin takviyesi kullanımı, önceki implant deneyimi, immediat implant uygulaması, greftleme gereksinimi, uygulanan greftleme yöntemleri ve kullanılan greft materyalleri yer aldı.

Implant başarı ve başarısızlık değerlendirmesi ITI ve Albrektsson kriterleri (10,11) temel alınarak yapıldı. Buna göre implantın başarılı kabul edilmesi için klinik mobilitenin bulunmaması, ağrı, enfeksiyon veya püy akışının olmaması, radyografik incelemede klinik olarak anlamlı marginal kemik kaybının görülmemesi ve implantın fonksiyonel yük taşıyabilir durumda olması gerekmektedir. Implant başarısızlığı ise implantta mobilite saptanması, persistan ağrı veya enfeksiyon varlığı, püy akışı, radyografik olarak belirgin kemik kaybı izlenmesi ya da implantın fonksiyonel olarak yüklenememesi veya kaybedilmesi durumu olarak tanımlandı. Veriler tanımlayıcı istatistiklerle analiz edildi ve İstatistiksel anlamlılık düzeyi $p<0.05$ olarak kabul edildi.

BULGULAR

Çalışmada toplam 230 hastaya 798 implant uygulandı. Hastaların %54,3'ü erkek, %45,7'si kadındı ve ortalama yaş 47,28 olarak hesaplandı (Tablo 1). Sigara kullanımı %27,39 ($n=63$), bruksizm ise %24,78 ($n=57$) oranında görüldü (Tablo 2). Hastaların %63,91'i ($n=147$) düzenli ilaç kullanmaktadır. Sistemik hastalıklar arasında en sık hipertansiyon (%18,26; $n=42$), ikinci sıklıkta ise diyabet (%7,82; $n=18$) yer aldı (Tablo 3). Hastaların %30,86'sı ($n=71$) düzenli olarak vitamin desteği kullanmakta olup, en sık kullanılan takviye D vitamini (%20), ardından B12 vitamini (%15,65; $n=36$) gelmekteydi (Tablo 4). Ayrıca hastaların %10'u ($n=23$) daha önce implant deneyimine sahipti ve immediat implant uygulama oranı %7,82 ($n=18$) olarak belirlendi.

Greftleme işlemleri değerlendirildiğinde hastaların %50,86'sına (n=117) herhangi bir greftleme yöntemi uygulandığı görüldü. Bu işlemler içerisinde en sık uygulanan yöntem sinüs lift olup toplam %28,69 (n=66) oranındaydı. Sinüs lift uygulamalarının %15,65'i kapalı (n=36), %13,04'ü ise açık lift (n=30) şeklinde gerçekleştirildi. Sinüs lift dışındaki diğer greftleme yöntemleri %22,17 (n=51) oranında uygulandı. Bu grupta en sık tercih edilen yöntem Urban tekniği (%7,82; n=18), ardından Khoury tekniği (%4,34; n=10) geldi (Tablo 5-6). Greft materyalleri incelendiğinde ksenogreft %17,82 orANIyla en sık kullanılan materyal olurken, otojen greft kullanım oranı %11,73 (n=27) olarak kaydedildi (Tablo 7).

Takip süresi sonunda yalnızca üç hastada (üç implantta) başarısızlık görüldü. Buna göre hasta bazlı başarı oranı %98,70; implant bazlı başarı oranı ise %99,63 olarak hesaplandı (Tablo 8). Başarısız olan implantların ikisi augmentasyon uygulamış bölgelerde yer almaktak olup birinde Khoury tekniği, diğerinde kret split yönteminin kullanıldığı tespit edildi. Üçüncü başarısızlık ise immediat implant uygulanan bir hastada meydana geldi. Augmentasyon yapılan hastalarda başarı oranı %96,08 iken, augmentasyon yapılmayan hastalarda başarı oranı %99,1 olarak bulundu (Tablo 9).

TARTIŞMA

Bu retrospektif çalışmada 230 hastaya yerleştirilen 798 implantın klinik sonuçları değerlendirilmiş ve takip süresi sonunda hasta bazlı başarı oranı %98,70, implant bazlı başarı oranı ise %99,63 olarak bulunmuştur. Bu yüksek başarı oranları, dental implantların günümüzde öngörlülebilir bir tedavi seçeneği olduğunu bildiren literatür ile uyumludur. Çalışmada dikkat çeken bulgulardan biri, başarısızlıkların yalnızca augmentasyon yapılan bölgelerde ve bir immediat implant uygulamasında görülmESİdir. Özellikle Khoury tekniği ve kret split uygulanan iki olguda implant kaybı gözlenmesi, ileri cerrahi gerektiren vakalarda biyomekanik ve biyolojik faktörlerin daha kritik olabileceğini düşündürmektedir. İmmmediat implant uygulanan bir hastada erken başarısızlık görülmESİ ise uygun vaka seçiminin bu protokolde belirleyici olduğunu bir kez daha vurgulamaktadır.

Greftleme yapılan vakalarda gözlenen bu başarısızlıklar, greftleme yapılmayan olgularla karşılaşıldığında klinik olarak anlamlı bir fark oluşturacak düzeyde değildir; bununla birlikte augmentasyon gerektiren bölgelerin doğası gereği daha kompleks olduğu göz önünde bulundurulmalıdır. Literatürde de greftleme sonrası implant sağkalımıyla ilgili sonuçların heterojen olduğu bildirilmektedir. Chatzopoulos ve Wolff'un (2023) çalışmasında sinüs augmentasyonu ve eş zamanlı kemik artırımı yapılan bölgelerde implant kaybının nispeten daha yüksek olabileceği belirtilmiştir. (12) Buna karşın Ramanauskaite et al. (2019) ve Li ve ark. (2025) gibi sistematik derlemelerde greftleme yapılan ve yapılmayan bölgeler arasında anlamlı bir başarı farkı olmadığı görülmüştür. (13,14) Bu çalışmada da augmentasyonun implant başarısı üzerinde belirleyici bir etkisi bulunamamıştır; ancak örneklem dağılımı ve başarısızlık sayısının düşük olması nedeniyle bu bulgunun yorumlanmasında temkinli olunmalıdır.

Sistemik faktörler değerlendirildiğinde diyabetin implant başarısı üzerindeki etkisi uzun yıllardır tartışılmaktadır. Hipergliseminin vasküler veimmün mekanizmalar üzerindeki olumsuz etkileri risk oluştursa da iyi kontrol altındaki diyabetli hastalarda implant sağkalım oranlarının genel popülasyona yakın olduğu meta-analizlerle gösterilmiştir. Bu çalışma da aynı şekilde, kontrol altındaki diyabetin implant başarısı üzerinde belirgin bir olumsuz etkisi olmadığını ortaya koymuştur. (15)

Benzer şekilde, osteoporoz ve yaygın kullanılan ilaçların etkilerine ilişkin bulgular heterojendir. Aghaloo ve arkadaşlarının (2019) derlemesinde osteoporozun implant sağkalımını anlamlı düzeyde etkilemediği, SSRI ve PPI gibi ilaçların ise bazı çalışmalarda implant kaybıyla ilişkilendirildiği bildirilmektedir. (16) Çalışmada osteoporozun implant başarısına olumsuz bir etkisi gözlenmemiştir. SSRI ve PPI kullanan sınırlı sayıdaki hastada implant kaybı izlenmemiştir; ancak bu alt gruplardaki örneklem sayısı oldukça düşük olduğundan bu sonuçlar genellenebilir nitelikte değildir.

Sigara kullanımı literatürde en güçlü risk faktörlerinden biri olarak tanımlanmakla birlikte, çalışmamızda sigara içen hastalarda implant kaybı gözlenmemiştir. Bununla birlikte örneklem sayısının sınırlı oluşu ve sadece üç implant başarısızlığı bulunması nedeniyle bu sonuç dikkatle değerlendirilmelidir. (17) Bruksizmin aşırı okluzal yük oluşturarak mekanik

stres artırdığı ve komplikasyon riskini yükseltebileceği ifade edilse de çalışmada bruksizmin implant başarısı üzerinde belirgin bir etkisi görülmemiştir. Bu bulgu, implant tasarımlarındaki gelişmeler, okluzal düzenlemeler veya bruksizmin subjektif olarak değerlendirilmesi gibi faktörlerle ilişkili olabilir. (18)

Vitamin düzeyleri ile implant başarısı arasındaki ilişki literatürde net olmamakla birlikte D vitamini eksikliğinin osseointegrasyon sürecini etkileyebileceği öne sürülmektedir. Çalışmada en sık kullanılan vitamin desteği D vitamini olmasına rağmen implant kaybıyla ilişkili bir bulgu saptanmamıştır. Bununla birlikte hastaların gerçek serum D vitamini düzeyleri bilinmediği için bu sonucun sınırlı olduğu göz önünde bulundurulmalıdır. (19)

Bu çalışma, implant başarısını etkileyebilecek çok sayıda sistemik, lokal ve cerrahi değişkeni aynı anda değerlendirmesi açısından literatürdeki birçok retrospektif çalışmadan daha kapsamlı bir yaklaşım sunmaktadır. Bulgular, iyi kontrol edilen sistemik hastalıkların, sigara, bruksizm ve ilaç kullanımının implant başarısını tek başına belirleyici olmadığını göstermektedir. Bununla birlikte düşük başarısızlık oranı ve bazı alt gruplarda sınırlı örneklem olması, bulguların dikkatli yorumlanması gerekmektedir. Gelecekte daha geniş örneklemli, prospektif ve çok merkezli çalışmalarla implant başarısını etkileyen faktörlerin daha net şekilde ortaya konulması önem taşımaktadır.

SONUÇ

Bu çalışmanın bulguları, uygun cerrahi planlama, dikkatli vaka seçimi ve doğru endikasyonla gerçekleştirilen implant uygulamalarının, sistemik hastalığı veya düzenli ilaç kullanımı bulunan bireylerde dahi yüksek başarı oranlarıyla yapılabileceğini göstermektedir. Literatürde bazı çalışmalarla uyumlu olmakla birlikte bazlarıyla farklılık gösteren sonuçlar, implant başarısının çok faktörlü bir olgu olduğunu ve hasta özelliklerinin tek başına belirleyici olmadığını ortaya koymaktadır. Sistemik durum ve ilaç kullanımı gibi değişkenlerin uygun kontrol altında tutulması durumunda implant sağkalımını anlamlı düzeyde etkilemediği görülmüştür.

Sonuç olarak, implant tedavilerinde bireysel risk faktörlerinin kapsamlı bir şekilde değerlendirilmesi, cerrahi teknik seçiminde dikkatli olunması ve postoperatif takibin titizlikle sürdürülmesi yüksek başarı oranlarının elde edilmesinde temel unsurlardır. Bu bulguların daha geniş örneklemlü, prospektif çalışmalarla desteklenmesi, implant başarısını etkileyen faktörlerin daha net bir şekilde ortaya konmasına katkı sağlayacaktır.

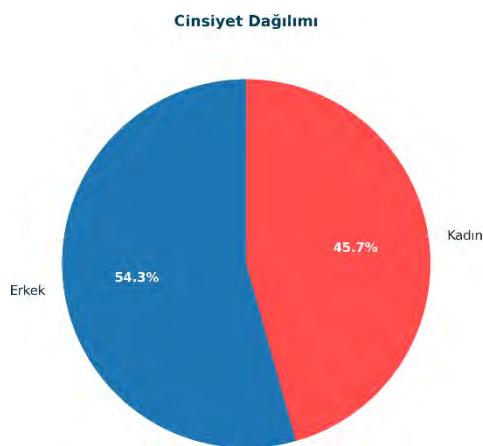
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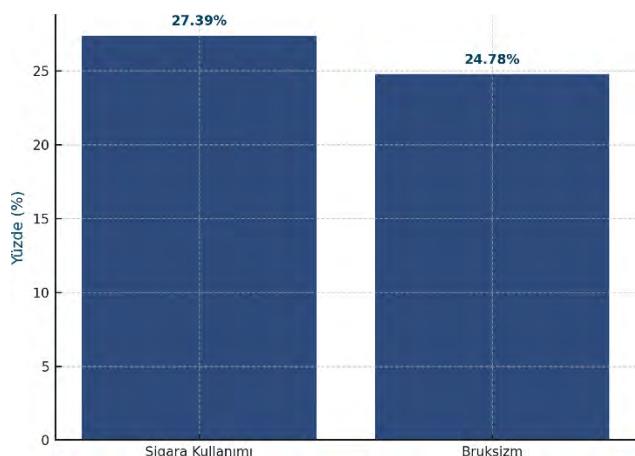
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Tablolar



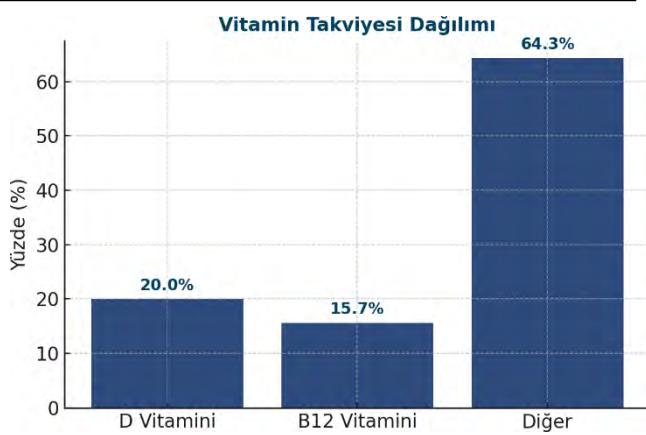
Tablo:1 Kadın erkek cinsiyet dağılımı



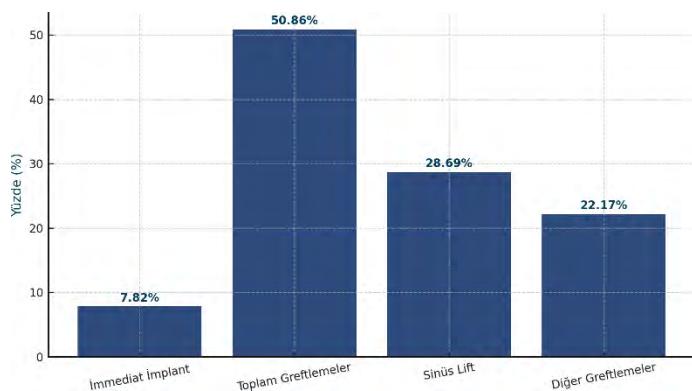
Tablo:2 Sigara kullanımı ve bruksizm yüzdeleri



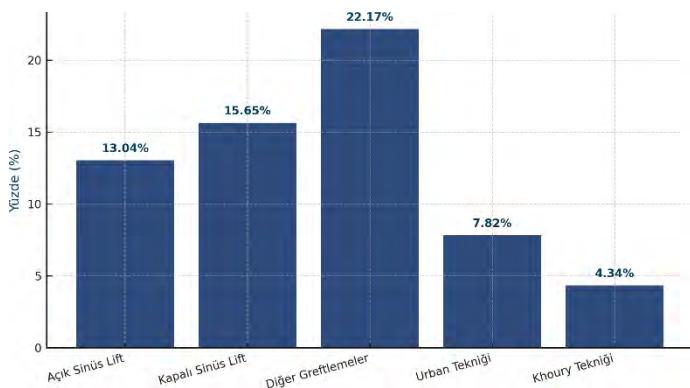
Tablo:3 Sistemik hastalık dağılım tablosu



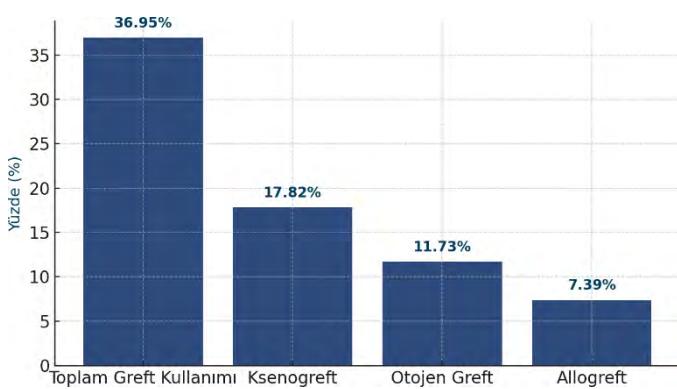
Tablo:4 Vitamin takviyesi dağılımı



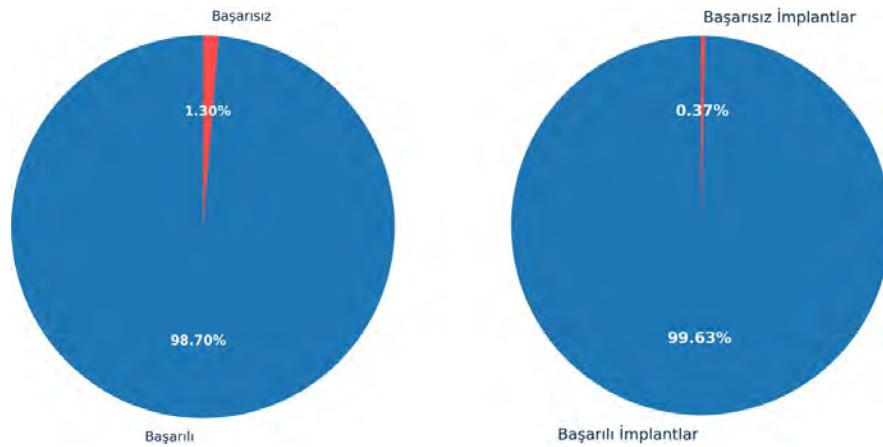
Tablo:5 Graftleme Dağılım Tablosu



Tablo:6 Graftleme Yöntemi Dağılım Tablosu



Tablo:7 Graftlemede kullanılan materyallerin dağılım
yüzdeleri



Tablo:8 İmplant başarısının genel değerlendirmede yüzdelik



Tablo:9 İmplant başarısının augmentasyon yapılan bölgelerdeki başarı

SS-008

RETROSPECTIVE EVALUATION OF MANDIBULAR FRACTURES IN PEDIATRIC PATIENTS

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ABSTRACT

Objective: To evaluate the anatomical distribution, etiological factors, treatment methods, and long-term outcomes of pediatric mandibular fractures treated at Çukurova University between 2012 and 2023.

Materials and Methods: This retrospective study included 50 patients under the age of 18 who were treated for mandibular fractures between 2012 and 2023. Demographic characteristics, fracture localization, etiological factors, treatment modalities, and plate removal rates were analyzed. In the 42 patients who attended follow-up, complications, functional findings, and radiological assessments were evaluated.

Results: The mean patient age was 12.5 ± 4.7 years; 35 were male and 15 female. Falls (38%) and motor vehicle accidents accounted for 74% of etiologies. Among 81 fractures, 37% were condylar, 24.7% parasymphyseal, 18.5% angle, 11.1% symphyseal, and 8.6% corpus. Treatments included ORIF (52%), MMF (32%), conservative (8%), and ORIF+MMF (8%). Plate removal was more frequent in children <12 years, though 76% retained plates. Follow-up was available for 42 patients (mean 3.9 years). No complications occurred in 76.2%. The most common complications were mandibular asymmetry (11.9%), deviation in mouth opening (9.5%), and lower lip paresthesia (2.4%). Patient age was significantly associated with fracture etiology, and condylar fracture location with displacement. Medially displaced/deviated condyles remodeled over time, restoring symmetry. Clinical findings showed normal interincisal opening and lateral movements after treatment.

Conclusion: In pediatric patients, the least invasive and most functional treatment options that do not compromise growth should be prioritized. In asymptomatic cases, leaving non-resorbable plates in situ appears safe; however, due to potential growth-related effects in younger patients, close follow-up and removal when necessary are recommended.

Keywords: Pediatric, mandibular fracture, retrospective.

1. Introduction

The elastic structure of bones in children, their high cartilage content, and the protection of the zygomatic region by the buccal fat pad make the facial skeleton more resistant to trauma compared to adults^{1,2}. In pediatric patients, the majority of maxillofacial injuries remain confined to soft tissues, while among skeletal fractures, the mandible is the most frequently affected bone³. The primary etiological factors for pediatric mandibular fractures include falls, traffic accidents, sports injuries, interpersonal violence, and child abuse^{1,4–7}. The anatomical distribution of mandibular fractures also varies with age. The condyle is the most commonly affected site in the pediatric population and occurs more frequently compared to adults^{1,4,8}. Furthermore, symphyseal and parasymphyseal fractures are more common in children, whereas corpus and angle fractures are less prevalent compared to adults⁹. Ramus fractures are rare, and coronoid fractures have been reported only exceptionally⁹. Treatment options for mandibular fractures include conservative management, closed reduction, open reduction and internal fixation (ORIF), and combined approaches (ORIF + MMF). In the primary and mixed dentition periods, closed treatment modalities may involve labial, lingual, or occlusal splints used in combination with circummandibular wiring, as well as bracket-elastic ligature systems. In the permanent dentition period, intermaxillary fixation (IMF) screws, arch bars, or the Ivy loop technique can be applied. ORIF is preferred in cases with appropriate indications, whereas conservative approaches are prioritized particularly in younger children. Functional therapy is recommended in condylar fractures with deviation or mild displacement, especially in children aged 6–12 years with high growth potential¹⁰. During this period, the remarkable adaptive capacity of the condyle is utilized; functional appliances support mandibular growth, preserve joint function, and contribute to the remodeling process. Occlusal splints used in functional therapy protect the articular disc from secondary injuries and promote reshaping through biomechanical stimulation¹¹.

Currently, there is no universally accepted gold standard for the management of pediatric mandibular fractures. Treatment should be individualized according to the patient's age, fracture location, degree of displacement, and dentition stage. Moreover, long-term clinical and radiographic follow-up is essential to evaluate the potential

effects on growth and development. The World Health Organization and several international authorities define individuals under the age of 18 as pediatric patients. Accordingly, the majority of studies in the current literature investigating pediatric mandibular fractures have included individuals under 18 years of age^{1,12-14}. Therefore, in the present study, pediatric mandibular fractures were evaluated in patients younger than 18 years.

2. Materials and Methods

This retrospective observational study was conducted with the approval of the Non-Interventional Clinical Research Ethics Committee of Çukurova University Faculty of Medicine, dated December 8, 2023 (decision no: 2023/24). The study included otherwise healthy patients under the age of 18 who were admitted to Çukurova University Faculty of Dentistry between 2012 and 2023 and diagnosed with mandibular fractures following trauma. Patients with isolated alveolar fractures, maxillofacial fractures outside the mandible, a history of surgery at another center, systemic bone diseases, or those unable to cooperate during follow-up examinations were excluded from the study.

Demographic data (age, sex), trauma and fracture related characteristics [etiology of trauma, anatomical location of the fracture (according to the classification of Dingman and Natvig), localization and displacement status of condylar fractures (based on the classifications of Loukota et al., 2005 and MacLennan)], treatment modalities applied (conservative, closed, open, or combined approaches), fixation materials used, and follow-up duration were recorded. Clinical follow-up included assessment of maximum interincisal opening (MIO), mandibular lateral movements, occlusion status, and late complications (mandibular asymmetry, deviation, ankylosis, infection, etc.). Data were obtained from patient records, radiological imaging, and clinical examinations of patients who were recalled for follow-up.

The collected data were analyzed using descriptive statistical methods. Associations between categorical variables were evaluated with Chi-square and Fisher's exact tests, while comparisons between two independent groups were performed using the Mann-Whitney U test. A p-value <0.05 was considered statistically significant.

3. Result

The mean age of the 50 patients included in the study was 12.5 ± 4.7 years (range: 2-17 years), with 70% being male and 30% female. The mean age of male patients (13.7 years) was significantly higher than that of female patients (9.8 years) ($p = 0.006$). The most common causes of trauma were falls and motor vehicle accidents. Less frequently, assaults, sports-related injuries, and bicycle accidents were observed; elevator accidents and earthquake-related injuries were reported only rarely (Table 1). When trauma etiology was analyzed by sex, the most frequent cause of fractures in girls was falls from height (66.7%), whereas in boys motor vehicle accidents were predominant (45.7%). This difference between sexes was statistically significant. A total of 81 fracture sites were identified; the most frequently affected region was the condyle, followed by the parasymphysis, angle, symphysis, and corpus (Table 2). Most cases presented with combined fracture patterns, with condyle + parasymphysis, angle + parasymphysis, and condyle + symphysis combinations being the most common.

When the fracture pattern stratified by age group, isolated parasymphysis and symphysis fractures were observed only in the ≤ 12 -year group, whereas angle fractures were more common in the > 12 -year group (Table 3). Isolated condylar fractures were detected at similar rates in both age groups, and this distribution was statistically significant ($p = 0.039$).

Regarding treatment methods, ORIF was the most frequently performed approach (26 patients), followed by closed treatment in 16 patients, conservative treatment in 4 patients, and combined treatment in 4 patients (Table 4). Approximately half of the ORIF cases were treated with titanium plates. In closed treatment, the most common method was fixation with arch bars; other methods included imf screws, acrylic splint-circummandibular wiring, and button appliances. By age group, ORIF was more frequently performed in the > 12 -year group ($n = 17$). Although closed treatment was applied at similar rates in both age groups, it was relatively more common in the ≤ 12 -year group. Arch bars were used in 6 patients in the > 12 -year group; acrylic splint-circummandibular wiring was applied in 3 patients in the ≤ 12 -year group during the primary dentition period; and button appliances were used in 2 patients in the ≤ 12 -year group during the mixed dentition period. Plates were applied to 40 fractures in 30 patients, and subsequently removed in only 8 patients (10 fractures). The plate removal period ranged from 6 to 36 months, with a mean of 18.6 months. Although plate application rates were higher in the > 12 -year group, the difference was not statistically significant. In contrast, plate removal rates were significantly higher in the ≤ 12 -year group ($p < 0.05$) (Table 5).

Analysis of the anatomical distribution of condylar fractures revealed that condylar neck fractures were significantly more frequent in the ≤ 12 -year group, whereas subcondylar fractures were more common in the > 12 -year group ($p = 0.037$) (Table 6). In terms of displacement, displaced fractures were most commonly

observed in the condylar head, whereas non-displaced fractures predominated in the subcondylar region ($p = 0.004$ for both) (Table 6).

The mean follow-up period of the 42 patients monitored was 3.93 ± 3.22 years. No complications were observed in 76.2% of cases, while 10 patients developed complications. These included mandibular asymmetry and deviation/deflection during mouth opening; only one patient presented with lower lip paresthesia (Table 7). According to occlusion scoring, 26 patients had good, 11 had acceptable, and 5 had poor occlusion. When fracture combinations were compared with complications, mandibular asymmetry was most often observed in patients with condyle + parasymphysis, condyle + symphysis, and angle fractures; deviation was seen in condylar fractures; and lower lip paresthesia occurred in corpus fractures. However, no statistically significant differences were found in complication rates ($p = 0.395$) (Table 8).

Occlusion outcomes showed that good occlusion was more common in isolated fracture patterns, while combined fractures demonstrated more variable results. Nonetheless, no statistically significant relationship was found between fracture combinations and malocclusion ($p > 0.05$).

When condylar fractures were analyzed separately, 20 patients presented with unilateral fractures. Among these, 16 underwent closed treatment, 1 was managed with ORIF, and 4 were treated conservatively with a soft diet. All 5 patients with bilateral fractures were treated with closed methods. Clinical findings of the 21 condylar fracture patients who attended follow-up (Table 9) showed that in unilateral fractures, occlusion was mostly good or acceptable, with poor occlusion observed in only 1 case. In contrast, 50% of patients with bilateral fractures presented with poor occlusion. Deviation in maximum mouth opening was observed in only 4 patients with unilateral fractures. In both groups, MIO was generally ≥ 40 mm. Comparison of patients with and without condylar fractures demonstrated that both groups had functional ranges of MIO and lateral movements, with no statistically significant differences between measured values (Table 10). Regarding malocclusion scores, good occlusion was the most frequent outcome in both groups, and no significant association was found between the presence of condylar fractures and malocclusion.

4. Discussion

In the literature, the incidence of pediatric mandibular fractures has been reported to increase with age and to occur approximately twice as frequently in males compared to females.^{12,15-17} In our study, the mean age of the cases was 12.5 ± 4.7 years, with a male-to-female ratio of 70% to 30%, supporting the observation that mandibular fractures are more common in older pediatric patients and occur more frequently in males. Fracture pattern and etiology are influenced by both age and sex.¹⁵ When trauma etiology was evaluated by sex, low-energy domestic accidents (particularly falls from height) were the most frequent cause in female patients, whereas high-energy traumas (motor vehicle accidents and assaults) predominated in male patients. These findings suggest that sex may play a determinant role in the mechanism of trauma in pediatric mandibular fractures. Regarding age distribution, falls were the most common cause of fractures in the ≤ 12 -year age group, while motor vehicle accidents and assaults were more prominent in patients > 12 years. This difference can be attributed to factors such as age-related social behavior patterns, levels of physical activity, and environmental exposure.

According to the literature, the condyle is the most frequently affected site in pediatric mandibular fractures.^{18,19} Consistent with this, our study also found that the condyle was the most common fracture location. Symphyseal and particularly parasymphyseal fractures have been reported to occur more frequently in children than in adults, a finding attributed to the presence of canine tooth follicles along the lower border of the mandible during development, which creates a weak point predisposing to fracture.^{20,21} In line with these reports, parasymphyseal fractures were the second most common localization after condylar fractures in our cohort. The anatomical distribution of pediatric condylar fractures has also been shown to vary with age.^{1,22,23} Several studies have reported that condylar head fractures are most frequent in younger children (particularly under 7 years), whereas in older children fractures tend to shift toward the condylar neck and subcondylar regions.^{19,24,25} In our series, condylar neck fractures were more common in children ≤ 12 years, whereas subcondylar fractures predominated in those > 12 years. Interestingly, condylar head fractures were observed at a higher rate in children > 12 years compared to younger patients. These statistically significant differences contradict the trends reported in the literature, which may be explained by factors such as sample size and variations in the definition of age groups. Our findings indicate that the localization of mandibular condylar fractures in children may change with age and that this variation is closely related to skeletal maturation.

Previous studies have noted that condylar head fractures exhibit higher displacement rates, whereas subcondylar fractures are more stable.^{25,26} In our study, displacement was observed in 90% of condylar head fractures, a rate significantly higher than in other anatomical sites. This supports the notion that condylar head fractures, due to their intra-articular location, are more susceptible to trauma and therefore tend to present with

greater displacement. Conversely, 40% of subcondylar fractures in our series were nondisplaced, a significantly higher proportion compared to other fracture sites, suggesting that the surrounding soft tissue support may help stabilize fractures in this region.

Similarly, the scope of this study was limited to fractures of the mandibular skeletal framework; alveolar process fractures were excluded, as they typically require dental-focused treatment approaches such as splinting or occlusal rehabilitation and are not routinely managed within our oral and maxillofacial surgery department.

Treatment strategies for pediatric mandibular fractures vary according to fracture localization, displacement, and patient age. The literature emphasizes closed methods and occlusal splints in symphyseal, parasymphyseal, and body fractures,²³ while functional therapy is generally favored for condylar fractures. Although the effect of titanium plates on growth remains controversial, no consensus exists regarding their routine removal. Some authors advocate for prophylactic removal, whereas others recommend intervention only in the presence of complications.^{14,27-30} A multicenter retrospective analysis evaluating protocols from 14 maxillofacial surgery units worldwide reported that plate removal rates in asymptomatic pediatric patients were lower than those described in the literature, indicating that plate removal is not adopted as a routine practice in this population.³⁰

Furthermore, the frequency of plate removal decreased markedly with increasing age. We suggest that plates can be safely left in place in asymptomatic patients; however, closer follow-up is advisable in younger children.

A recent multicenter retrospective study reported that pediatric condylar fractures were managed by conservative, closed, or open methods across 14 maxillofacial surgery centers worldwide, but functional protocols were not implemented.³¹ Treatment choices were not standardized and largely depended on the surgeon's individual experience and expertise, with some European centers favoring surgical approaches.

Vesnaver et al.³² reported that none of the seven pediatric patients with displaced condylar fractures treated surgically developed facial asymmetry, growth disturbances, joint pain, or masticatory difficulties during long-term follow-up. These findings suggest that surgical management of displaced condylar fractures may preserve functional and esthetic outcomes without adversely affecting mandibular growth. By contrast, in our series, only one patient (aged 17 years) underwent open surgery, while all other condylar fractures were treated conservatively or with closed methods, reflecting our institution's preference for minimally invasive and conservative approaches.

In the literature, functional approaches such as early mobilization and the use of guiding elastics in displaced condylar fractures have been shown to promote condylar remodeling, enhance occlusal stability, and facilitate disc repositioning. The literature emphasizes that functional treatment protocols for displaced condylar fractures promote condylar remodeling and enhance growth potential^{24,33, 34, 11}. In our long-term follow-up cohort (2–11 years), panoramic imaging of patients with initially displaced or deviated condylar fractures showed remodeling of the affected condylar segments, which became nearly symmetrical with the contralateral side (Figures 1–3). Among unilateral condylar fracture cases, 94.1% achieved good or acceptable occlusion, whereas 50% of bilateral fractures resulted in poor occlusion. These findings suggest that bilateral condylar fractures may have more adverse effects on occlusion; however, the small sample size (n=4) limits statistical power. Most cases with mandibular asymmetry also presented with combined condylar and parasymphyseal fractures, a pattern that may contribute to asymmetry development. Nonetheless, it should be noted that mandibular asymmetry in our study was evaluated solely on dental references; therefore, potential skeletal-level asymmetries may not have been fully captured, limiting the accuracy of our results.

5. Conclusion and Recommendations

Our study demonstrates that the mechanisms of trauma in pediatric mandibular fractures vary according to age and sex, highlighting the need for age- and sex-specific preventive strategies. The condyle was identified as the most frequently affected anatomical site, with the majority of cases presenting with combined fractures. Most titanium plates were safely retained in asymptomatic patients, though careful follow-up is recommended for younger children. The main limitation of our study is the small sample size, so results should be interpreted cautiously.

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7. Tables

Table 1. Distribution of Patients According to Etiological Factors

Etiological Factors	Number of Patients (n, %)
Fall from height	19 (38)
Motor vehicle accident	18 (36)
Assault	5 (10)
Sports-related injury	4 (8)
Bicycle accident	2 (4)
Other causes	2 (4)
Total	50 (100)

Table 2. Distribution of Fracture Types According to Anatomical Regions

Fracture Type	Number of Fractures (n, %)
Condyle	30 (37)
Angle	15 (18.5)
Corpus	7 (8.6)
Parasymphysis	20 (24.7)
Sympysis	9 (11.1)
Total	81 (100)

Table 3. Distribution of Fracture Combinations According to Age Groups

Fracture Anatomical Location and Combinations	≤12 years (n, %)	>12 years (n, %)

Angulus	0 (0.0)	4 (14.3)
Angulus + Corpus	0 (0.0)	1 (3.6)
Angulus + Parasymphyseal	1 (4.5)	4 (14.3)
Angulus + Symphyseal	0 (0.0)	3 (10.7)
Corpus	2 (9.1)	2 (7.1)
Corpus + Parasymphyseal	1 (4.5)	0 (0.0)
Condyle	5 (22.7)	6 (21.4)
Condyle + Angulus	0 (0.0)	1 (3.6)
Condyle + Corpus	0 (0.0)	1 (3.6)
Condyle + Parasymphyseal	4 (18.2)	3 (10.7)
Condyle + Symphyseal	2 (9.1)	3 (10.7)
Parasymphyseal	5 (22.7)	0 (0.0)
Symphyseal	2 (9.1)	0 (0.0)

Table 4. Distribution of Treatment Approaches According to Subgroups

Treatment Method	Number of Patients (n, %)
Conservative treatment (soft diet)	4 (8)
ORIF (resorbable miniplate)	1 (2)
ORIF (titanium plate)	25 (50)
ORIF + MMF	4 (8)
MMF (arch bar)	8 (16)
MMF (IMF screw)	3 (6)
MMF (circummandibular wiring with acrylic splint)	3 (6)
MMF (with button appliances)	2 (4)
Total	50 (100)

Table 5. Comparison of the Number of Fractures Treated with Plates and Plate Removal Status According to Age Groups

Plate Application / Removal Status	≤12 years n=35 (number of fractures) (n, %)	>12 years n=46 (number of fractures) (n, %)	Total n=81 (number of fractures) (n, %)	p
Plate Applied	13 (37.1)	27 (58.7)	40 (49.4)	0.055
Plate Not Applied	22 (62.9)	19 (41.3)	41 (50.6)	
Plate Removed	8 (61.5)	2 (7.4)	10 (25)	0.001
Plate Not Removed	5 (38.5)	25 (92.6)	30 (75)	

Table 6. Distribution of Condylar Fracture Anatomical Locations According to Age Groups and Displacement Status

Anatomical Location of Condylar Fracture	Age Group		Displacement Status (n)
	≤12 years (n=14)	>12 years (n=16)	
Condylar Head (n=10)	4	6	Non-displaced: 0 Deviated: 1 Displaced: 9
Condylar Neck (n=10)	8	2	Non-displaced: 1 Deviated: 3 Displaced: 6
Subcondylar (n=10)	2	8	Non-displaced: 4 Deviated: 3 Displaced: 3
p	0.037		0.004

Table 7. Distribution of Complication Types

Type of Complication	Number of Patients (n, %)
No complication	32 (76.2)
Mandibular asymmetry	5 (11.9)
Lower lip paresthesia	1 (2.4)
Deviation/deflection on mouth opening	4 (9.5)
Total	42 (100)

Table 8. Complications According to Fracture Combinations

Fracture Combination	Complications		
	Mandibular Asymmetry (n)	Deviation / Deflection (n)	Lower Lip Paresthesia (n)
Angle (n=4)	1	0	0
Angle + Corpus (n=1)	0	0	0
Angle + Parasymphysis (n=3)	0	0	0
Angle + Symphysis (n=3)	0	0	0
Corpus (n=3)	0	0	1
Corpus + Parasymphysis (n=1)	0	0	0
Condyle (n=9)	0	4	0
Condyle + Angle (n=1)	0	0	0
Condyle + Corpus (n=1)	0	0	0
Condyle + Parasymphysis (n=6)	3	0	0
Condyle + Symphysis (n=4)	1	0	0
Parasymphysis (n=4)	0	0	0
Symphysis (n=2)	0	0	0

Table 9. Clinical Findings in Patients with Condylar Fractures According to Fracture Type (Patients Who Attended Follow-up)

Clinical Findings	Fracture Type of Condylar Fracture	
	Unilateral (n=17) n (%)	Bilateral (n=4) n (%)
Acceptable/Good Occlusion	16 (94.1)	2 (50)
Poor Occlusion	1 (5.9)	2 (50)
Deviation at Maximum Mouth Opening	4 (23.5)	0 (0)
MIO \geq 40 mm	16 (94.1)	4 (100)

Table 10. Maximum interincisal opening and lateral movements in patients with and without condylar fractures (Mean \pm SD)

	No Condylar Fracture (n=21) (Mean \pm SD)	Condylar Fracture (n=21) (Mean \pm SD)	p
MIO (mm)	47.00 \pm 7.42	46.33 \pm 4.89	0,733
Right Lateral Movement (mm)	8.81 \pm 1.75	7.71 \pm 2.87	0,143
Left Lateral Movement (mm)	7.95 \pm 1.80	7.95 \pm 2.25	1,000

7. Figures



Figure 1: OPG image of the patient who was 9 years old at the time of the trauma. A displaced fracture is observed at the head of the right condyle. The patient underwent closed treatment with buttons and elastics. (b) OPG image taken at the 3-year follow-up after the trauma. Significant improvement in the anatomical contours of the right condyle and a symmetrical growth pattern are observed. No significant asymmetry or developmental delay is observed between the condyles.

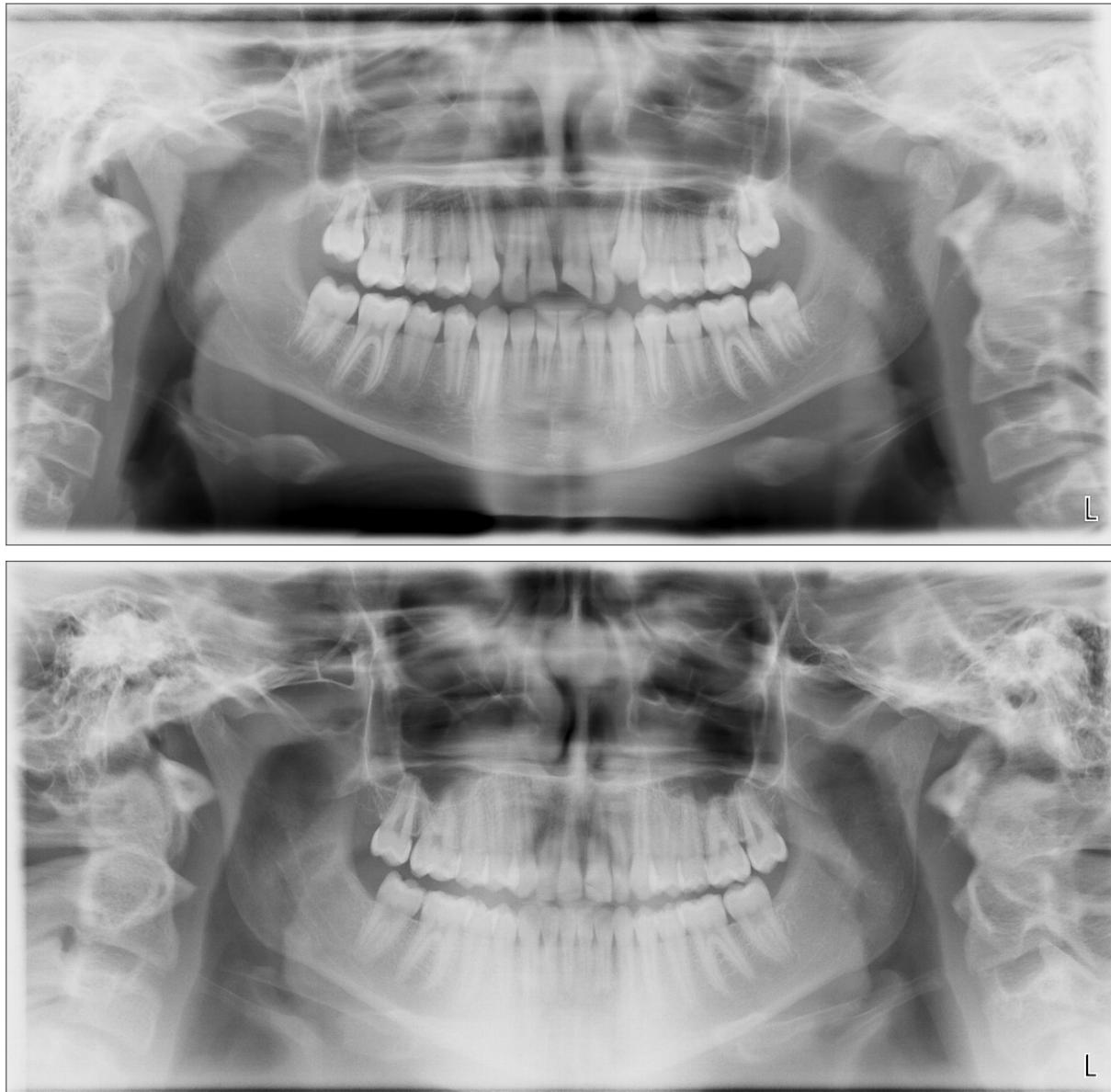


Figure 2: OPG image of the patient, who was 9 years old at the time of the trauma. A displaced fracture is observed at the head of the left condyle. The patient underwent closed treatment with buttons and elastic bands. (b) OPG image taken at the 2-year follow-up after the trauma. It is noteworthy that the left condyle, which was affected by the trauma, shows more pronounced development compared to the right condyle.

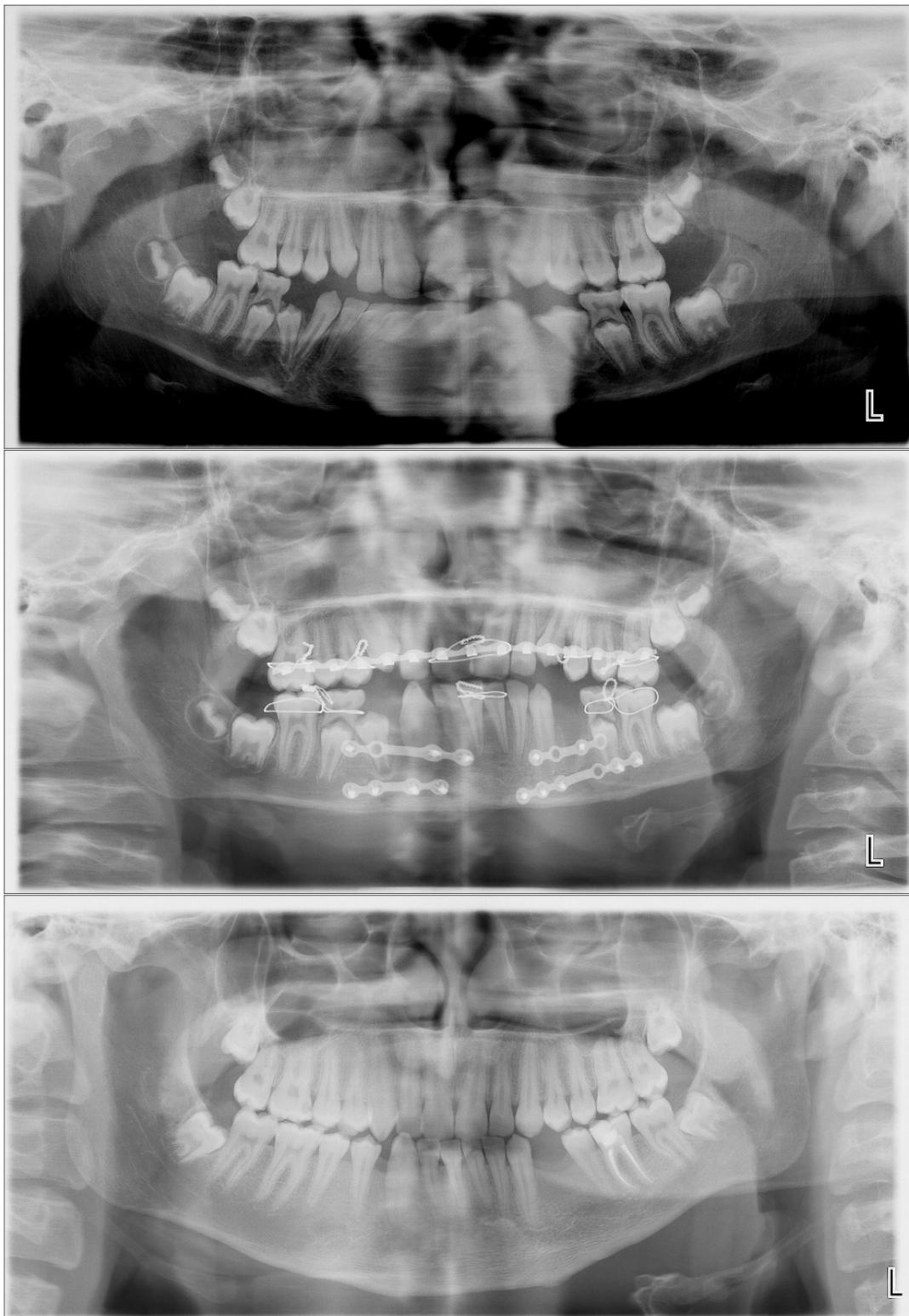


Figure 3: OPG image of the patient who was 12 years old at the time of the trauma. A displaced fracture of the right condyle neck and bilateral parasymphyseal fractures are observed. The condyle fracture was treated with closed reduction using an arch bar, Ernst ligature wires, and elastic bands; the parasymphyseal fractures were treated with open reduction and internal fixation using non-resorbable plates. (b) Control OPG image 5 years after the trauma. The right condyle is seen to have developed symmetrically and close to the other condyle. The applied plates were surgically removed 6 months after treatment.

SS-010

DERİN ÖĞRENME TABANLI İNFERİOR ALVEOLER SİNİR PARESTEZİSİ RİSKİ: CBCT REFERANSLI KLİNİK ÇALIŞMA

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Özet

Amaç : Panoramik radyografilerden mandibular üçüncü molar cerrahisi sonrası parestesi riskini üç düzeyde tabakalandıran, CBCT referanslı derin öğrenme modeli geliştirmek ve klinik sonuçlarla ilişkilendirmektir.

Gereç ve Yöntem : 2025 yılında Batman Üniversitesi'nde yürütülen tek merkezli gözlemlisel çalışmaya panoramik radyografisi ve eşleşik CBCT'si bulunan 600 yetişkin dahil edildi. Etiketler, CBCT altın standart kabul edilerek Roboflow'da oluşturuldu. Panoramik bulgulara göre düşük, orta ve yüksek risk tanımlandı; CBCT yalnızca doğrulamada kullanıldı. YOLOv8 tabanlı model yalnızca panoramik görüntülerle eğitildi; 90° döndürme ve $\pm 15^\circ$ rotasyon ile artırma uygulandı. Model başarımı precision, recall, F1, mAP@0.5 ve mAP@0.5–0.95 ile raporlandı. Cerrahi sonrası parestesi klinik izlemle kaydedildi. Çekim endikasyonu konulan 515 dişin dağılımı: düşük 185, orta 172, yüksek 158.

Bulgular : Eğitim ve doğrulama kayıpları paralel biçimde azaldı. Model F1 $\approx 0,70$, mAP@0.5 $\approx 0,72$ ve mAP@0.5–0.95 $\approx 0,65$ değerlerine ulaştı. Parestesi orta risk grubunda 1 olguda ve yüksek risk grubunda ise 2 olguda izlendi; düşük risk grubunda parestesi görülmeye.

Sonuç : Yalnız panoramik girdiyi kullanan ancak CBCT-referanslı etiketlemeyle eğitilen derin öğrenme yaklaşımı, klinik sonuçlarla uyumlu üç basamaklı risk tabakalandırması sağlamıştır. Bu yaklaşım preoperatif bilgilendirme ve cerrahi planlamayı destekleyebilir; ancak çok merkezli diş doğrulama ve etki analizi çalışmalarına ihtiyaç vardır.

Anahtar Kelimeler : Derin öğrenme, Inferior alveoler sinir, Parestesi

DEEP LEARNING-BASED PARESTHESIA RISK OF THE INFERIOR ALVEOLAR NERVE: CBCT-REFERENCED CLINICAL STUDY

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Abstract

Objective : To develop a CBCT-referenced deep learning model based on panoramic radiographs that stratifies the risk of paresthesia following mandibular third molar surgery into three levels, and to relate these findings to clinical outcomes.

Materials and Methods : In this single-center observational study conducted at Batman University in 2025, 600 adults with panoramic radiographs and matched CBCT scans were included. Labels were created in Roboflow, with CBCT accepted as the gold standard. Based on panoramic findings, low, moderate, and high risk categories were defined; CBCT was used only for validation. The YOLOv8-based model was trained exclusively on panoramic images, with data augmentation applied using 90° flipping and $\pm 15^\circ$ rotation. Model performance was reported using precision, recall, F1, mAP@0.5, and mAP@0.5–0.95. Postoperative paresthesia was recorded through clinical follow-up. Among the 515 teeth indicated for extraction, the distribution was as follows: low risk 185, moderate risk 172, and high risk 158.

Results : Training and validation losses decreased in parallel. The model achieved F1 ≈ 0.70 , mAP@0.5 ≈ 0.72 , and mAP@0.5–0.95 ≈ 0.65 . Paresthesia occurred in 1 moderate and 2 high-risk cases; none in the low-risk group.

Conclusion : The deep learning approach trained with CBCT-referenced labeling but using only panoramic input achieved a three-tier risk stratification consistent with clinical outcomes. This approach may support preoperative counseling and surgical planning; however, multicenter external validation and impact analysis studies are needed.

Key words : Deep learning, Inferior alveolar nerve, Paresthesia

GİRİŞ

Mandibular üçüncü molarlar toplumda “yirmi yaş dişi” olarak bilinen dişlerdir. Bu dişlerin fizyolojik olarak arkta fonksiyonel konumlarını alamamaları oldukça sık karşılaşılan bir durumdur. Söz konusu gömülü kalma eğilimi; mandibular arkın boyutsal yetersizliği, sürme yolundaki mekânsal kısıtlılıklar veya komşu dişlerin oluşturduğu direnç gibi çeşitli etyolojik faktörlere bağlanmaktadır. Literatürde bu tip gömülüük olgularının görülmeye sıklığı %22 ile %54 arasında değişen oranlarda rapor edilmiştir (1). Inferior alveoler sinir, trigeminal sinirin mandibular dalının bir uzantısıdır. Temel olarak mandibula içerisinde yer alan dişlerin pulpası, periodontal dokular ve alveolar kemik ile ön dişlerin duyusal innervasyonundan sorumludur. Bu sinir aracılığıyla dokunma ve ağrı gibi somatosensoriyel uyarılar iletilmektedir (2). Mandibular üçüncü molarların cerrahi olarak uzaklaştırılması sırasında inferior alveoler sinir; kullanılan cerrahi enstrümanların doğrudan etkisiyle veya diş köklerinin yer değiştirmesi ve sinire uygulanan bası gibi dolaylı mekanizmalar aracılığıyla zarar görebilir. Bu tür yaralanmalar hasta alt dudak, çene bölgesi ve gingival dokularda uyuşukluk ya da anormal duyumların ortayamasına neden olabilmektedir (3).

Gömülü üçüncü molarların cerrahi olarak çıkarılmasında uygulanan osteotomi, dünya genelinde en sık gerçekleştirilen ağız ve diş cerrahisi işlemlerinden biri olarak kabul edilmektedir. Operasyon sırasında diş ile çevresindeki anatomičk yapılar arasındaki yakın komşuluk, inferior alveoler sinirde %0,4–5,5 ve lingual sinirde %0,06–10 arasında bildirilen yaralanma riskleriyle ilişkilendirilmektedir. Ayrıca bu cerrahi girişimler sonrasında kalıcı duyusal bozukluk görülmeye oranının %0,4 ile %13 arasında değiştiği rapor edilmiştir (4). Literatürde cerrahi sırasında nörovasküler yapının doğrudan gözle görünür hale getirilmesinin dahi operasyon sonrası parestezî gelişme riskini anlamlı ölçüde artırdığı ve bu riskin yaklaşık %20 oranında seyrettiği bildirilmektedir (5). Literatürde inferior alveoler sinir yaralanmasıyla ilişkili olarak yaş, uygulanan anestezinin düzeyi, cerrahın tecrübesi ve operasyon sırasında sinir kanalının ekspozisyonu gibi pek çok risk faktörü tanımlanmıştır. Bu etkenler içerisinde özellikle diş köklerinin inferior alveoler sinir kanalına olan yakınlığı ve konumlanması en belirleyici parametreler arasında değerlendirilmektedir (6). Ying Chai ve arkadaşları (2024) tarafından gerçekleştirilen prospektif kohort çalışmada gömülü alt çene üçüncü molar diş ile inferior alveoler sinir kanalı arasındaki baskılı temasın, geçici sinir hasarında %36,4 oranında ve kalıcı sinir hasarında %18,2 oranında meydana geldiği bildirilmektedir. Bu durum diş-sinir mesafesinin sinir yaralanması açısından güçlü bir risk faktörü olduğunu göstermektedir (7).

Yapay zekâ teknolojilerinin tıpta kullanımı son yıllarda belirgin şekilde artış göstermiştir. Özellikle bilgisayarla görme alanında önemli gelişmeler kaydedilmiştir. Bu teknolojilerin benimsenmesini sağlayan çeşitli etkenler literatürde tanımlanmıştır (8). Öncelikle tanışsal görüntüleme birçok sağlık alanında merkezi bir rol oynamakta olup yapay zekâ öznel değerlendirmelerdeki değişkenliği azaltmak, bakımın etkinliğini artırmak ve rutin görevleri otomatikleştirerek maliyetleri düşürmek açısından oldukça elverişlidir (9).

Bu çalışmanın amacı, panoramik radyografilerden elde edilen veriler aracılığıyla derin öğrenme tabanlı bir model geliştirerek mandibular üçüncü molar cerrahisi sonrası inferior alveoler sinir yaralanma riskini öngörmektir. Geleneksel radyografik işaretler ve CBCT değerlendirmeleri risk tahmininde değerli bilgiler sunmakla birlikte panoramik radyografının sınırlı duyarlılığı ve CBCT'nin rutin kullanımındaki maliyet ile radyasyon dezavantajları daha yenilikçi yöntemleri gerekli kılmaktadır. Derin öğrenme tabanlı yapay zekâ modelleri ise bu bağlamda klinik karar destek sistemlerinin geliştirilmesi ve komplikasyonların azaltılmasına katkı sağlayabilecek yenilikçi ve güçlü bir potansiyel sunmaktadır.

GEREÇ VE YÖNTEM

Bu çalışma 2025 yılında Batman Üniversitesi Ağız Diş ve Çene Cerrahisi Kliniği'nde yürütülen tek merkezli gözlemsel bir araştırmadır. Çalışmaya 18 yaş ve üzeri, sistemik olarak sağlıklı ve en az bir mandibular üçüncü molar dişe sahip toplam 600 hasta dahil edilmiştir. Tüm olgularda panoramik radyografiler incelenmiş ve etiketleme doğrulaması amacıyla konik ışıklı bilgisayarlı tomografi (CBCT) görüntüleri kullanılarak altın standart oluşturulmuştur.

Dahil edilme kriterleri; 18 yaş ve üzeri olmak, sistemik olarak sağlıklı bulunmak, en az bir mandibular üçüncü moların mevcut olması ve hem panoramik radyografi hem de CBCT görüntülerinin mevcut olmasıdır. Çalışmaya dahil edilmeme kriterleri ise mevcut nörosensoriyel bozukluk öyküsü, mandibular bölgede geçirilmiş cerrahi öyküsü, teşhise uygun olmayan kalitede görüntülere sahip olmak, kemik metabolizmasını etkileyebilecek sistemik hastalık veya tedavi öyküsü (örneğin antirezorptif ilaç kullanımı, baş-boyun radyoterapisi) ve klinik veya radyolojik verileri eksik olan olgular olarak belirlenmiştir.

Risk sınıflaması panoramik radyografide inferior alveoler sinir (IAS) kanalı ile üçüncü molar kökleri arasındaki ilişkinin özelliklerine dayanarak yapılmış, CBCT yalnızca doğrulama amacıyla kullanılmıştır. Düşük risk grubunda kanal ile kök arasında belirgin mesafenin bulunduğu, kök çevresinde radyografik koyulaşma (darkening), kanal kortikal çizgisinde kesinti (interruption) veya doğrudan temas (contact) gibi risk işaretlerinin gözlenmediği ve CBCT'de kanalın genellikle bukkal veya kökten uzak seyrettiği olgular yer almıştır. Orta risk grubunda panoramik görüntüde kök ile kanal arasında yakın komşuluk bulunduğu ancak belirgin süperpozisyonun olmadığı, darkening veya contact gibi tekil orta risk işaretlerinin görüldüğü ve CBCT'de kökle temas olmasına rağmen kortikal sınırın korunduğu olgular değerlendirilmiştir. Yüksek risk grubunda ise panoramikte birden fazla risk işaretinin birlikte bulunduğu (örneğin darkening ile birlikte kanal çizgisinde kesilme veya belirgin süperpozisyon), köklerin kanal üzerinde veya kanal çevreler şekilde konumlandığı, CBCT'de ise kanalın sıkılıkla lingual ya da interradiküler pozisyonda izlendiği ve bazı olgularda lingual korteks perforasyonunun eşlik ettiği durumlar sınıflandırılmıştır. Bu sınıflama klinik açıdan sırasıyla düşük, orta ve yüksek parestesi olasılığına karşılık gelmektedir.

Tüm görüntüler CBCT referans alınarak Roboflow platformunda etiketlenmiştir (Resim 1). Etiketleme sürecinde CBCT bulguları yalnızca referans standart (ground truth) oluşturmak amacıyla kullanılmış, derin öğrenme modeli ise yalnızca panoramik radyografileri girdi olarak almıştır. Etiketlenmiş veri kümlesi, Google Colab Pro ortamında A100 GPU üzerinde YOLOv8 tabanlı derin öğrenme modeli ile eğitilmiştir. Modelin genellenebilirliğini artırmak amacıyla eğitim veri kümnesine görüntü artırma (augmentation) işlemleri uygulanmış; bu kapsamda panoramik radyografiler 90° döndürme ve $\pm 15^{\circ}$ rotasyon transformasyonlarına tabi tutulmuştur. Veriler eğitim, doğrulama ve test alt kümelerine ayrılmış modelin performansı bağımsız test kümlesi üzerinde değerlendirilmiştir.

Klinik izlem kapsamında toplam 515 diş cerrahi çekim endikasyonu konulmuştur. Çekilen dişlerin risk gruplarına göre dağılımı düşük risk grubunda 185, orta risk grubunda 172 ve yüksek risk grubunda 158 diş şeklindedir. Çalışmaya dahil edilen hastaların cerrahi sonrası nörosensoriyel durumları düzenli klinik muayenelerle takip edilmiştir. Parestesi varlığı ya da yokluğu klinik sonuç değişkeni olarak kaydedilmiş, model eğitiminde kullanılmamış yalnızca diş geçerlik amacıyla değerlendirilmiştir.

Yapay zekâ modelinin performansı kesinlik (precision), duyarlılık (recall), F1 skoru ve ortalama doğruluk (mean average precision, mAP) ölçütleri üzerinden değerlendirilmiştir. Bu metrikler modelin tahminlerinin gerçek etiketlerle karşılaştırılması yoluyla hesaplanmış ve sonuçlar karşılaştırmalı olarak raporlanmıştır.

BULGULAR

Çalışmaya dahil edilen 600 hastanın panoramik radyografileri, belirlenen üç risk grubuna eşit sayıda (200 hasta) dağıtıldı. Toplam 515 diş için cerrahi çekim endikasyonu konuldu. Risk gruplarına göre çekilen diş sayıları düşük risk grubunda 185, orta risk grubunda 172 ve yüksek risk grubunda 158 olarak kaydedildi. Cerrahi sonrası yapılan nörosensoriyel değerlendirmelerde düşük risk grubunda parestesi olgusuna rastlanmadı. Orta risk grubunda 1 hasta, yüksek risk grubunda ise 2 hasta parestesi geliştiği saptandı (Resim 2) ve bu olguların klinik takipleri devam etmektedir.

Yapay zekâ modelinin eğitim süreci boyunca kayıp (loss) değerlerinde düzenli bir azalma gözlandı. Eğitim ve doğrulama kayıplarının epochlar boyunca paralel seyretmesi, modelin aşırı öğrenme eğilimi göstermediğini ortaya koydu.

Modelin F1 skoru eğitim süresince dalgalı bir seyir izlemekle birlikte zaman içinde belirgin artış göstermiş ve 0.70 düzeyine ulaşmıştır. Ortalama doğruluk ölçütleri incelemişinde, mAP@0.5 değerinin yaklaşık 0.72 seviyelerine çıktıığı, mAP@0.5–0.95 değerinin ise 0.65 civarında seyrettiği belirlenmiştir. Bu bulgular modelin özellikle düşük IoU eşiklerinde yüksek başarıyı gösterdiğini, daha zorlayıcı eşiklerde ise kabul edilebilir düzeyde performans sergilediğini ortaya koymaktadır.

TARTIŞMA

Mandibular üçüncü molar (M3) dişlerin çekimi sürmüş ya da gömülü olmalarına bakılmaksızın ağız diş ve çene cerrahisi pratiğinde en sık gerçekleştirilen dentoalveoler cerrahi girişimlerden birini oluşturmaktadır (10). Gömülü mandibular üçüncü molarların çekimine yönelik endikasyonlar literatürde ayrıntılı biçimde tanımlanmıştır. Asemptomatik M3'lerin profilaktik olarak uzaklaştırılmasına dair süregelen tartışmalar cerrahi işlemin getirdiği risklerin ve maliyetlerinin, tedavi edilmemesi halinde ortaya çıkabilecek olası komplikasyonlarla karşılaşmasına dayanmaktadır. Profilaktik çekim kararını destekleyen başlıca gerekçeler arasında kist ve tümör gelişim riskinin azaltılması, mandibula angulus kırığı olasılığının düşürülmesi, yaşla birlikte cerrahının güçleşmesi, tedavi edilemeyecek düzeyde çürük veya periodontal hastalıkların önlenmesi ve üçüncü molarların fonksiyonel açıdan sınırlı katkılar sağlama gibi etkenler bulunmaktadır (11). Cerrahi sonrası inferior alveoler sinir hasarlarının yaklaşık %96'sı 4–8 hafta içerisinde spontan olarak düzelmektedir (12). Bu iyileşme sürecinde cinsiyetin belirgin bir etkisi bulunmazken yaş faktörünün yalnızca sınırlı düzeyde rol oynadığı bildirilmektedir (13).

Inferior alveolar nerve (IAN) injury is one of the risk factors that can lead to complications in the treatment of third molar extraction. The risk factors include the depth of the canal, the position of the nerve, the degree of the canal curvature, and the position of the nerve relative to the canal. The risk of nerve injury is higher in the extraction of third molars compared to other teeth. The risk of nerve injury is also higher in the extraction of third molars compared to other teeth. The risk of nerve injury is also higher in the extraction of third molars compared to other teeth.

CBCT's referential standard is the use of deep learning models to improve the reliability of nerve identification. Nitakim Soltani and others (2024) used a Faster R-CNN model to identify the nerve in CBCT images. In our study, we used a YOLOv8 model to identify the nerve in CBCT images. The results showed that the YOLOv8 model was able to identify the nerve with a high degree of accuracy. The results also showed that the nerve was located in the same position in all three subjects. The nerve was located in the same position in all three subjects. The nerve was located in the same position in all three subjects.

Ulusoy and others (2025) used a panoramic radiograph to identify the nerve in the extraction of third molars. The results showed that the panoramic radiograph was able to identify the nerve with a high degree of accuracy. The results also showed that the nerve was located in the same position in all three subjects. The nerve was located in the same position in all three subjects.

Al Salieti and others (2025) used a panoramic radiograph to identify the nerve in the extraction of third molars. The results showed that the panoramic radiograph was able to identify the nerve with a high degree of accuracy. The results also showed that the nerve was located in the same position in all three subjects. The nerve was located in the same position in all three subjects.

SONUÇ

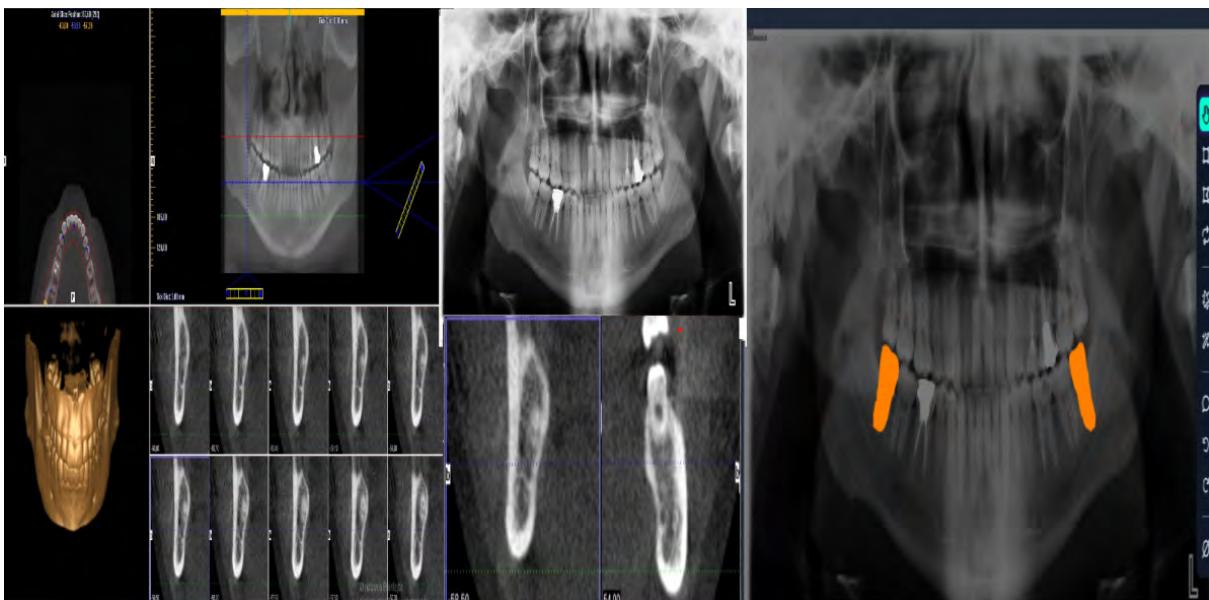
This study used CBCT as a referential standard for nerve identification. The results showed that the CBCT was able to identify the nerve with a high degree of accuracy. The results also showed that the nerve was located in the same position in all three subjects. The nerve was located in the same position in all three subjects.

KAYNAKÇA

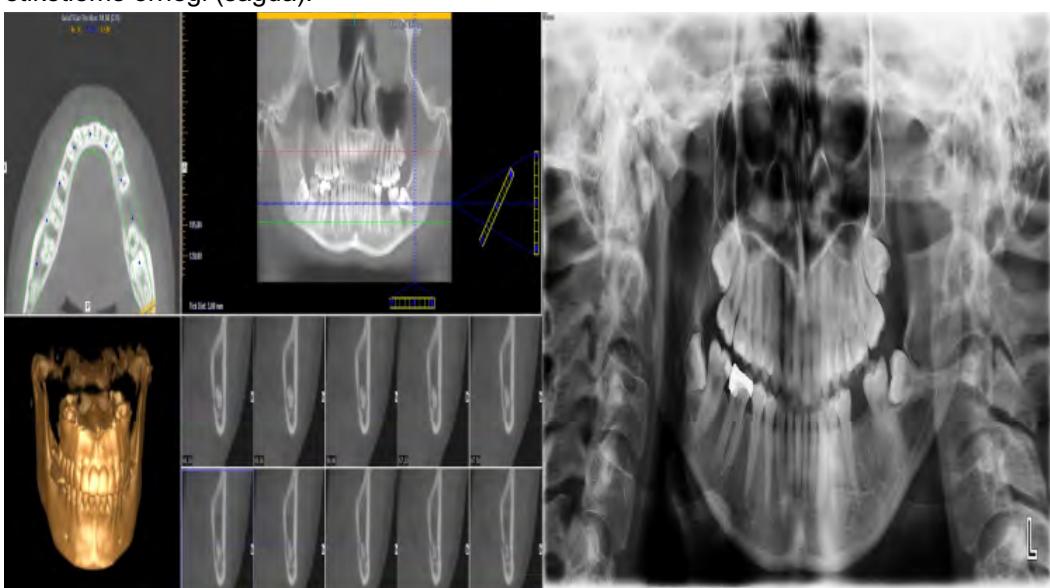
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RESİMLER



Resim 1: Aynı hastaya ait CBCT kesiti (solda), panoramik radyografi (ortada) ve Roboflow platformunda yapılan etiketleme örneği (sağda).



Resim 2: Parestezi gelişen yüksek riskli hastaya ait CBCT görüntüsü (solda), panoramik radyografisi (sağda)

SS-021

Gömülü Mandibular Üçüncü Molar Dişin Transservikal Yaklaşım ile Cerrahi Çekimi ve Literatür Derlemesi

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Giriş; Transservikal cerrahi yaklaşım, derin gömülü üçüncü molar diş vakalarında, intraoral erişimin yetersiz kaldığı durumlarda tercih edilen bir yöntemdir. Cerraha geniş ve doğrudan bir görüş alanı sunarak kontrollü osteotomi ve atravmatik diş çekimi sağlar. Kortikal perforasyon, kistik lezyon, trismus veya fasiyal enfeksiyon gibi komplikasyonların eşlik ettiği olgularda cerrahi güvenliği artırır bir alternatiftir.

Vaka; 64 yaşında erkek hasta, ekstraoral şişlik ve trismus şikayetleriyle başvurdu. Radyolojik incelemelerde, mandibular üçüncü molar dişin derin kemik dokusu içinde gömülü olduğu ve çevresinde bukkal ve lingual korteksi perfore eden radyolusent kistik bir lezyon saptandı. Dişin konumu ve ağız açılığındaki kısıtlılık nedeniyle transservikal yaklaşımla dişin çekimi planlandı. Olası iatrojenik mandibula kırığı riskine karşı rekonstrüksiyon plağı uygulanmasına karar verildi. Hastanın 3D mandibula modeli elde edilerek rekonstrüksiyon plağı önceden şekillendirildi. Diş atravmatik şekilde çekildi, kistik doku enükle edildi. Hemovak yerleştirildi ve bölge suture edildi.

Sonuç; Gömülü mandibular üçüncü molar diş çekiminde geleneksel intraoral yaklaşımlar çoğu vakada yeterli olsa da, bazı olgularda erişim güçlüğü, komplikasyon riski ve anatomi sınırlamalar nedeniyle alternatif tekniklerin uygulanması gerekebilir. Bu bağlamda, bukkal kortikotomi, piezoelektrik cerrahi destekli osteotomi ve transservikal yaklaşımlar gibi yöntemler, cerrahi başarıyı artırmak ve postoperatif morbiditeyi azaltmak amacıyla geliştirilmiştir. Bu olgu, derin gömülü mandibular üçüncü molar diş ile birlikte bukkal ve lingual korteksi perfore etmiş kistik lezyonun tedavisinde transservikal yaklaşımın güvenli ve etkili bir seçenek olduğunu göstermektedir. Transservikal yaklaşımla sağlanan geniş cerrahi erişim, hem mandibular üçüncü molar dişin çekimini hem de kistik dokunun tam enükleasyonunu mümkün kılmıştır. Rekonstrüksiyon plağı ve 3D modelleme ile yapılan ön hazırlık, cerrahi stabiliteti ve öngörülebilirliği artırmış; postoperatif dönemde komplikasyon izlenmemiştir.

Anahtar Kelimeler; Derin Gömülü Diş, Transservikal Yaklaşım, Rekonstrüksiyon Plağı

Surgical Extraction of an Impacted Mandibular Third Molar via Transcervical Approach and Literature Review

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Introduction: The transcervical surgical approach is preferred in cases of deeply impacted mandibular third molars where intraoral access is insufficient. It provides the surgeon with a wide and direct field of view, allowing controlled osteotomy and atraumatic tooth extraction. In cases accompanied by complications such as cortical perforation, cystic lesions, trismus, or facial infections, it offers a safer alternative for surgical intervention.

Case Report: A 64-year-old male patient presented with complaints of extraoral swelling and trismus.

Radiological examination revealed a deeply impacted mandibular third molar located within the bone tissue, surrounded by a radiolucent cystic lesion perforating both the buccal and lingual cortices. Due to the tooth's position and restricted mouth opening, extraction via a transcervical approach was planned. To prevent a potential iatrogenic mandibular fracture, the application of a reconstruction plate was decided. A 3D mandibular model was obtained, and the reconstruction plate was pre-shaped accordingly. The tooth was extracted atraumatically, and the cystic tissue was enucleated and sent for pathological examination. A hemovac drain was placed, and the surgical site was sutured.

Conclusion: Although conventional intraoral approaches are sufficient in most cases of impacted mandibular third molar extraction, alternative techniques may be required in certain cases due to limited access, increased risk of complications, and anatomical constraints. In this context, methods such as buccal corticotomy, piezoelectric-assisted osteotomy, and transcervical approaches have been developed to enhance surgical success and reduce postoperative morbidity. This case demonstrates that the transcervical approach is a safe and effective option for the treatment of a deeply impacted mandibular third molar associated with a cystic lesion perforating both buccal and lingual cortices. The wide surgical access provided by the transcervical route enabled both the extraction of the third molar and complete enucleation of the cystic tissue. Preoperative preparation with a reconstruction plate and 3D modeling improved surgical stability and predictability, with no complications observed in the postoperative period.

Keywords: Deeply Impacted Tooth, Transcervical Approach, Reconstruction Plate

SS-022

Bone Lid Tekniği İle Çene Cerrahisinde Klinik Uygulamalar: Vaka Serisi Ve Sonuçlar

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Özet

Giriş:

Bone lid (kemik kapak) tekniği çenelerde kistik-tümöral lezyonlar , gömülü dişler ,endodontik mikrosurji ve sinüs cerrahisine erişimde kortikal kemiğin geçici olarak kaldırılıp aynı seansda yerine geri yerleştirilmesine dayanan bir yöntemdir .Yeterli kalınlıktaki kemik kapağı, piezo veya mikromotor ile yapılan ince ve eğimli osteotomilerle optimize edilerek kolayca çıkarılabilir. Ameliyat sonunda kapağın tam olarak yerine oturtulması, kemik-kemik temas yüzeyini artırarak ek fiksasyon ihtiyacını azaltır ve revaskülarizasyonu desteklemektedir. Ancak stabilitenin yetersiz olduğu durumlarda, transkortikal vidalar, rezorbe olabilen veya metal miniplaklar, sütürler ya da tellerle fiksasyon uygulanabilir.Kemik kapak tekniği ; kemik bütünlüğünü koruması, iyileşmeyi hızlandırması, defekt oluşumunu azaltması ve anatomik yapırlara zarar vermemesi nedeniyle özellikle zor gömülü dişler, mandibular alt sınır lezyonları, kist/tümör enükleasyonları ve implant çıkarma vakalarında tercih edilmektedir.

Vaka raporu:

Fakülte kliniğimize 2019–2025 yılları arasında başvuran ve kistik/tümöral lezyon ya da gömülü diş nedeniyle cerrahi girişim planlanan 17 hasta bone lid tekniği ile opere edildi. Hastaların yaşları 15-69 arasında değişmekteydi. Olguların 11 'i derin yerleşimli gömülü dişlere sahipken, diğer 6'sı kistik veya tümöral lezyon saptandı. Tüm operasyonlar piezocerrahi cihazı kullanılarak, kemik ve yumuşak dokuya minimum travma prensibiyle gerçekleştirildi. Kemik kapağının stabilizasyonunu sağlamak amacıyla 9 hastada miniplak ve vida uygulandı; diğer 8 hastada ise herhangi bir ek fiksasyon materyaline ihtiyaç duyulmadı. Postoperatif değerlendirmeler, hem erken dönemde (1. hafta) hem de geç dönemde (6. ay) düzenli kontrollerle yapıldı ve iyileşme süreci yakından takip edildi.

Sonuç:

Bone lid tekniği, kemik bütünlüğünü koruyarak geniş defektlerde epitel migrasyonunu engeller ve ossifikasyon için doğal bir iskelet görevi görür. Böylece konvansiyonel yöntemlerde olduğu gibi bukkal kortikal kemiğin büyük miktarlarda kaybedilmesi önlenir. Sonuç olarak bu yöntem, kemik hacminin korunmasına katkı sağlarken postoperatif enfeksiyon riskini de azaltır.

Anahtar Kelimeler: Bone lid , Piezo cerrahi, Kemik kapak

Abstract

Introduction:

The bone lid technique is a surgical approach in which a segment of cortical bone is temporarily removed and subsequently repositioned in the same session to access cystic or tumoral lesions, impacted teeth, endodontic microsurgery sites, or the maxillary sinus. By performing thin and bevelled osteotomies using piezoelectric or micromotor-assisted instruments, a bone lid with sufficient thickness can be removed with minimal trauma. Precise repositioning of the bone lid at the end of the procedure increases the bone-to-bone contact surface, thereby reducing the need for additional fixation and promoting rapid revascularization. In cases where primary stability cannot be achieved, fixation with trans-cortical screws, resorbable or titanium miniplates, sutures, or wiring may be required. Owing to its ability to preserve bone integrity, accelerate healing, minimize defect formation, and prevent injury to adjacent anatomical structures, the bone lid technique is particularly useful in the management of deeply impacted teeth, inferior mandibular border lesions, cyst/tumor enucleations, and implant retrieval procedures.

Case Report:

Between 2019 and 2025, a total of 17 patients who presented to our faculty clinic with cystic/tumoral lesions or deeply impacted teeth were surgically treated using the bone lid technique. The patients ranged in age from 15 to 69 years. Eleven cases involved deeply impacted teeth, whereas six patients were diagnosed with cystic or tumoral lesions. All procedures were performed using a piezosurgical device in accordance with the principle of minimal trauma to both bone and soft tissues. Stabilization of the bone lid was achieved using miniplates and screws in 9 patients, while no additional fixation was required in the remaining 8 cases. Postoperative follow-up was conducted both in the early phase (1st week) and in the late phase (6th month), during which the healing process was closely monitored.

Conclusion:

The bone lid technique preserves cortical bone continuity, prevents epithelial downgrowth in large defects, and provides a natural osseous scaffold that facilitates ossification. Unlike conventional approaches, it avoids significant loss of the buccal cortical plate. Consequently, this method contributes to the preservation of bone volume while reducing the risk of postoperative infection.

Keywords: Bone lid technique, piezosurgery, cortical bone window.

GİRİŞ:

Çene bölgesinde görülen kistik ve tümöral lezyonlar ile derin gömülü dişler hem fonksiyonel hem de estetik açıdan önemli sorunlara yol açabilen ve cerrahi müdahale gerektiren patolojilerdir. Kistik lezyonların geleneksel cerrahi yaklaşımları enükleasyon, küretaj, marsupyalizasyon ve dekompreşyon, kimyasal küretaj eşliğinde enükleasyon, geniş ostektomi, rezeksiyondur. Cerrahi çekim, etkilenen dişler için en sık kullanılan tedavi yöntemidir. (1)Alveolar kemik hastalıklarının uzaklaştırılması, hem hastalığın kendisinden hem de cerrahi sırasında lezyona erişim ve görüş sağlamak amacıyla yapılan ostektomilerden kaynaklanan volümetrik kemik defektlerine yol açabilir. Operasyon sonrası morbidite, iyileşme süresinin uzaması ve kemik bütünlüğünde zayıflama gibi komplikasyonlara sebep olabilir.Bu duruma alternatif olarak, kistik lezyonların endoskop yardımıyla enükleasyonu ve "bone lid" (kemik kapak) tekniği gibi yöntemler önerilmiştir.(2,7)

Bone lid tekniği ilk olarak Schenk ve Willeneger (1975) tarafından tanımlanmış olup maksillofasiyal cerrahide koruyucu ve minimal invaziv bir yaklaşım olarak kullanılmaktadır (Schenek ve Willenegger 1975) . Bu teknik ilk olarak maksiller antrumun açılmasını takiben kapatılması ve alt azı dişlerin endodontik cerrahi tedavisi için iyi sonuçlanmıştır. (3) Ayrıca odontojenik kistiklerin enükleasyonu, odontojenik tümörlerin eksizyonu, sinüs lifting, gömülü diş çekimleri ve hatta dental implant cerrahisi gibi geniş bir kullanım alanına sahip olduğu bildirilmiştir. Bone lid tekniğinin amacı, cerrahi sırasında daha iyi görüş sağlarken aynı zamanda kemik defekti oluşumunu önlemek ve anında rekonstrüksiyon yaklaşımıyla kemik dokusunu korumaktır. Bu yöntem, ince osteotomi aletleri yardımıyla bir kemik penceresi (veya kapak) oluşturulmasını içerir. Bu kapak cerrahi alana erişim sağlamak için çıkarılır ve işlem sonunda orijinal pozisyonuna geri yerleştirilir.Böylece kortikal kemiğin korunması sağlanır, iyileşme süreci hızlanır ve defekt bölgesinde yeni kemik oluşumu desteklenir.(4) Osteosentezi kolaylaştırmak amacıyla genellikle miniplaklar, teller, transfiksasyon vidaları, emilebilir veya emilmeyen sütürler, akrilik doku yapıştırıcıları veya bu materyallerin kombinasyonları kullanılarak riyit şekilde sabitlenir. Ancak, repoze edilen kemik kapağının yeterli stabilitesi varsa, ilave fiksasyon gerekmekz. Fiksasyon yöntemi seçilirken temel kriter, kemik

fragmanlarında hareketliliğin olmaması olmuştur.(5,6)Khoury, mikromotor testere kullanarak bone lid teknğiyle tedavi edilen 200 ardışık hastadan oluşan prospektif bir seride, başarılı kemik iyileşmesi ve alveolar kemik hacminin korunumu bildirmiştir; bu da özellikle dental implant yerleştirilmesi amacıyla avantaj sağlamıştır.(2)

Bu çalışmanın amacı, bone lid tekniginin bir klinik vaka serisindeki etkinliğini araştırmaktır.

Olgular en az altı ay süreyle klinik ve radyografik olarak takip edilmiş, işlemin başarısı kemik kapağının entegrasyonu, alveolar kemik hacminin geri kazanımı ve gözlenen komplikasyonlar temelinde değerlendirilmiştir.

YÖNTEM:

2.1. Hasta Seçimi: Bu retrospektif klinik çalışması için Eylül 2019- Haziran 2025 tarihleri arasında Çukurova Üniversitesi Diş Hekimliği Fakültesi Ağız ve Çene Cerrahisi Bölümü'nde koni işinli bilgisayarlı tomografi (CBCT) kullanılarak klinik ve radyografik olarak incelenen mandibular lezyonlu ve derin gömülü diş olan 17 hastayı içeriyoordu. Çalışmaya 15-61 yaş arası 17 hasta (9 kadın ve 8 erkek) dahil edildi.

Dahil etme kriterleri aşağıdaki gibidir: maksiller - mandibular bölgede bulunan bir kemik lezyonunun (kistler, iyi huylu tümörler veya etkilenen dişler) çıkarılması ihtiyacı, lezyon boyutu (çap) ≥ 1 cm ve en az 1 mm kalınlığında, yeterli boyutta ve bütünlüğe sahip vestibüler kortikal kemik duvarının varlığı (kemik kapağın çıkarılıp yeniden yerine yerleştirilebilmesi için), derin gömülü ve sinüs / mandibular kanal yakınlığı fazla olan dişler, en az 6 aylık klinik ve radyografik takip ziyaretlerine katılabilecek olması. Ayrıca, dahil edilen tüm hastalar yazılı bilgilendirilmiş onam verdi ve ameliyattan sonra altı ay boyunca klinik ve radyolojik takip ziyaretlerini tamamladı.

Dislama kriterleri şu şekildeydi: Kemik metabolizmasını etkileyen ilaçlar alan hastalar, son 12 ay içinde baş ve boyun radyoterapisi görenler, hamile hastalar ve ağır sigara içen hastalar (≥ 40 paket yıl).

2.2. Cerrahi Prosedürler:

Tüm işlemler genel anestezi ve /veya lokal anestezi altında steril koşullarda, gerçekleştirildi. Lokal anestezi altında yapılan iki işlem de kistik radyolüsent lezyonu ve lezyon boyutu küçüktü. Bölgeye bağlı olarak bukkal kemiğe ulaşacak şekilde yeterli boyut ve tasarıma sahip tam kalınlıkta bir flap kaldırıldı. Hastaların hepsinde osteotomi ucu piezoelektrik bir cihaz kullanılarak bir kemik penceresi oluşturuldu. Oluşturulan kemik pencere, lezyonun orijinal, radyografik olarak önceden değerlendirilmiş boyutundan en az 3-5 mm daha büyüktü.

Piezocerrahi ucu normal bukkal kortikal plakadan ve içe dönük eğimli (internal bevel) bir şekilde trabeküler kemiğe doğru yönlendirildi. Açılı bir keski kullanılarak kemik kapak hafifçe serbest bırakıldı ve serum fizyolojik çözeltisine yerleştirilerek operasyon süresince kemik penceresinin ve gerekli olduğu takdirde plak yerlerinin morfolojisinin bozulmamasına özen gösterilmiştir. Daha sonra lezyon eksizyonu ve/veya diş çekimi yapıldıktan sonra kemik kapak orijinal konumuna geri getirildi. 9 olguda pasif adaptasyon yeterli olurken 8 hastada stabilizasyon için miniplak ve vida kullanıldı. İşlemin sonunda mukoperiosteal flap esnetildi ve 3/0 vycril sütür kullanılarak suture edildi. Gerekirse, cerrahi örnekler histolopatolojik inceleme için Çukurova Üniversitesi Patoloji Bölümüne gönderildi. Ameliyat sonrası tüm hastalara uygun tıbbi ve fiziksel postoperatif tedavi protokolü uygulanmıştır.

Yedi gün boyunca günde iki kez amoksisin + klavulanik asit (1 g/125 mg), yedi gün boyunca günde üç kez steroid olmayan antiinflamatuar ilaçlar ve iki hafta boyunca günde üç kez klorheksidin gargara (%0,12) yer aldı. Cerrahiden 2 hafta sonra dikişler alınmıştır.

2.3. Sonuçlar : Bu seride yer alan 17 hasta, farklı endikasyonlarla bone lid teknigi uygulanarak tedavi edilmiştir.

Dahil edilen hastaların endikasyonları şunlardı:

n=2 çene kisti

n=4 odontojenik tümör

n=11 sinir veya sinüs ile ilişkili derin gömülü diş

2.4. Klinik bulgular:

Tüm hastalar ameliyattan bir hafta, bir ay ve altı ay sonra cerrahi değerlendirmeye tabi tutuldu. Ameliyat bölgesi yumuşak dokuların renk değişikliği, inflamasyon, nekroz, süpürasyon veya kemik ekspozisyonu açısından değerlendirilmiştir. Ayrıca, komşu dişler veya sinirlerle ilişkili erken ve geç komplikasyonlar kaydedilmiştir. Cerrahi işlemi takiben 2. haftadaki klinik kontrolde, tüm hastalarda yumuşak dokuların primer iyileşme ile kapandığı ve normal renkte olduğu gözlenmiştir. Enflamasyon, nekroz, süpürasyon veya kemik kapağının (bone

lid) ekspozisyonu hiçbir hastada saptanmamıştır. 1 hastada, n. alveolaris inferior bölgesinde parestezi görülmüştür; 6. ay kontrolünde düzelleme görülmemiş ve kalıcı hale gelmiştir.

Miniplaklar, toplam 2 hastada (%11,1) çıkarılmıştır. Çıkarma nedenleri:

1 hastada implant ile protetik rehabilitasyon yapılabilmesi için çıkarılırken bir hastada radyolojik kontroller sırasında kemik kapağı nekrozu görülmüş ve plak sökülmüştür.

Bu sonuçlar, piezoelektrik cerrahiyle uygulanan bone lid tekniğinin, hem osteotomi hattında tam kemik bütünlmesi hem de defekt dolumu açısından yüksek başarı oranına sahip olduğunu göstermektedir.

2.5. Radyografik değerlendirme :

En az 6 aylık radyografi değerlendirmede reposisyon yapılan kemik kapağının iyileşmesi ve bütünlmesi, kistlerde nüks varlığı, kemik kapağının altında oluşan kemik dolgunluğu, kapağın pozisyonu ve kenarlarında boşluk olup olmadığı değerlendirilmiştir. Takipte CBCT veya panoramik radyografi kullanılmıştır.

GEÇ DÖNEM RADYOLOJİK BULGULAR:

12 olguda, osteotomi hattı 1 yıl sonunda tamamen kaybolmuş, kemik kapağının çevre kemikle tam bütünlüğü (mükemmel reintegrasyon) gözlenmiştir. 1 olguda kemik kapağı nekrozu ve sekestrasyon gelişmiştir. Bu hastada revizyon cerrahisi ile nekrotik kemik kapağı çıkarılmış ve sonrasında kemik defektinin kısmi dolumu gerçekleşmiştir. Radyolojik incelemelerde, 12 vakada rezidüel alveolar kemik defektinin dolduğu, ayrıca hiçbirinde enfeksiyon, kemik rezorpsiyonu veya kist nüksü bulgusuna rastlanmadığı saptanmıştır.

3. TARTIŞMA:

Bone lid yöntemi, farklı klinik durumlarda uygulanmaktadır ; derin gömülü dişlerin çekimi için (11), diş veya alveolar kemik lezyonlarına erişim sağlamak amacıyla (4,9), maksiller sinüs içine kaçan yabancı cisimlerin çıkarılması ve maksiller sinüs hastalıklarının tedavisinde(7) kırılmış veya başarısız dental implantların uzaklaştırılmasında (2), mandibular molarların cerrahi endodontik tedavisinde (8). Ayrıca Rattan ve arkadaşları mandibulanın arteriyovenöz malformasyonu (AVM) tedavisinde embolizasyon sonrasında bukkal kortikal kemik plağının çıkarılıp daha sonra yeniden yerine yerleştirildiği bir yöntem uygulamışlar ve bu yaklaşımla, mandibulanın orijinal anatomi yapısı korunmuş, aynı zamanda rezeksyonla ilişkili morbidite önlenmiştir.(10)

Ostektomiyle geniş kemik kaldırma işleminde hedefe ulaşmak için geri dönüşsüz kemik kaybı oluşur; kontur kaybı, mukoperiostal flebin yetersiz desteği ve daha büyük defektler postoperatif dönemi zorlaştırabilir. Bone lid yaklaşımı ise kemik pencereyi çıkarıp aynı seansta yerine koyarak kemik tasarrufu sağlar; defekt hacmini küçültür, flebe "rigid" bir dayanak bırakır, kemik birleşmesi/yenilenmesi için daha fizyolojik bir ortam yaratır ve yönlendirilmiş kemik rejenerasyonunda bariyer membranı işlevi görür (2,12). GBR prensiplerine benzer şekilde osteojenik hücrelerin korunup non-osteojenik hücre invazyonunun engellenmesine yardımcı olur ; bu da daha yüksek defekt dolumu ile sonuçlanabilir. (13)

Kemik kapağını şekillendirmek için kullanılan bir piezoelektrik cihaz sert dokuların seçici, doğru, ince bir şekilde kesimini sağlar, inferior alveolar sinir hasarı riskini azaltır, intraoperatif kanamayı sınırlar ve cerrahi alanın daha iyi bir görünümünü sağlar. (4) Bone lid tekniğinde keside hassasiyetin artırılması, kaldırılan kemik penceresinin işlem sonrasında anatomi uyumla tekrar yerine yerleştirilmesi açısından önemlidir. Diğer yazarlar da bone lid tekniğini piezoelektrik cerrahiyle kombinasyon halinde kullanmışlardır. (4,5,9,11) Manuel ve/veya mekanik aletlerin hassas yapılara (damarsal, sinir dokusu veya sinüs membranı) yakın bölgelerde kullanılması, kesim derinliğinin kontrol edilmesine izin vermez ve yanlışlıkla temas sonucu bu hassas yapılara zarar verebilir ve kalın osteotomi hattı nedeniyle bone lid geometrisini idealize etmek daha zor olabilir. 2024'te yayımlanan randomize bir klinik çalışmada (mandibula lezyonları; n=24), piezo ile yapılan bone lid tekniği, klasik rotatuvlar yöntemle kıyaslandığında 6. ayda daha yüksek defekt dolumu ve erken dönemde daha az ağrı ile üstün bulundu. (13)

Bu tekniğin başarısında en önemli faktör, kemik kapağının boyutunun yalnızca lezyonun büyülüğüyle değil, aynı zamanda kapağın yeniden bütünlmesi (reintegrasyonu) ile de uyumlu olmasıdır. Bu durum, bevel açılı (eğimli) tasarıma sahip bir kemik kapağı ile sağlanabilir; bu tasarım, rıjt fiksasyon gereksinimi olsa da olmasa da, kapağın kusursuz şekilde oturmasını sağlar. Rıjt fiksasyon planlanırsa, kemik kapağının uygun boyutta ve yeterli kalitede olması gereklidir. (3)

İnce ve bevel osteotomi çizgileriyle çıkarılan , kalınlığı iyi ayarlanmış bir pencere 'kilitli' geometrisi sayesinde çoğu olguda ek fiksasyon gerektirmeden stabil kalabilir.Bu durum revaskülarizayonu kolaylaştırır ve yabancı cisim/implant gereksinimini azaltır.(13) Stabilitenin şüpheli olduğu ,pencere kalınlığının az , segmentin uzun olduğu, geniş kavitelerde veya fonksiyonel stresin yüksek olduğu alanlarda fiksasyon önerilir.Literatürde transkortikal vidalar, miniplak -vidalar, tel , sütur ,akrilik doku yapıştırıcıları , emilebilir pinler gibi fiksasyon çeşitleri listelenmiştir.(11,17) Bone lid fiksasyon plakları, hastada rahatsızlık yaratmadığı ve ilerideki cerrahi işlemleri engellemediği sürece yerinde bırakılabilir (14).Bu çalışmada 8 vakada miniplak kullanılmış , plaklar %25 oranında çıkarılmıştır. Bu olguların %12.5' inde protetik rehabilitasyon (implant veya protez) yapılabilmesi amacıyla çıkarılmıştır. Literatürde , maksillofasiyal travma ve ortognatik cerrahi olgularında plak çalışma oranı %3 (14) ile %20,2 (15) arasında bildirilmiştir (çoğunlukla rahatsızlık veya fistül nedeniyle).Repoze edilen kemik kapağında hareketlilik, osteotomi hattının iyileşmesini olumsuz etkileyebilir, bu da kemik nekrozu veya sekestrasyon gelişimine yol açabilir.

Bu seride bone lid tekniği, kistik lezyonların tam enükleasyonunu ve cerrahi sahaya net bir erişimi mümkün kılmış, hiçbir olguda nüks görülmemiştir. Benzer şekilde, diğer araştırmacılar da bu yöntemin kist rekürrens riskini azalttığını bildirmiştir.(16) buna karşın Oh ve ark. retrospektif çalışmalarında, mandibular kistlere erişimde bone lid tekniğinin, konvansiyonel ostektomiye göre daha yüksek komplikasyon oranına sahip olduğunu bildirmiştir. Bu farkın nedeni, bone lid yönteminin yalnızca büyük kistlerde uygulanması ve lezyon boyutu farkının istatistiksel olarak anlamlı olmasıdır.(6)

SONUÇ:

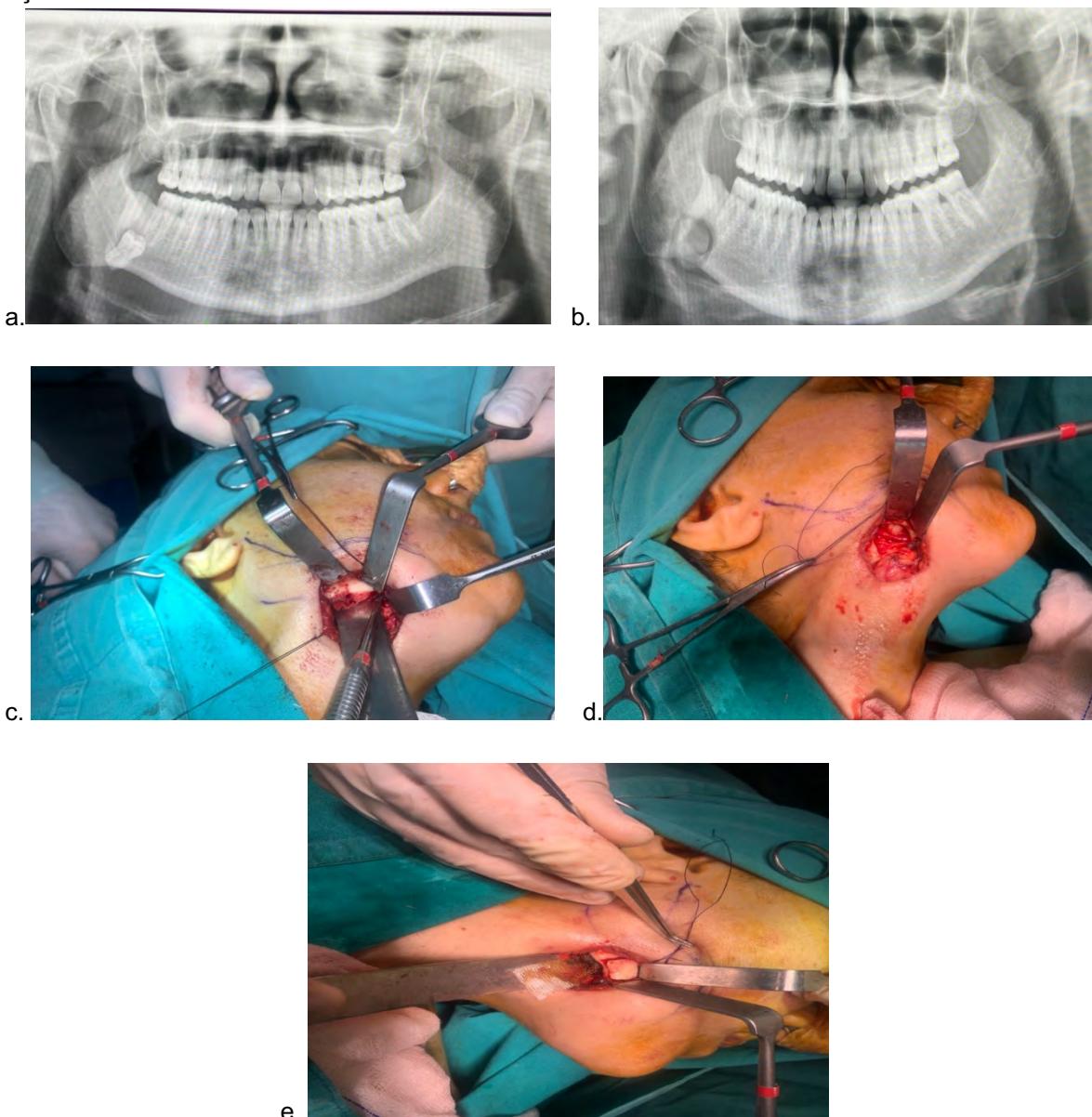
Bone lid tekniği , farklı endikasyonların tedavisi sonrasında geniş rezidüel kemik defektlerinin oluşumunu önleyerek ek kemik augmentasyon işlemlerine duyulan ihtiyacı azaltır.

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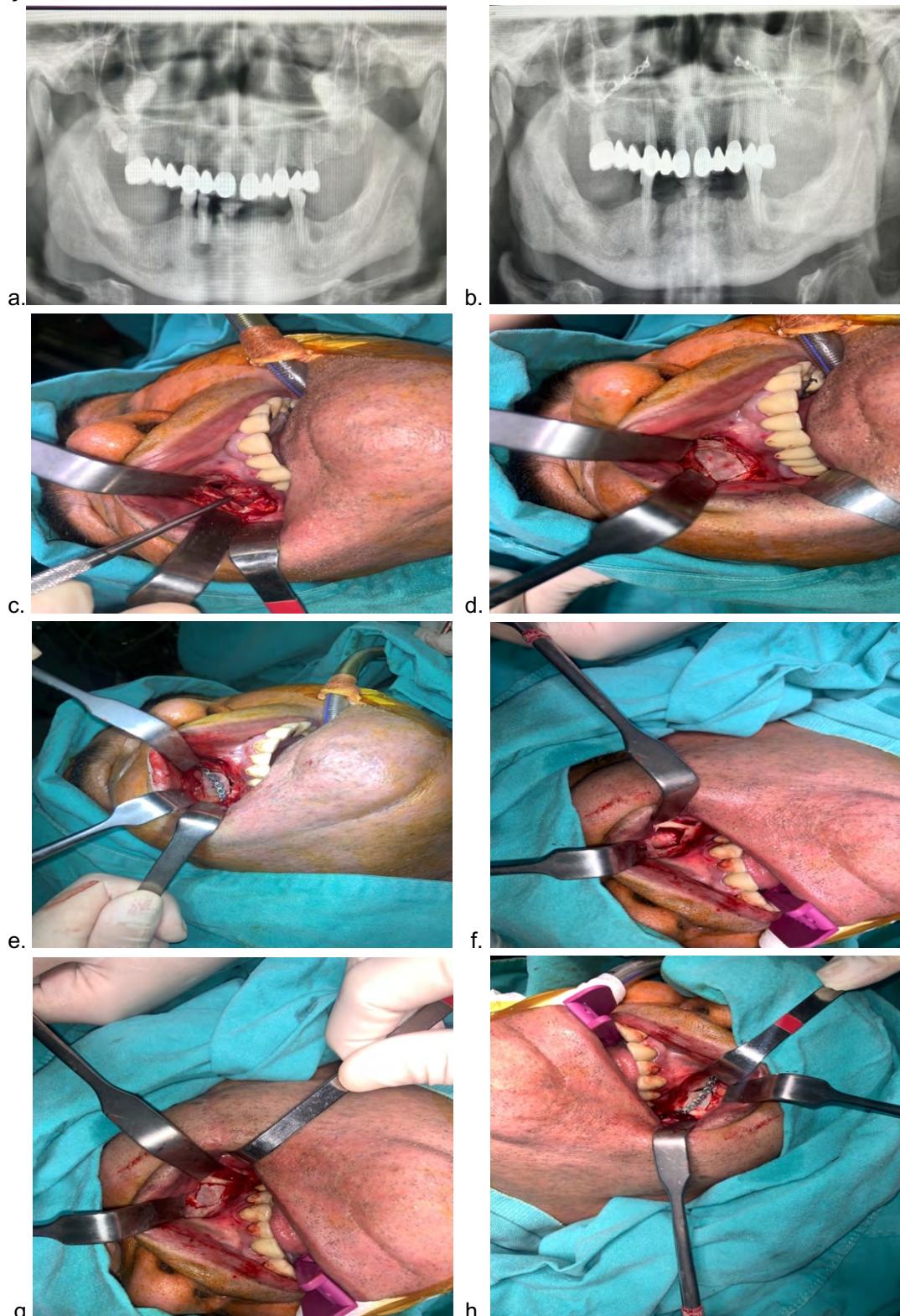
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ŞEKİL 1



Şekil 1: a) mandibula sağ 48 nolu derin gömülü dişin preoperatif OPG görüntüsü. b) postoperatif OPG görüntüsü. c,d,e) ağız içi dişin olduğu bölge, diş alındıktan sonra mandibular sinirin görünümü, kemik pencerenin reposisyonu

ŞEKİL 2



Şekil2: a) preoperatif OPG görüntüsü. b) postoperatif OPG görüntüsü. c,d,e) sağ maksilla posterior bölgede sinüs içerisindeki dişin ağız içi görünümü , kemik pencere repozisyonu, miniplak fiksasyonu. f,g,h) sol maksilla posterior bölgede sinüs içerisindeki dişin ağız içi görünümü , kemik pencere repozisyonu, miniplak fiksasyonu.

SS-025

DENTAL AUTOTRANSPLANTATION: SURGICAL PROCEDURE AND OUTCOMES BASED ON RECENT CASE REPORTS

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Abstract

Objective: The aim of this study is to evaluate the process of dental autotransplantation through the presentation of a rare case. Recent case reports were reviewed to summarize success rates and complications, and a clinical case involving the transplantation of impacted and supernumerary teeth in the mandible performed by the authors is presented.

Case Report: Five recently published autotransplantation cases were analyzed. The cases were compared in terms of donor tooth type, root development stage, surgical technique, extraoral time, splint duration, and follow-up protocol. Additionally, a 17-year-old male patient case is presented. In this case, the horizontally impacted tooth 35 was extracted, and three weeks later, a horizontally impacted supernumerary tooth in the same region was transplanted to the 35 area, while another supernumerary tooth located between teeth 44 and 45 was transplanted to the 36 area. The recipient sockets were prepared using a trephine bur, and the harvested autogenous bone grafts were used to fill gaps around the transplanted teeth. The reviewed cases showed higher success rates when donor teeth had 50–75% root formation and open apical foramina. In cases using CAD/CAM and 3D planning, surgical time was shorter and complications fewer. In the presented case, following atraumatic extraction, autogenous grafting, and two weeks of flexible splinting, the donor teeth remained vital, with no infection or mobility. However, a radiolucent area was detected around the tooth transplanted to the 36 region at the 4-month follow-up.

Conclusion: Dental autotransplantation is a biologically compatible and functional alternative to implants. Successful outcomes require proper case selection, careful planning, and three-dimensional surgical preparation.

Key words: Dental autotransplantation, impacted tooth, splint

1. Introduction

Dental autotransplantation is the surgical relocation of a patient's own tooth to another alveolar site and represents a biologically compatible treatment alternative to implants, particularly in young individuals. This approach allows preservation of the periodontal ligament, stimulation of alveolar bone, and natural tissue integration (1). Today, innovative techniques such as CBCT-based planning, 3D-printed donor tooth replicas, and surgical templates have been introduced to reduce operation time, minimize periodontal ligament damage, and improve success rates (2,3). This review aims to evaluate success rates and complications by analyzing recent case reports performed using these modern methods. Additionally, a rare clinical case involving the transplantation of impacted and supernumerary teeth in the mandible is presented.

2. Materials and Methods

In this review, five dental autotransplantation cases published within the last five years were analyzed using the PubMed and Google Scholar databases. The cases were compared in terms of donor tooth type, root development stage, surgical technique (conventional vs. 3D-guided), extraoral time, splinting duration, and follow-up protocols. In addition, a clinical case involving a 17-year-old male patient was presented. In this case, a horizontally impacted tooth 35 was extracted; three weeks later, a horizontally impacted supernumerary tooth in the 35 region was transplanted into the same site, while another supernumerary tooth located between teeth 44 and 45 was transplanted into the 36 region (Figure 1-3). Recipient sockets were prepared using a trephine bur, and the harvested autogenous bone grafts were used to fill gaps around the transplanted teeth (Figure 4). A flexible splint was applied immediately after suturing and maintained for two weeks (Figure 5-6).

3. Results

In the analyzed reports, the highest success rates were observed when donor teeth had 50–75% root development and open apical foramina. Cases utilizing 3D planning and CAD/CAM technologies showed shorter surgical durations and reduced postoperative complications (2). In the presented case, vitality was maintained following atraumatic extraction and proper socket preparation with autogenous grafting. No signs of

infection or mobility were observed during follow-up; however, a radiolucent area was detected in the 35 region on panoramic radiography (Figure 7).

4. Discussion

A review of the literature indicates that cases performed with digital planning and 3D replication demonstrate shorter surgical times, fewer complications, and improved tissue integration compared with conventional methods (2,3,4). Key factors contributing to success include atraumatic extraction and preservation of vital periodontal ligament cells (5,6). Nevertheless, certain cases have reported complications such as root resorption and ankylosis (1,7). The radiolucent area observed in the presented case highlights the importance of early detection of potential complications. To ensure long-term success, careful case selection, precise surgical execution, and long-term follow-up are essential.

5. Conclusion

Dental autotransplantation, when combined with proper case selection, accurate surgical technique, and technological support, is a highly successful and natural tooth replacement method. It provides an effective solution, particularly in young patients and cases where implant therapy is not feasible.

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7. Figures



Figure 1: Panoramic view



Figure 2: Impacted mandibular second premolar



Figure 3: Transplantation view of the impacted and supernumerary tooth



Figure 4: Graft obtained during socket preparation



Figure 5: Suturation



Figure 6: Splint



Figure 7: Postoperative panoramic view

SS-033

"EVALUATION OF THE CLINICAL EFFECTS OF VESTIBULAR INCISION MODIFICATIONS IN MINIMALLY INVASIVE SURGICALLY ASSISTED RAPID PALATAL EXPANSION (SARPE)"Ayten Öztürk^a, Yıldız Ünüvar^b, Anıl Karaman^c^aEge University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkeyayten.ozturk@ege.edu.tr^bIzmir Tinaztepe University, Vocational School of Health Services, Department of Mouth and Dental Health, Izmir, Turkeyyildiz.unuvar@tinaztepe.edu.tr^cEge University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Turkeyanil.karaman@ege.edu.tr**Abstract****Objective:**

Surgically assisted rapid palatal expansion (SARPE) is widely used to correct transverse maxillary deficiency in skeletally mature patients. Traditionally, a full-length vestibular incision has been used to access the maxillary lateral wall; however, extended incisions may increase postoperative morbidity. Recently, modified vestibular incisions have been proposed to reduce soft tissue trauma and patient discomfort. This study aimed to evaluate the clinical outcomes of SARPE performed using different vestibular incision designs.

Materials and Method:

Six adult patients with transverse maxillary deficiency underwent SARPE under local anesthesia. Bilateral lateral osteotomy and midpalatal suture osteotomy were performed in all cases, without pterygomaxillary disjunction. A tooth-borne Hyrax appliance was used. One patient underwent SARPE via a full-length vestibular incision, whereas five patients were treated using a modified vestibular incision. Expansion was initiated after a 3-day latency period at a rate of 0.25 mm twice daily until the planned expansion was achieved. Clinical and radiographic evaluations were performed to assess skeletal and dental expansion, postoperative complications, and early stability.

Results:

All patients achieved the desired transverse expansion, with a mean intermolar increase of 5–7 mm. Expansion followed a V-shaped pattern, being more pronounced at the dental arch level and less at the nasal floor. No major complications (hemorrhage, uncontrolled fractures) occurred. Patients treated with modified vestibular incisions exhibited reduced postoperative edema and discomfort compared with those treated with a full-length incision. No relapse was observed during early follow-up.

Conclusion:

Both full-length and modified vestibular incision techniques are safe and effective for SARPE performed under local anesthesia. Modified vestibular incisions may offer advantages by reducing postoperative morbidity while maintaining adequate surgical access.

Keywords: SARPE; transverse maxillary deficiency; modified vestibular incision; minimally invasive surgery; maxillary expansion.

1. Introduction

Surgically assisted rapid palatal expansion (SARPE) is a surgical orthodontic method used in the treatment of transverse maxillary deficiency in skeletally mature patients. While conventional rapid maxillary expansion (RME) performed in children and adolescents can separate the midpalatal suture, this suture is fused in adults. Therefore, sufficient skeletal expansion cannot be achieved by orthodontic forces alone. SARPE aims to achieve transverse skeletal maxillary expansion by applying distraction forces following surgical osteotomies to reduce maxillary resistance.

The fundamental principle of SARPE is to achieve controlled transverse expansion through distraction osteogenesis by weakening the resistance areas of the maxilla with osteotomies. Transverse maxillary deficiency is one of the most common dentoskeletal anomalies in adults and is characterized by posterior crossbite, narrow palatal arch, dental crowding, increased buccal corridors, and functional breathing problems (1). While separation of the midpalatal suture can be achieved by rapid maxillary expansion (RME) during growth, after skeletal maturation the ossification of the suture limits the response to orthopedic forces and mostly results in dentoalveolar tipping (2). Therefore, SARPE is widely used as a reliable and predictable treatment option for the management of transverse maxillary deficiency in adult patients (3).

2. Material and Method

In this study, surgically assisted rapid palatal expansion (SARPE) was planned for six adult patients diagnosed with transverse maxillary deficiency. All surgical procedures were performed by the same surgical team under local anesthesia. The vestibular incision design was modified according to the individual patient. Surgical access was achieved through a full-length vestibular incision in one patient and through a modified vestibular incision in five patients. The modified vestibular incision technique aimed to minimize postoperative morbidity by providing surgical access with more limited soft tissue elevation.

Bilateral lateral maxillary osteotomy and midpalatal suture osteotomy were performed in all patients using piezosurgery. Pterygomaxillary disjunction was not performed in order to avoid additional posterior resistance reduction. No complications were observed during postoperative follow-up, and healing progressed uneventfully. A tooth-borne Hyrax-type expander was used in all patients. Following a three-day latency period after surgery, activation was initiated at a rate of 0.25 mm twice daily (0.5 mm/day) and continued until the planned transverse expansion was achieved. After completion of expansion, the appliances were kept in place for approximately three months for retention. All patients were evaluated clinically at regular intervals postoperatively. In addition, pre- and postoperative clinical and radiological assessments were conducted to evaluate changes in intermolar and inter premolar distances, the presence of complications, and early stability.

3. Results

Planned transverse expansion was successfully achieved in all six patients included in the study. Clinical and radiographic evaluations revealed a mean increase in intermolar width ranging from 5 to 7 mm. The expansion pattern exhibited a characteristic V-shaped configuration, being more pronounced at the dental arch level and anteriorly compared to the posterior regions.

All procedures were completed uneventfully, and no major complications such as hemorrhage, uncontrolled fractures, or infections were observed. Patients who underwent surgery with a modified vestibular incision demonstrated lower levels of postoperative edema, soft tissue tension, and subjective discomfort compared to the patient treated with a full-length vestibular incision.

No signs of relapse were detected during the early follow-up period, and the achieved expansion remained stable. Additionally, no loosening of the expansion appliance, dental root resorption, or periodontal complications were reported in any of the patients.

4. Discussion

In our study, the modified vestibular incision approach was notable for being associated with less postoperative edema and soft tissue discomfort compared to the full-length vestibular incision. While conventional full-length vestibular incisions may increase morbidity due to the extensive soft tissue elevation required, modified approaches involving limited soft tissue dissection can shorten the surgical time and accelerate healing.

In the conventional SARPE procedure, a full-length vestibular incision is generally preferred. However, this approach has been associated with postoperative edema, paresthesia, and discomfort due to extensive soft tissue dissection. Gonzalez Lagunas et al. described a modification technique in which lateral corticotomy and midpalatal osteotomy were performed through three small vertical vestibular incisions, and reported that this approach resulted in less soft tissue trauma, less edema, and a similar degree of skeletal expansion (4).

Similarly, in a large series of 283 cases reported by Hernandez-Alfaro et al., it was emphasized that minimally invasive SARPE performed with limited vestibular incisions reduced complication rates and accelerated the healing process (5).

The impact of vestibular incision on soft tissues is also important. In a meta-analysis by Lee and Perrino (2017), it was noted that full-thickness vestibular incisions during SARPE may detach periosteal attachments and retract the upper lip musculature laterally, thereby causing thinning of the upper lip and widening of the alar base (6). This mechanism suggests that limiting the vestibular incision line could reduce not only surgical morbidity but also postoperative aesthetic changes. In our study, the observation of clearly less edema and discomfort in cases treated with a modified vestibular incision compared to the case treated with a full-length incision supports these findings in the literature. Although there are few studies directly comparing the effect of vestibular incision design on SARPE outcomes, there is evidence suggesting that less invasive approaches improve postoperative comfort (1)(7).

In addition, performing the procedures under local anesthesia provided a significant advantage in terms of patient comfort and surgical cost. Although SARPE is traditionally performed under general anesthesia, it can also be safely performed under local anesthesia, especially in selected cases with low surgical risk. This approach allows patients to mobilize more rapidly in the postoperative period and return to their daily activities earlier.

5. Conclusion

In conclusion, the findings of this study demonstrate that SARPE procedures performed under local anesthesia without pterygomaxillary disjunction and using a modified vestibular incision can provide sufficient transverse expansion in selected cases, while reducing postoperative morbidity and yielding stable results in the early period. These results are consistent with the current literature emphasizing the effectiveness of minimally invasive approaches. Larger prospective studies are needed to more robustly clarify the impact of modified vestibular incision techniques and local anesthesia applications on SARPE outcomes. These data support that less invasive vestibular incision approaches may be an effective alternative to conventional full-length incisions and may contribute to reducing the morbidity of SARPE.

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7. Figures



Figure 1. Intraoral photographs of sarpe surgery and clinical view showing increased interdental distance following Hyrax expansion

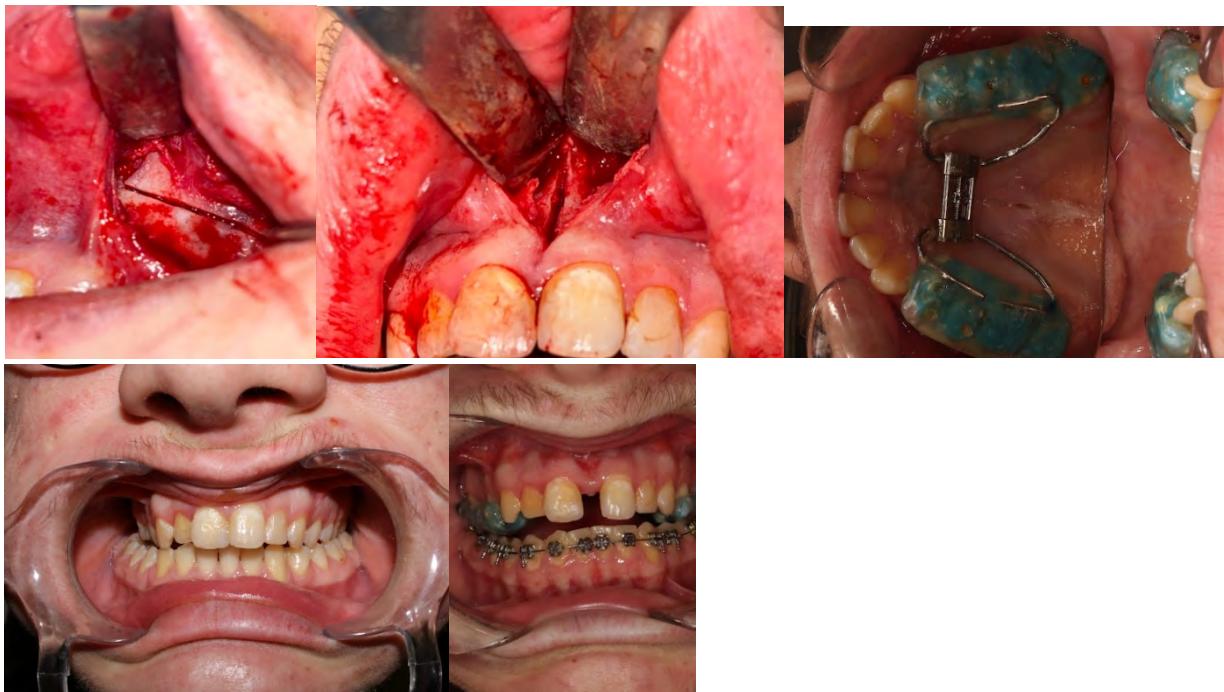


Figure 2. Intraoral photographs of sarpe surgery and clinical view showing increased interdental distance following Hyrax expansion

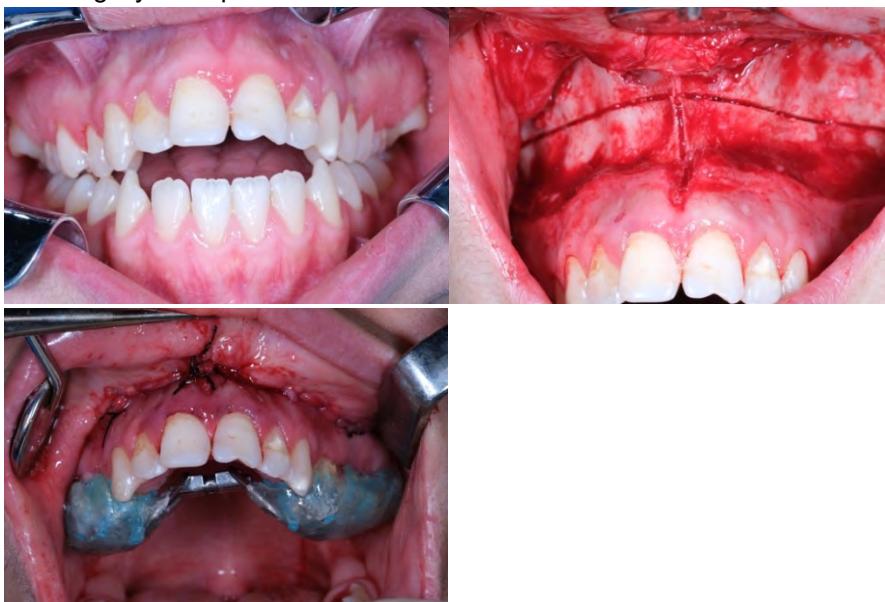


Figure 3. Intraoperative and postoperative views of a full-length vestibular incision used in SARPE.



Figure 4. operative images of surgeries performed with a minimally invasive approach

SS-048

Farklı Anatomik Boşluklara Yer Değiştiren İmplantların Cerrahi Yönetimi: Dört Olgu ve Literatür Değerlendirmesi
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GİRİŞ: Dental implant cerrahisinin önemli komplikasyonlarından biri implantların ektopik bölgelere yer değiştirmesidir ve genellikle perioperatif dönemde meydana gelir. Maksillada, azalan alveolar kemik yüksekliği implantların sinüse göç riskini artırır. Sublingual boşluğa yer değiştirme ise literatürde oldukça nadirdir.

VAKA SUNUMU: VAKA 1: Diş merkezde maksiller posterior bölgeye yerleştirilen implantın sinüse yer değiştirmesi üzerine hasta kliniğimize yönlendirilmiş, radyolojik inceleme sonrası lateral pencere yöntemiyle implant çıkarılmıştır.

VAKA 2: Yaklaşık 17 yıl önce diş merkezde sinüse yer değiştiren implantı tedaviye devam etmediği için sinüste bırakılan hasta yeniden implant uygulaması talebiyle kliniğimize başvurmuştur. Radyolojik muayenede implantın sinüs içinde olduğu görüldü. İmplant bukkal pencere yöntemiyle çıkarıldı.

VAKA 3: Mandibular posterior bölgede cerrahi sırasında fark edilmeyen lingual korteks perforasyonu sonucu implant sublingual boşluğa yer değiştirdi. Lingual flap kaldırılarak implant çıkarıldı.

VAKA 4: Kapama vidası takılırken hastanın hex anahtarını yutması üzerine, radyolojik lokalizasyon yapılarak hastanın genel cerrahiye yönlendirilmesi sağlanmış ve komplikasyonsuz şekilde gastrointestinal sistemden atılımı gözlenmiştir.

SONUÇ: Dental implantların anatomik boşluklara yer değiştirmesi, multifaktöriyel etiyolojiye sahip, nadir ancak potansiyel olarak ciddi sonuçlar doğuran bir komplikasyondur. Bu komplikasyonların önlenmesinde detaylı preoperatif değerlendirme, doğru cerrahi teknikler ve implantın primer stabilitesinin sağlanması hayatı öneme sahiptir. Implantın yer değiştirmesi durumunda, olası komplikasyonları engellemek için mümkün olan en kısa sürede cerrahi olarak çıkarılmasıdır.

Anahtar Kelimeler: Dental implant, maksiller sinüs, sublingual boşluk

Surgical Management of Implants Migrating into Different Anatomical Spaces: Four Cases and a Literature Review

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OBJECTIVE: One of the major complications of dental implant surgery is the migration of implants into ectopic sites, which usually occurs during the perioperative period. In the maxilla, decreased alveolar bone height increases the risk of implant displacement into the sinus. Migration into the sublingual space, however, is extremely rare in the literature.

CASE PRESENTATION: CASE 1: The patient was referred to our clinic due to migration of an implant, which had been placed in the posterior maxilla at an external center, into the sinus. Following radiological evaluation, the implant was removed using the lateral window approach.

CASE 2: The patient, who had an implant that migrated into the sinus approximately 17 years ago at an external center and was left untreated in the sinus, returned to our clinic requesting a new implant. Radiographic examination revealed that the implant remained within the sinus. The implant was removed using the buccal window approach.

CASE 3: During surgery in the posterior mandible, an undetected perforation of the lingual cortex resulted in implant migration into the sublingual space. The implant was removed after raising a lingual flap.

CASE 4: While placing the healing abutment, the patient accidentally swallowed the hex driver. Radiological localization was performed, and the patient was referred to general surgery. The instrument passed through the gastrointestinal tract without complications.

RESULT: Migration of dental implants into anatomical spaces is a rare but potentially serious complication with a multifactorial etiology. Detailed preoperative assessment, proper surgical techniques, and achieving primary implant stability are crucial for preventing these complications. In cases of implant migration, prompt surgical removal is recommended to prevent possible adverse outcomes.

Keywords: Dental implant, Maxillary sinus, Sublingual space

SS-055

**TEMPOROMANDİBULAR EKLEM RAHATSIZLIKLARI TEDAVİSİNDE UYGULANAN FARKLI
ARTROSENTEZ YÖNTEMLERİNİN KLINİK OLARAK DEĞERLENDİRİLMESİ : RETROSPEKTİF ÇALIŞMA**

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KTÜ Diş Hekimliği Fakültesi Ağız Diş ve Çene Cerrahisi Trabzon

Giriş: Temporomandibular düzensizlikler (TMD), toplumda sık görülen, ağrı, hareket kısıtlılığı ve eklem sesleri gibi semptomlarla seyreden, bireyin yaşam kalitesini olumsuz etkileyen rahatsızlıklardır. Tedavide temel hedef; etyolojik faktörleri ortadan kaldırarak eklemin fizyolojik fonksiyonlarını geri kazandırmaktır. Konservatif yöntemlerden fayda görülmeyen vakalarda minimal invaziv bir yaklaşım olan artrosentez ön plana çıkar. Artrosentez hem inflamatuar mediatörleri uzaklaştırarak ağrıyi azaltmayı hem de eklem hareketliliğini artırmayı amaçlar. Bu çalışmada, Wilkes evre 2-3 TME bozukluğu olan hastalarda, farklı artrosentez tekniklerinin intraoperatif parametreleri ve klinik başarıları karşılaştırılarak değerlendirilmiştir.

Gereç ve Yöntem: Bu çalışma Karadeniz Teknik Üniversitesi Diş Hekimliği Fakültesi Ağız, Diş ve Çene Cerrahisi Anabilim Dalı'nda yürütülmüştür. İki farklı artrosentez tekniğiyle tedavi edilen 50 hastanın (Grup 1: n=25, Grup 2: n=25) kayıtlı dosyaları geriye dönük olarak incelenmiştir. Birinci gruba Mun ve ark. tarafından yapılan, eğimleri birbirine bakacak, "Y" harfi şeklini oluşturacak şekilde büükülmüş, eş zamanlı ve eş merkezli yerleştirilen 22 Gauge'luk iki iğneden oluşan yöntem ile, ikinci gruba Rahal ve ark. tarafından kullanılan fabrikasyon Y-şekilli kanül ile artrosentez uygulanmıştır. Her hastaya işlem lokal anestezi altında uygulanmış olup, üst eklem boşluğu ortalama 100 ml Ringer Laktat solüsyonu ile yılanmıştır. Hastalara, artrosentez işlemini takiben 1 ml hyaluronik asit enjeksiyonu gerçekleştirilmiştir. Hastalardan elde edilen çene hareketleri (maksimum ağız açılığı, yardımeli maksimum ağız açılığı ve protrüziv hareketler), çığneme etkinliği, ağrı düzeyi (fonksiyon dışında ve fonksiyon sırasında VAS testleri ile), eklem sesleri, deviasyon/defleksyon durumu, otolojik semptomlar ve baş ağrısı kayıtları; preoperatif ve postoperatif 1. ay ile 6. ay değerleri üzerinden gruplar arası istatistiksel olarak karşılaştırılarak değerlendirilmiştir. Ayrıca gruplar arasında artrosentez işlemi sırasında kaydedilen intraoperatif parametreler de (igne giriş sayısı, işlem süresi, komplikasyon durumu ve tedavi tolerasyonu) karşılaştırılmıştır.

Bulgular: İgne giriş sayısı açısından Grup 2'de işlemler daha az girişle tamamlanmış ve istatistiksel olarak anlamlı fark saptanmıştır ($p=0,049$). İşlem süresi, komplikasyon oranları ve tedavi tolerasyonu açısından gruplar arasında anlamlı fark bulunmamıştır ($p>0,05$). Fonksiyonel ölçümlerde her iki grupta da postoperatif iyileşme izlenmiş, ancak yalnızca protrüzyon hareketinde Grup 1 lehine ($p=0,035$) ve çığneme etkinliği skorlarında Grup 2 lehine ($p=0,015$) anlamlı fark tespit edilmiştir. Semptomatik değerlendirmelerde (eklem sesi, deviasyon/defleksyon, otolojik semptomlar ve baş ağrısı) her iki grupta postoperatif dönemde belirgin düzelleme görülmüş, ancak gruplar arasında istatistiksel olarak anlamlı bir farklılık bulunmamıştır ($p>0,05$).

Sonuç: Bu çalışmada artrosentez uygulamalarında kullanılan farklı yöntemler, intraoperatif parametreler, fonksiyonel ölçümler, ağrı düzeyleri ve semptomatik iyileşme açısından karşılaştırılmıştır. Her iki yöntemin de eklem fonksiyonlarını ve semptomları iyileştirmede etkili olduğu görülmüş, ancak bazı parametrelerde gruplar lehine farklılıklar saptanmıştır. Bulgular, artrosentezin temporomandibular eklem bozuklıklarının tedavisinde güvenilir ve etkin bir yöntem olduğunu desteklemektedir.

Anahtar Kelimeler: Temporamandibular Eklem Bozuklukları, Temporamandibular Eklem Artrosentezi, TME Artrosentez modifikasyonları

SS-057

Three Condylar Fracture Cases Treated With Preauricular Approaches: A Case SeriesMuhammed Fatih Çiçek^a, Ahmet Caymaz^b, Cansu Gülcoca^c

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ABSTRACT:

OBJECTIVE: This case report presents the treatment and follow-up of condylar fractures caused by trauma.

CASE PRESENTATION: The treatment and follow-up of 3 patients without systemic diseases, who presented to the Department of Oral and Maxillofacial Surgery at Uşak University, were carried out.

Case 1: A 19-year-old male patient with a low-level medially displaced condylar neck fracture on the right side, a medially displaced condylar head fracture on the left side, and an oblique fracture in the parasympysis due to trauma, was operated on using a preauricular approach. The fracture on the right condyle and the parasympysis were fixed. The fracture on the left condyle could not be fixed. A 3-month follow-up was conducted.

Case 2: A 49-year-old male patient with a low-level medially displaced condylar neck fracture on the right side due to assault was operated on using the Alkayat-Bramley approach. A 3-month follow-up was conducted.

Case 3: A 24-year-old male patient with a low-level medially displaced condylar neck fracture on the right side due to a traffic accident was operated on using a preauricular approach. A 1-year follow-up was conducted.

IMF was applied to all patients for one month, and regular follow-ups were performed.

RESULTS: In all three patients who underwent surgery and were followed up, pre-traumatic occlusion was successfully restored. No complications such as facial nerve injury, infection, or postoperative bleeding were observed. Mouth opening was measured at 35 ± 5 mm without malocclusion.

Keywords: Condylar fracture, preauricular approach, mandibular trauma.

1. INTRODUCTION:

In maxillofacial trauma, the mandible is one of the most frequently affected facial bones, with condylar fractures accounting for approximately 25–35% of all mandibular fractures. Fractures in the condylar region can lead to various anatomical and functional complications, including poor aesthetic appearance, impaired masticatory function, occlusal disturbances, and adverse effects on the temporomandibular joint.

Several factors play a critical role in determining the appropriate treatment approach, such as the level of the fracture, degree of displacement, occlusal relationship, the patient's age, and the presence of additional fractures. Treatment modalities are generally categorized as surgical and conservative. Surgical intervention is the preferred method in cases with significant displacement and occlusal dysfunction. The primary objectives of this approach are to restore the anatomical position of the condyle, maintain functional occlusion, and prevent limitations in joint movement.

This case report presents the surgical management and postoperative follow-up of three patients with trauma-induced condylar fractures who were treated at the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Uşak University.

2. CASE REPORTS**2.1. Case 1**

A 19-year-old healthy male patient presented with temporomandibular joint (TMJ) pain and occlusal dysfunction following a traffic accident. Clinical examination and radiographic evaluation revealed three distinct fractures: a low-level, medially displaced fracture of the right condylar neck; a medially displaced fracture of the left condylar head; and an oblique fracture in the mandibular parasympysis region. A combined approach using miniplates and a reconstruction plate was planned for the patient's treatment.

To achieve ideal occlusion and apply postoperative IMF, arch bars were adapted to both the maxillary and mandibular arches using wire ligatures. A preauricular incision was used bilaterally to access the condylar fractures. The right condyle was successfully reduced with a miniplate and screws; however, the left condylar fracture was deemed unsuitable for fixation. Therefore, the fractured condylar head and small fragmented pieces were removed and debrided. A reconstruction plate was placed to ensure stable fixation of the parasymphysis fracture.

The patient was monitored for six weeks using arch bars and intermaxillary elastics. Active mouth-opening exercises were also implemented during this period. Arch bars were removed at the sixth week. The patient's initial mouth opening measured 18 mm, which increased to 40 mm at the three-month follow-up. Functional occlusion was observed to be within normal limits. No complications such as nerve injury or infection were encountered.

2.2. Case 2

A 49-year-old healthy male patient presented with TMJ pain and restricted mouth opening following an assault. Clinical examination and radiological assessment revealed a low-level, medially displaced fracture of the right condylar neck. To achieve ideal occlusion and facilitate postoperative IMF, arch bars were adapted to both the maxillary and mandibular arches using wire ligatures. Access to the condylar fracture was obtained through a right preauricular and temporal Alkayat–Bramley incision. The fracture was stabilized using a miniplate and screws.

The patient was followed for five weeks using arch bars and intermaxillary elastics. Active mouth-opening exercises were performed throughout the follow-up period. Arch bars were removed at the fifth week. The patient's initial mouth opening was 20 mm, which increased to 45 mm at the three-month follow-up. Functional mandibular movements were within normal limits. No complications such as nerve injury or infection were observed.

2.3. Case 3

A 24-year-old male patient presented with TMJ pain and restricted mouth opening following a traffic accident. Radiological evaluation revealed a low-level, medially displaced fracture of the right condylar neck. To achieve ideal occlusion and apply postoperative IMF, arch bars were adapted to both the maxillary and mandibular arches using wire ligatures. A preauricular incision was made to access the condylar fracture, and the fracture line was stabilized with a miniplate and screws.

The patient was monitored for four weeks using arch bars and intermaxillary elastics. During the follow-up period, the patient also performed active mouth-opening exercises. Arch bars were removed at the fourth week. The patient's initial mouth opening of 17 mm increased to 42 mm at the three-month follow-up. Functional mandibular movements were found to be within normal limits. No complications were observed.

3. DISCUSSION

Condylar fractures are classified among complex fractures, and their management has been a subject of debate among clinicians for many years. Conservative treatment is preferred when displacement is minimal, significant occlusal changes are absent, and patient compliance is sufficient. Surgical intervention, on the other hand, is recommended when conservative management is inadequate, such as in cases with pronounced displacement, reduction in condylar height, occlusal disturbances, or bilateral fractures [1].

The aim of surgical treatment is to restore the anatomy and function of the condyle. In the present cases, preauricular and Alkayat–Bramley incisions were employed. These approaches were preferred because they provide better surgical visibility compared to other techniques and reduce the risk of facial nerve injury.

In a study by Iizuka et al., it was reported that fixation with miniplates provided greater stability in condylar fractures than transosseous wire ligation. The authors concluded that miniplates are sufficient when fracture segments are properly aligned [2].

Takenoshita et al. recommended maintaining IMF for at least two weeks following open reduction [3].

Mezitis et al. evaluated treatment success using several parameters: restoration of occlusion, stable temporomandibular joints, absence of preauricular depression, proper bony healing, symmetric jaw and facial contours, and mouth opening greater than 40 mm [4].

In all three cases presented in this report, occlusal rehabilitation was achieved, and no complications such as nerve injury or postoperative bleeding occurred. These outcomes are consistent with the healing criteria reported in the literature [5, 6].

Surgical treatment combined with short-term IMF and mouth-opening exercises successfully prevented joint stiffness and muscle atrophy. Long-term outcomes indicate that selecting an appropriate surgical approach can yield satisfactory functional and aesthetic results.

4. CONCLUSION

These three cases demonstrate that open reduction and internal fixation is a safe and effective method in the surgical management of condylar fractures. All patients achieved occlusal rehabilitation, ideal mouth opening, and satisfactory chewing and speech functions. None of the patients experienced asymmetry or neurosensory deficits. These findings suggest that early mobilization has a positive impact on mouth opening and masticatory function. Selecting an appropriate surgical approach and the surgeon's operative proficiency are key factors influencing treatment success.

Long-term follow-up evaluations are essential for improving future treatment protocols and establishing more refined management standards.

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SS-058

KONDİLEKTOMİ SONRASI KAS EĞİTİMİ VE OKLÜZYONUN KORUNMASI

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ÖZET

Amaç

Bu olgu sunumunun amacı, unilateral kondilektomi sonrası eklem protezi kullanılmadan yalnızca ortodontik elastikler ve intermaksiller fiksasyon ile tedavi edilen iki hastayı sunmak ve klinik sonuçlarını değerlendirmektir.

Olgu Sunumu

İlk olgu, trafik kazası sonrası mandibula kırığı nedeniyle dış merkezde opere edilen 17 yaşındaki erkek hastadır. Mandibula korpusu plak ve vidalarla tespit edilmiş, ancak kondildeki deplase kırığa müdahale edilmemiştir. Kliniğimizde yapılan değerlendirme sonrası kondilde rezorpsiyon saptanmış, kondilektomi uygulanmış ve intermaksiller fiksasyon vidaları yerleştirilmiştir. Ortodontik elastiklerle kas eğitimi yapılarak doğru kapanış yönlendirilmiştir. İkinci olgu, sol temporomandibular eklem bölgesinde travmatik kemik kisti tanısı alan 20 yaşındaki kadın hastadır. Kondil fragmanları eksize edilmiş, bölge kürete edilmiştir. Kontralateral intermaksiller fiksasyon vidalarına elastikler uygulanarak kas eğitimi ile oklüzyon korunmuştur. Operasyonda periost korunduğu için ilgili bölgede yeni kemik oluşumu gözlemlenmiştir. Her iki olgunun takip sürecinde semptomsuz seyir yanı sıra fonksiyonel ve estetik açıdan tatmin edici sonuçlar elde edilmiştir.

Sonuç

Tek taraflı kondilektomi sonrası eklem protezi kullanılmadan arch bar veya intermaksiller fiksasyon vidaları ile elastik destekli kas eğitiminin sağlanabileceği ve oklüzyonun korunabileceği gösterilmiştir.

Anahtar Kelimeler

İtermaksiller fiksasyon; Kas eğitimi; Kondilektomi; Temporomandibular eklem

ABSTRACT

Objective

The aim of this report is to present two unilateral condylectomy cases managed without prosthetic replacement, using only intermaxillary fixation and orthodontic elastics, and to evaluate their clinical outcomes.

Case Presentation

The first case involved a 17-year-old male patient who had undergone surgery at an external center due to a mandibular fracture following a traffic accident. The mandibular corpus had been fixed with plates and screws; however, the displaced condylar fracture had not been addressed. Upon evaluation at our clinic, resorption of the condyle was detected. A condylectomy was performed, and intermaxillary fixation screws were placed.

Proper occlusion was guided through muscle training using orthodontic elastics. The second case was a 20-year-old female patient diagnosed with a traumatic bone cyst in the left temporomandibular joint region. The condylar fragments were excised, and the area was curetted. Elastics were applied to the contralateral intermaxillary fixation screws, and occlusion was maintained through muscle training. Since the periosteum was preserved during the operation, new bone formation was observed in the corresponding area. Both patients remained asymptomatic during follow-up, and functionally and aesthetically satisfactory outcomes were achieved.

Conclusion

These two cases demonstrate that unilateral condylectomy can be successfully managed without prosthetic replacement, using arch bars or intermaxillary fixation screws in combination with elastics to provide muscle training and preserve occlusion.

Keywords

Condylectomy; Intermaxillary fixation; Muscle training; Temporomandibular joint

1. GİRİŞ

Temporomandibular eklem (TME) cerrahisinde kondilektomi genellikle rekonstrüktif cerrahi veya eklem protezi ile tamamlanmaktadır (Mercuri, 2012; Wolford, 2015). Ancak bazı olgularda daha basit yöntemlerle fonksiyon korunabilmektedir. Literatürde kondilektomi sonrası protezsiz takip edilen olgularda tatmin edici sonuçlar

bildirilmektedir (Kim ve ark., 2015; Filho ve ark., 2020). Bu çalışmada, protez uygulanmadan yalnızca intermaksiller fiksasyon kullanılarak yönetilen iki tek taraflı kondilektomi olgusu sunulmaktadır.

2. OLGU SUNUMLARI

2.1 Olgu 1

17 yaşında, sistemik olarak sağlıklı erkek hasta trafik kazası sonrası mandibula kırığı nedeniyle dış merkezde opere edilmiştir. Mandibula korpusundaki kırık; plak ve vidalarla tespit edilmiş, ancak kondildeki deplase kırıga müdahale edilmemiştir. Kliniğimizde yapılan değerlendirme sonrası arch bar çıkarılmış, oral hijyen ve konfor sağlandıktan sonra genel anestezi altında kondildeki rezorpsiyondan dolayı RIF yapılamayacak durumda olduğu ve remodel olmaya başladığı için kondilektomi uygulanmıştır ve uzun dönem stabilizasyon için intermaksiller fiksasyon vidaları yerleştirilmiş ve elastiklerle tedaviye devam edilmiştir. Postoperatif takiplerde hastada ağrı, ağız açıklığında kısıtlılık veya fonksiyonel problem saptanmamış, estetik açıdan da sorun görülmemiştir (Şekil 1).

2.2 Olgu 2

20 yaşında, sistemik olarak sağlıklı kadın hasta Eylül 2023'te sol tme bölgesinde şişlik, ağız açımda kısıtlılık şikayetiyle kliniğimize başvurmuştur. Alınan insizyonel biyopsi ile travmatik kemik kisti tanısı konulan hastada kondil bölgesinde kemik dokusu bulunmamış, kondile ait fragmanlar eksize edilmiş ve bölge kürete edilmiştir. Kontralateral tarafa yerleştirilen intermaksiller fiksasyon vidalarına ortodontik elastikler takılarak kapanış elde edilmiştir. Periost korunduğu için operasyon bölgesinde yeni kemik oluşumu gözlemlenmiştir. İki yıllık takip süresinde hastada ağrı, fonksiyonel problem, ağız açıklığında kısıtlılık veya estetik sorun izlenmemiştir. Takipleri devam etmektedir. (Şekil 2).

3. TARTIŞMA

Kondilektomi sonrası standart yaklaşım genellikle hasta yaşına bağlı olarak protez veya kostokondral greft uygulanmasıdır (Mercuri, 2012; Wolford, 2015). Bununla birlikte, kondilektomi sonrası herhangi bir rekonstrüksiyon veya eklem protezi kullanılmayan olguların literatürde bildirildiği ve başarılı sonuçlar elde edildiği görülmektedir (Kim ve ark., 2015; Filho ve ark., 2020). Sfondrini ve ark. (2024) düşük kondilektomi sonrası yalnızca elastiklerle fonksiyonel tedavi uygulanan bir olguda başarılı sonuç rapor etmiş, Nelke ve ark. (2023) ise intermaksiller fiksasyon ve elastiklerin kapanış stabilitesinde önemli rol oynadığını vurgulamıştır. Sunulan olgularda protez kullanılmadan yalnızca ortodontik elastikler ve intermaksiller fiksasyon ile fonksiyonel ve estetik açıdan tatmin edici sonuçlar elde edilmiştir. Bu yaklaşımın avantajları arasında operasyon süresinin kısa olması, maliyetin düşük olması ve protez komplikasyonlarından kaçınılması yer almaktadır (Kim ve ark., 2015; Sfondrini ve ark., 2024). Ancak uzun dönem stabilitenin belirsizliği ve fonksiyonel/estetik sorunların ortaya çıkma olasılığı dezavantaj olarak değerlendirilmelidir (Wolford, 2015; Nelke ve ark., 2023). Bu nedenle uzun süreli takip önemlidir.

4. SONUÇ

Tek taraflı kondilektomi sonrası protez uygulanmadan yalnızca intermaksiller fiksasyon yöntemleri ile stabilizasyon sağlanabileceğinin, sunulan iki olguda da semptomsuz seyir, normal fonksiyon ve estetik açıdan tatmin edici sonuçlar elde edildiği görülmüştür. Bu yöntem, seçilmiş olgularda alternatif bir tedavi seçenekleri olarak değerlendirilebilir.

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RESİMLER



Şekil 1. Olgu 1'in postoperatif 2. ayındaki intraoral görünümü.



Şekil 2. Olgu 2'nin postoperatif 1. yılındaki intraoral görünümü.

SS-060

SEMAGLUTIDE (OZEMPIC) AND DENTAL FINDINGS: EMERGING CHALLENGES FOR ORAL AND MAXILLOFACIAL SURGEONSGülce Ecem Doğancıla^a, Sabri Cemil İşler^b, Abdullah Tolga Şitilci^c, Mehmet Ali Erdem^d

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Objective: Semaglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, is widely prescribed for type 2 diabetes and obesity. While its systemic metabolic effects are well established, oral and dental manifestations have only recently been recognized. This study aims to summarize reported dental findings associated with semaglutide use and to emphasize potential clinical challenges for oral surgeons.

Methods: A review of case reports, clinical observations, and experimental studies was performed to evaluate oral complications related to semaglutide therapy.

Results: The most frequently reported manifestation is xerostomia, which increases the risk of dental caries, mucosal discomfort, and opportunistic infections. Dysgeusia and dental erosion associated with nausea and vomiting are also observed. Experimental studies suggest that GLP-1 receptor agonists may modulate inflammation and bone metabolism. Correspondingly semaglutide use may be associated with osteonecrosis following dental implant surgery. Conversely, improved glycemic control provided by semaglutide may indirectly support periodontal health.

Conclusion: Semaglutide use introduces new challenges for oral surgeons. Comprehensive medical history assessment, close postoperative follow-up, and multidisciplinary management are recommended to optimize patient outcomes. Further large-scale studies are needed to clarify the mechanisms and clinical significance of these dental findings.

Keywords: implant, osteonecrosis, semaglutide

1. Introduction

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs), particularly semaglutide, have gained remarkable popularity in the management of type 2 diabetes and obesity due to their strong metabolic efficacy and substantial weight reduction outcomes. As the number of patients receiving semaglutide increases, reports of head, neck, oral, and dental adverse effects have also become more frequent. Although the systemic actions of GLP-1 RAs are well established, their potential impact on the oral cavity, peri-implant tissues, maxillofacial structures, and postoperative healing remains insufficiently understood. Recent pharmacovigilance analyses, case reports, and observational studies have identified xerostomia, dysgeusia and mucosal discomfort as emerging adverse events associated with semaglutide use. Moreover, otolaryngologic and ophthalmologic manifestations such as eustachian tube dysfunction (ETD), tinnitus, dizziness, and non-arteritic anterior ischemic optic neuropathy (NAION) further illustrate the broad distribution of GLP-1 receptors in the craniofacial region. (1-4)

For oral and maxillofacial surgeons, these findings raise important concerns regarding surgical healing, implant success, tissue integrity, and perioperative risk. Understanding the complex biological interactions between GLP-1 signaling, metabolic shifts, rapid weight loss, and oral physiology is essential for optimizing patient management.

2. Material and Methods

This study is a narrative review synthesizing the current literature on semaglutide-associated oral, dental, and craniofacial effects. A targeted search of PubMed and Scopus databases was performed using the keywords: "semaglutide," "GLP-1 receptor agonist," "oral adverse events," "xerostomia," "dysgeusia," "osteonecrosis," "bone metabolism," and "dental implant." Additionally, recently published FAERS-based pharmacovigilance analyses and relevant systematic reviews in otolaryngology, dermatology, ophthalmology, endocrinology, and oral medicine were included. Studies were selected based on relevance to the oral cavity, craniofacial region, postoperative healing, and implant-related outcomes. Data were synthesized descriptively.

3. Results

3.1. Xerostomia and hyposalivation

Xerostomia is the most frequently reported oral adverse effect of semaglutide. A case series published in *Medicine* demonstrated that semaglutide users experienced markedly reduced salivary flow, leading to oral burning, mucosal dryness, and difficulty with mastication. Hyposalivation increases susceptibility to dental caries, candidal infections, traumatic ulcerations, and can negatively influence soft tissue healing following oral surgery. (2, 5)

3.2. Dysgeusia, nausea–vomiting, and dental erosion

GLP-1 RAs are known to cause dysgeusia, altered taste perception, nausea, and vomiting. Recurrent vomiting and gastric acid exposure may accelerate dental erosion and dentin hypersensitivity. FAERS analyses have identified dysgeusia as a significant signal associated with semaglutide and other GLP-1 RAs. (2)

3.3. Halitosis and microbial alterations

Recent clinical observations indicate that semaglutide may contribute to halitosis through alterations in gastrointestinal motility and gut microbiota, which increase the production of volatile sulfur compounds. Combined with xerostomia, this may exacerbate oral malodor complaints. (2, 6)

3.4. “Ozempic Face”: rapid weight-loss–related soft tissue depletion

Dermatologic literature describes “Ozempic face,” characterized by midfacial volume loss, buccal fat atrophy, temporal hollowing, and a prematurely aged appearance following rapid weight reduction. For maxillofacial surgeons, decreased soft tissue support may influence facial aesthetic assessment, orthognathic surgery planning, and postoperative expectations. (7)

3.5. Otologic adverse events: eustachian tube dysfunction

Multiple FAERS-based studies, including those published in *The Laryngoscope and Otology & Neurotology*, report increased risk of ETD, tinnitus, ear fullness, and dizziness among GLP-1 RA users. These findings may have implications for patients undergoing procedures involving changes in maxillofacial pressure dynamics or sedation. (4)

3.6. Ocular adverse events: NAION

A large Danish cohort study revealed that once-weekly semaglutide doubles the risk of developing NAION, a vision-threatening complication. Although this is not an oral condition, its relationship to craniofacial vasculature is clinically relevant, particularly when planning surgeries that may temporarily alter ocular perfusion. (3)

3.7. Bone metabolism and fracture risk

The impact of semaglutide on bone metabolism remains debated. Certain studies suggest alterations in bone turnover markers, while others report decreased bone density secondary to rapid weight loss rather than a direct pharmacologic effect. Although fracture risk data are inconclusive, reduced mechanical loading during weight loss may compromise bone quality, potentially affecting implant osseointegration. (8, 9)

3.8. Periodontal and peri-implant tissue responses

Current evidence indicates that improved glycemic control achieved with semaglutide may positively influence periodontal inflammation. However, FAERS reports also include cases of implant failure, peri-implant infection, and possible osteonecrosis. The underlying mechanisms could involve altered inflammatory responses, mucosal barrier compromise, or metabolic shifts affecting bone remodeling. (10)

4. Discussion

The variety of oral, dental, otologic, and ocular effects associated with semaglutide underscores the widespread influence of GLP-1 receptor activity in the head and neck region. For oral surgeons, xerostomia and hyposalivation are especially relevant as they predispose patients to mucosal fragility, increased caries risk, impaired oral hygiene, and delayed postoperative recovery.

Although current evidence directly linking semaglutide to implant failure or osteonecrosis remains limited, several published case reports and experimental studies suggest that GLP-1 receptor agonists may influence bone remodeling, soft tissue integrity, and postoperative healing. Rapid weight loss and associated metabolic changes may indirectly affect bone turnover, while xerostomia and mucosal fragility can compromise peri-implant soft tissue health. For these reasons, individualized risk assessment, close postoperative follow-up, early radiographic evaluation, and timely management of inflammatory complications are recommended when treating patients receiving semaglutide therapy. (8, 9)

Otologic and ocular adverse effects further highlight the systemic implications of semaglutide therapy. In particular, ETD and NAION, although not directly dental, may influence anesthetic considerations and perioperative risk stratification during maxillofacial interventions. (2-4)

Conversely, semaglutide's improvement in glycemic control may offer periodontal benefits, emphasizing the need for individualized evaluation rather than a uniformly negative interpretation of GLP-1 RA therapy.

Multidisciplinary collaboration with endocrinologists, oral medicine specialists, and otolaryngologists is essential for optimizing outcomes. (10, 11)

5. Conclusion

Semaglutide is associated with a growing spectrum of oral and craniofacial side effects, including xerostomia, dysgeusia, dental erosion, peri-implant complications, ETD, and rare ocular events such as NAION. These findings introduce new clinical challenges for oral and maxillofacial surgeons, particularly in surgical planning, implant therapy, and postoperative management. Comprehensive medical history, detailed oral examination, and close follow-up are critical when treating patients using GLP-1 RAs. Further large-scale clinical studies are needed to clarify causal mechanisms and determine evidence-based guidelines for perioperative care in this expanding patient population.

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SS-065

TECHNIQUES FOR THE RECONSTRUCTION OF SEVERELY ATROPHIC MAXILLA: A CASE SERIES

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Abstract

Objective: This study presents various protocols applied in the surgical rehabilitation of severely atrophic maxilla. Patient-specific subperiosteal and zygomatic implant applications, implants placed following guided bone regeneration (GBR) and the All-on-Four concept were evaluated together with our clinical protocols and associated complications in line with current literature.

Case: Four cases of severely atrophic maxilla, in which conventional implant placement was not feasible, were treated at the Department of Oral and Maxillofacial Surgery, Istanbul Beykent University Faculty of Dentistry, between 2023 and 2025. Each case was managed using different surgical protocols tailored to anatomical conditions and clinical requirements.

Conclusion: All applied protocols were successful in establishing a suitable foundation for functional prosthetic rehabilitation. Nevertheless, each technique carries its own biological and mechanical complication risks. The majority of these complications were effectively managed through early diagnosis, regular follow-up, and maintenance of oral hygiene. In the rehabilitation of severely atrophic maxilla, patient-specific planning, accurate assessment of anatomical limitations and a multidisciplinary approach are critical determinants of long-term success.

Keywords: Guided Bone Regeneration, Subperiosteal implant, Zygomatic implant

1. Introduction

Severe atrophy of the maxilla is characterized by significant vertical and horizontal bone loss. Maxillary atrophy is a progressive, multifactorial process influenced by a combination of local and systemic factors. Key contributors include physiological resorption of the alveolar ridge, maxillary sinus pneumatization, osteoporosis, and periodontal disease (1). The Cawood– Howell classification system is commonly used to evaluate alveolar ridge morphology and to grade the extent of resorption. Severe atrophic maxilla correspond to Class V or VI within this classification (2). In the four cases presented in this series, conventional prosthetic rehabilitation was not feasible due to anatomical and biomechanical limitations, necessitating the use of surgical reconstruction techniques.

2. Case Reports

Four cases of severely atrophic maxilla, in which conventional implant placement was not feasible, were treated at the Department of Oral and Maxillofacial Surgery, Istanbul Beykent University Faculty of Dentistry between 2023 and 2025. All patients underwent comprehensive preoperative assessment using panoramic radiography and cone-beam computed tomography (CBCT). The surgical approach was individually planned based on the available bone volume and anatomical limitations. Additionally, patient expectations, general health status, and financial considerations were incorporated into the decision-making process.

Case 1: A 60-year-old male patient, ASA 2, presented with severe vertical and horizontal maxillary bone loss accompanied by advanced sinus pneumatization. Due to insufficient anterior vertical bone, the All-on-Four protocol was deemed unsuitable, and guided bone regeneration (GBR) was not chosen because the patient requested rapid prosthetic rehabilitation. Consequently, a patient-specific subperiosteal implant was placed under general anesthesia, and prosthetic loading was performed one month postoperatively. At the two-year follow-up, implant survival was successful. However, the patient experienced two episodes of soft tissue infection during periods of inadequate oral hygiene. Both episodes were effectively managed with medical therapy (875 mg amoxicillin + 125 mg clavulanic acid and chlorhexidine mouth rinse) and reinforced oral hygiene motivation.

Case 2: A 47-year-old male patient, ASA 3, with a history of head trauma due to a fall and diagnosed with intellectual disability, was under psychiatric follow-up and taking antiepileptic (Valproic Acid, Depalept®), antipsychotic (Zuclopentixol, Clopixol®), and anticholinergic (Trihexyphenidyl, Sormodren®) medications. In accordance with the family's request, full-mouth rehabilitation was planned to restore masticatory function. Due to marked sinus pneumatization and an anteriorly extending sinus wall, sinus lifting and the All-on-Four approach were deemed unfeasible. Additionally, anticipated difficulties in maintaining oral hygiene related to the patient's intellectual disability predicted a poor prognosis for subperiosteal implants. Therefore, two bilateral zygomatic implants were placed in the posterior maxilla, and four dental implants were placed in the anterior region. At the one-year follow-up, no biological or mechanical complications were observed.

Case 3: A 52-year-old female patient, ASA 1, presented with both vertical and horizontal bone defects in the anterior maxilla. Considering the presence of posterior teeth and the patient's financial situation, guided bone regeneration (GBR) was performed using PTFE membranes and graft materials. During surgery, the flap was closed primarily with Pegelak® (polyglyactin) sutures; however, flap dehiscence was observed in the first postoperative month without infection. The patient's oral hygiene was reinforced, and close follow-up was maintained. The PTFE membrane was preserved and the exposed areas were trimmed to allow proper bone regeneration. At six months, the PTFE membrane was removed, and dental implants were placed at nine months. The patient continues to be followed regularly.

Case 4: A 52-year-old female patient, ASA 2, presented with vertical bone loss in the maxilla. Considering the patient's expectations for rapid prosthetic rehabilitation and low cost, the All-on-Four protocol was applied. A permanent prosthesis was placed after a short period. At the six- month follow-up, no inflammation or soft tissue complications were observed around the implants and the patient maintained normal masticatory function.

3. Discussion

Rehabilitation of the severely atrophic maxilla requires surgical approaches beyond conventional implant treatments due to significant bone loss and biomechanical limitations. Graft- free solutions, particularly zygomatic and subperiosteal implants, reduce surgical morbidity and shorten treatment time (3). Survival rates for subperiosteal implants range from 90% to 94%, and patient-specific three-dimensional design along with primary stability allows for early prosthetic

loading. However, soft tissue complications are higher compared to zygomatic implants, occurring in approximately 10%–15% of cases (4).

Zygomatic implants provide high long-term survival in patients with large sinus volumes and a need for posterior support. Prosthetic success rates range from 95% to 97%, and complications usually occur within the first year. Risks such as sinusitis (2%–5%) and soft tissue irritation (3%–7%) are important considerations in clinical decision-making (5).

Guided bone regeneration (GBR) restores bone volume and directs osteogenic healing by preventing soft tissue invasion. It shows high predictability for both horizontal and vertical bone gain (6). PTFE membranes are effective barriers but may cause complications such as early exposure (20%–30%), infection, and flap dehiscence. Small exposures (≤ 3 mm) can be managed with proper oral hygiene and local treatment, whereas larger exposures often require membrane removal (7).

The All-on-Four protocol offers rapid prosthetic rehabilitation and cost advantages however, peri-implant mucositis (6%–8%), peri-implantitis (3%–5%), and marginal bone loss (1.18 mm at 5 years) have been reported (8). When comparing full-arch prostheses supported by four versus six implants, the five-year survival rates are similar (over 95%), and risk factors should guide the choice of implant piece (9).

4. Conclusion

Anatomy, available bone volume and patient expectations are key factors in selecting the appropriate method for reconstructing a severely atrophic maxilla. While all techniques can achieve successful outcomes under proper indications, case-specific evaluation and surgical experience play a critical role in treatment success. Each technique carries inherent biological and mechanical complication risks; however, most of these complications can be effectively managed through early detection, regular follow-up and maintenance of oral hygiene.

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6. Figures

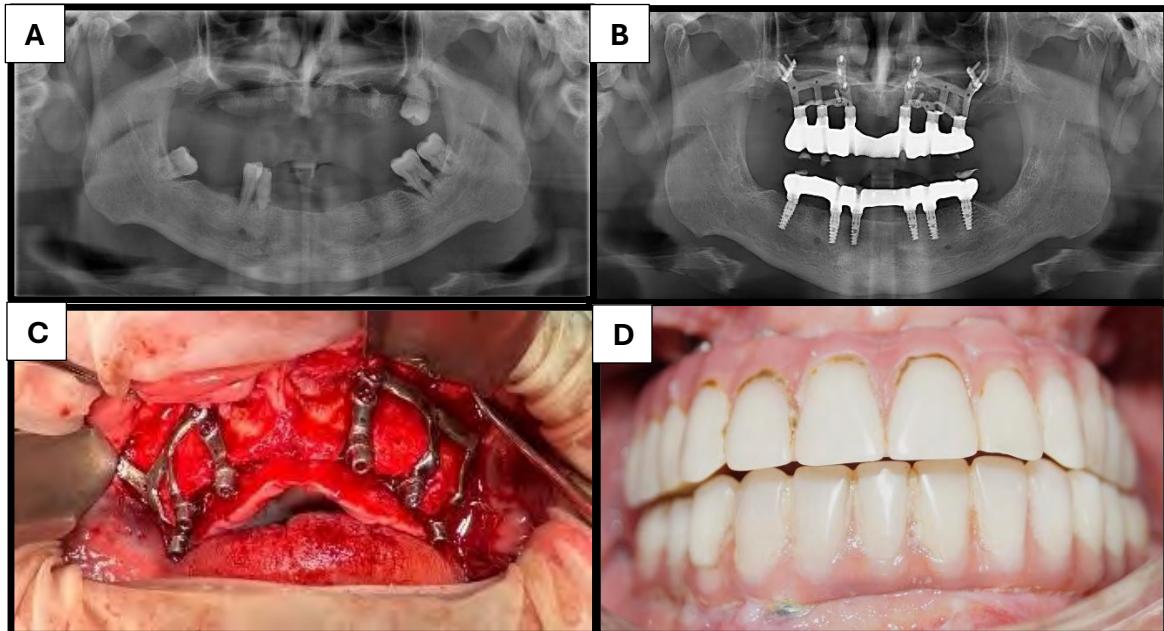


Figure 1: A: Preoperative radiographic view, B: Postoperative radiographic view C: Intraoperative view, D: Postoperative clinical view of a subperiosteal implant

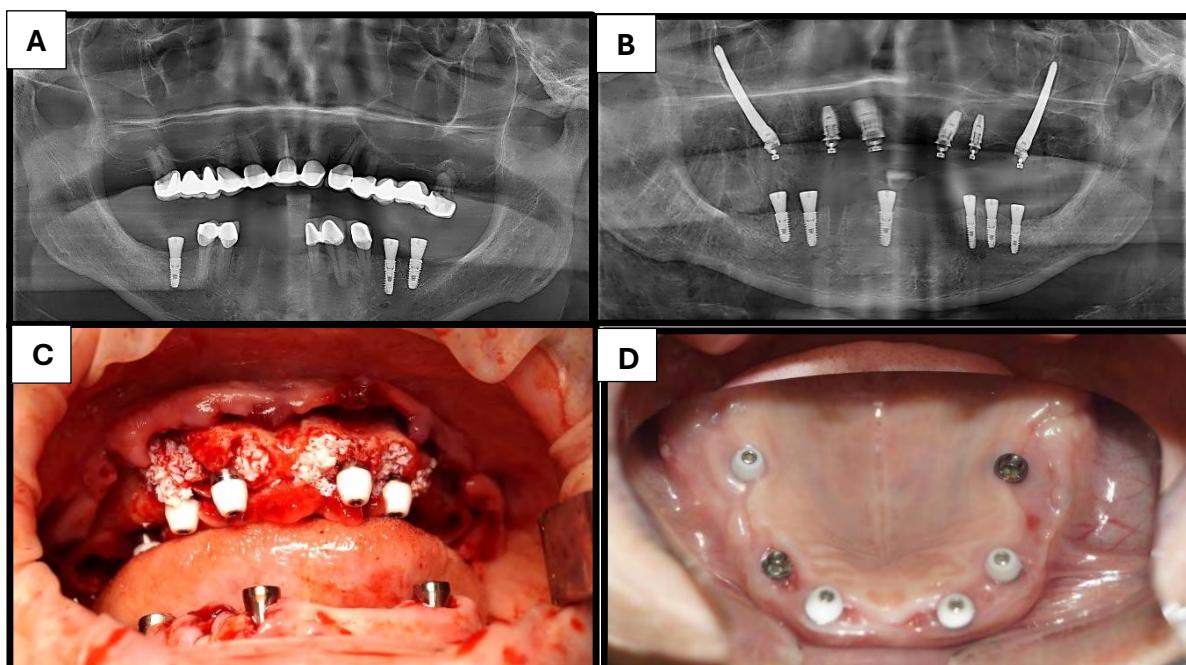


Figure 2: A: Preoperative radiographic view, B: Postoperative radiographic view C: Intraoperative view, D: Postoperative clinical view

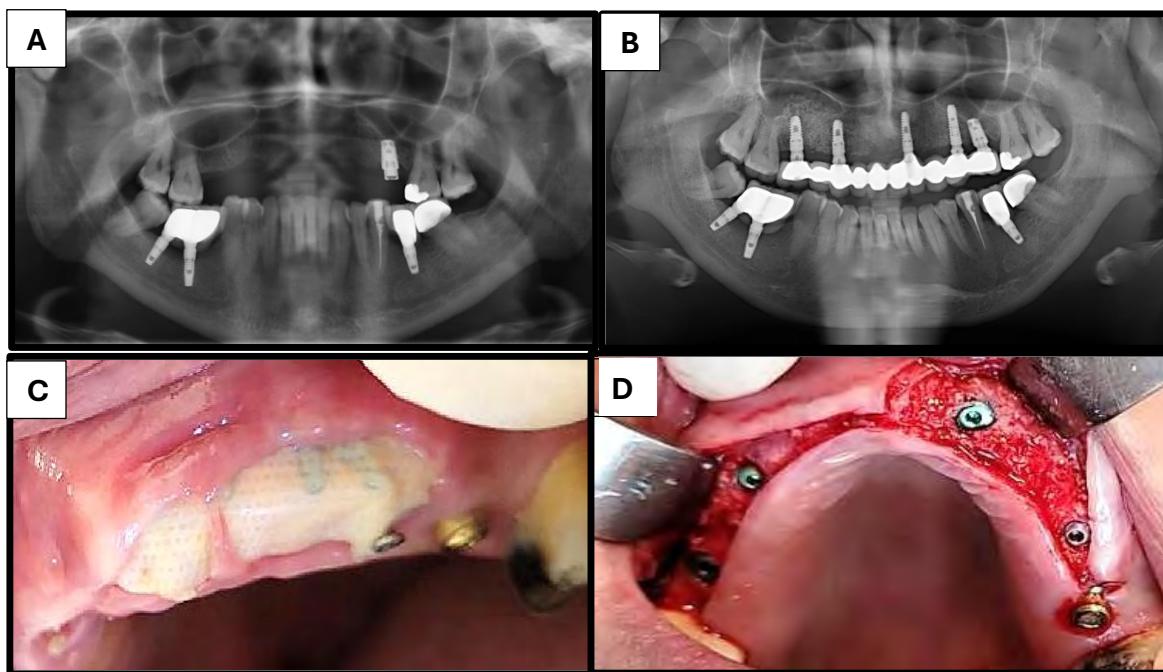


Figure 3: A: Preoperative radiographic view, B: Postoperative radiographic view C:PTFE membrane exposure occurring during in the first postoperative month of GBR treatment, D: The dental implants were placed at the ninth month.

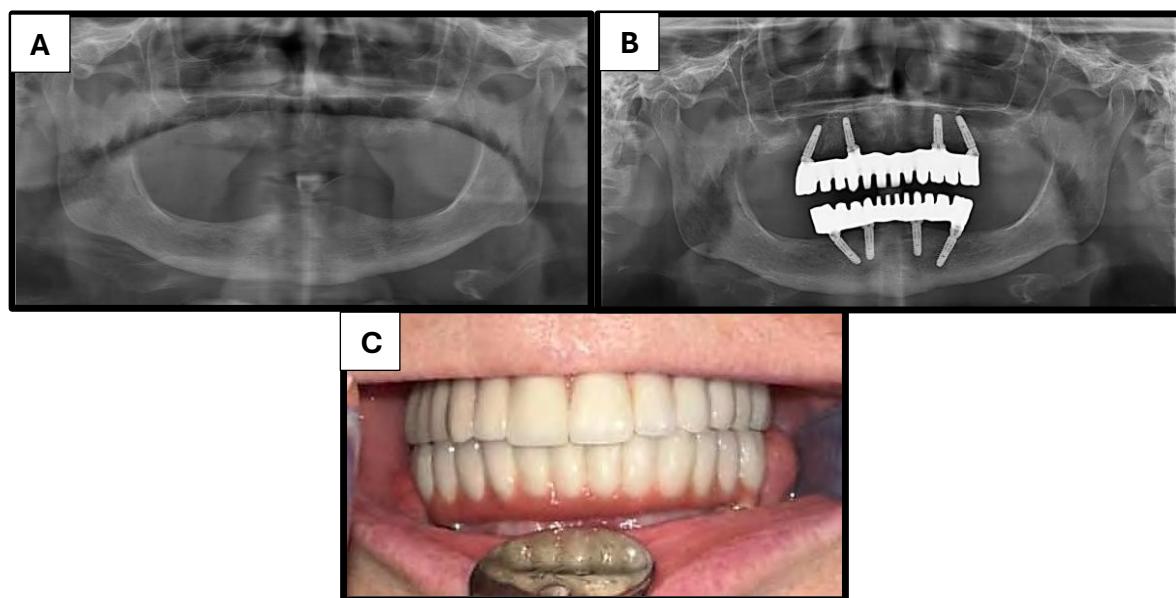


Figure 4: A: Preoperative radiographic view, B: Postoperative radiographic view C: Postoperative clinical view

SS-067

MAXILLOFACIAL RECONSTRUCTION WITH PATIENT-SPECIFIC MESH SYSTEMS: A CASE SERIES FROM PLANNING TO SURGERY

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Abstract

Objectives: Patient-specific mesh systems produced using three-dimensional (3D) virtual planning and computer-aided design have been shown to enhance surgical accuracy in maxillofacial reconstruction, reduce intraoperative complication risk and provide more predictable clinical outcomes. These technologies particularly optimize surgical planning in complex bone defects, offering patient-specific solutions. Custom design facilitates adaptation during bone augmentation and guided reconstruction procedures, supporting both hard and soft tissue healing. Recent studies have demonstrated that this approach shortens operation time compared to conventional reconstruction methods and creates sufficient bone volume for implant rehabilitation.

Case report: This case series presents the clinical application of patient-specific mesh systems in seven jaw quadrants across three patients. Customized meshes were designed for each patient based on their individual anatomical requirements using virtual surgical planning and computer-aided design. The meshes were applied intraoperatively to facilitate guided bone augmentation. Postoperative evaluations included assessment of hard and soft tissue healing, oral opening, and the adequacy of bone reconstruction for subsequent implant placement. Mesh exposure was observed in two patients; in one case, healing was achieved with close follow-up, whereas in the other, persistent non-healing necessitated mesh removal due to infection risk. Overall, radiographic and clinical assessments confirmed sufficient bone volume in the reconstructed areas, enabling successful implant rehabilitation.

Conclusion: The use of patient-specific mesh systems in maxillofacial reconstruction demonstrates predictable clinical outcomes with satisfactory hard and soft tissue healing. Customized design and adaptation enhanced surgical accuracy, reduced operative time, and promoted stable bone regeneration suitable for implant rehabilitation. This technique remains a reliable option in complex reconstructive cases.

Keywords: Bone augmentation, case series, maxillofacial reconstruction, patient-specific mesh, virtual surgical planning
1. Introduction

Reconstruction of bone defects in the maxillofacial region represents one of the most complex and controversial issues in oral and maxillofacial surgery (1). These defects may arise from various causes such as trauma, tumor resections, cystic lesions, periodontal disease, and severe atrophy (2). Since they lead to functional and aesthetic impairments, their repair directly affects patients' quality of life. Although autologous bone grafts are still considered the gold standard for reconstruction (3), donor site morbidity, the limited availability of graft material, and high resorption rates restrict clinical success (4). Therefore, autografts are often combined with allografts, xenografts, or synthetic materials. However, the inability of graft materials to provide sufficient stabilization on their own (5) has highlighted the need for barrier systems that offer mechanical support. Conventional titanium meshes are effective tools for graft stabilization in large defects. Nevertheless, intraoperative adaptation problems, soft tissue irritation caused by sharp edges, prolonged surgical time, and high complication rates limit their clinical use (6,7). In recent years, patient-specific titanium mesh systems manufactured with CAD/CAM technology have been developed to overcome these drawbacks. Designed based on the patient's three-dimensional tomographic data, these systems precisely match the defect anatomy, thereby facilitating graft stabilization, reducing surgical time, and providing more predictable outcomes. However, the literature emphasizes that the most common complications associated with patient-specific meshes are soft tissue dehiscence and infection (8). The incidence of these complications has been reported to range between 17.9% and 34.4% (9). Moreover, factors such as the type of graft used, the applied membrane, PRF support, and the number and positioning of fixation screws are decisive for treatment success (10,11). This article presents three cases of maxillofacial reconstruction using patient-specific mesh systems and discusses the outcomes in light of current literature.

Patient Evaluation

The first step in applying patient-specific mesh systems is a comprehensive evaluation of the patient. Clinical examination begins with a detailed analysis of the defect's size, location, and soft tissue conditions. The patient's systemic

condition, previous surgical history, and potential risk of complications must also be taken into consideration. This stage is critical for selecting appropriate candidates and tailoring the treatment plan.

Acquisition of Tomographic Data

Following patient evaluation, cone-beam computed tomography (CBCT) images, which form the basis of three-dimensional planning, are obtained. These images are transferred to digital planning software, where the anatomical boundaries of the defect, its relationship with adjacent structures, and the existing bone volume are analyzed three-dimensionally. This step directly influences the accuracy of the patient-specific mesh design (Figure 1).

Fabrication of Patient-Specific Mesh Systems

Using digital models derived from tomographic data, a patient-specific mesh is designed through CAD/CAM technologies. Mesh systems are manufactured from biocompatible materials such as titanium, PEEK, or zirconia using three-dimensional printing or laser sintering methods. During the design phase, geometric features that ensure stabilization of the defect, screw placement sites, and biomechanical resistance are carefully considered (Figure 2).

Surgical Procedure

The surgical procedure for the application of patient-specific mesh systems is generally performed under local anesthesia. The mesh, prepared according to preoperative planning, is placed into the defect site with minimal intraoperative adjustment. This shortens the operation time and reduces intraoperative errors. Autogenous grafts or allograft/xenograft materials are applied either alone or in combination beneath the mesh. The mesh is stabilized with titanium screws. To promote bone regeneration and soft tissue healing, platelet-rich fibrin (PRF), prepared from the patient's blood, is placed on the mesh. The surgical site is then closed primarily under tension-free conditions (Figure 3).

Postoperative Medication Regimen and Follow-Up

Prophylactic antibiotic therapy is administered postoperatively to minimize the risk of infection, and antibiotic use is continued during the postoperative period. Analgesics and anti-inflammatory agents are prescribed for pain management. In the early postoperative period, patients are closely monitored for wound healing, mesh stability, and possible complications. Long-term follow-ups include both radiological and clinical evaluation of bone integration and functional outcomes.

2. Case Report

Case 1: A male patient presenting with bilateral maxillary bone defects underwent reconstruction using a patient-specific titanium mesh. The procedure was performed under local anesthesia (Articain DS-forte). Surgical access was achieved via a mid-crestal incision between the posterior regions with additional vertical releasing incisions. The mucoperiosteal flap was carefully elevated. To ensure tension-free closure, periosteal releasing incisions were performed. A 2 cc autogenous bone graft harvested from the tuberosity region was mixed with 5 cc Maxxeus allograft (Ohio, USA) and placed beneath the mesh. The mesh was stabilized using eight titanium screws. The surgical site was covered with platelet-rich fibrin (PRF) and a resorbable Cytoplast RTM collagen membrane (Texas, USA). Primary closure was achieved using horizontal mattress sutures. Postoperatively, the patient was prescribed antibiotics (Amoxicillin + Clavulanic Acid 1000 mg) and analgesic-anti-inflammatory medication (Diclofenac Potassium 25 mg). Follow-up visits were scheduled on postoperative days 1 and 7, with no complications observed. At the 1.5-month postoperative review, soft tissue dehiscence was noted. The patient was closely monitored for infection risk, with regular follow-ups, local antibiotic washes, and oral hygiene protocols implemented. No systemic infection signs were observed. At the eighth-month follow-up, clinical and radiographic evaluations demonstrated sufficient bone formation in the reconstructed area, allowing for subsequent implant placement (Figure 4).

Case 2: A female patient with posterior left mandibular bone loss underwent reconstruction using a patient-specific mesh. The procedure was performed under local anesthesia (Articain DS-forte). A surgical approach was made via an interpapillary incision extending from the ramus to the premolar region. Vestibular and lingual mucoperiosteal flaps were elevated up to the mylohyoid muscle boundary to achieve tension-free closure. A 1 cc autogenous bone graft harvested from the ascending ramus was combined with 2 cc Maxxeus allograft (Ohio, USA) and placed beneath the mesh. The mental nerve was carefully preserved, and the mesh was fixed with three titanium screws in the buccal region. The surgical site was covered with platelet-rich fibrin (PRF) and a resorbable Cytoplast RTM collagen membrane (Texas, USA). Primary

closure was achieved using horizontal mattress sutures. Postoperative care included antibiotics (Amoxicillin + Clavulanic Acid 1000 mg) and analgesic-anti-inflammatory medication (Diclofenac Potassium 25 mg). Follow-up visits on postoperative days 1 and 7 showed no immediate complications. On day 15, soft tissue dehiscence was observed. Despite regular local washes, healing did not progress, and due to infection risk, the mesh was removed after two months. Case 3: A female patient with complete edentulism of the maxilla underwent bilateral reconstruction using patient-specific titanium mesh. The procedure was performed under local anesthesia (Articain DS-forte). Surgical access was achieved via a mid-crestal incision between the posterior regions with vertical releasing incisions. The mucoperiosteal flap was carefully elevated, and periosteal releasing incisions were performed to enable tension-free closure. Autogenous bone harvested from the tuberosity was mixed with 2 cc Maxxeus allograft (Ohio, USA) and placed beneath the mesh. The mesh was stabilized with eight titanium screws. The surgical site was covered with platelet-rich fibrin (PRF) and a resorbable Cytoplast RTM collagen membrane (Texas, USA). Primary closure was achieved using horizontal mattress sutures. Postoperative care included antibiotics (Amoxicillin + Clavulanic Acid 1000 mg) and analgesic-anti-inflammatory medication (Diclofenac Potassium 25 mg). Follow-up visits on postoperative days 1 and 7 revealed no complications. Subsequent follow-up demonstrated stable surgical sites without any signs of dehiscence or infection. (Table 1)

3. Discussion

Reconstruction of bone defects in the maxillofacial region represents a critical stage prior to implant surgery, both aesthetically, functionally, and biomechanically. Patient-specific mesh systems provide several advantages compared with conventional titanium mesh applications. Owing to preoperative digital planning, an excellent adaptation to the defect site is achieved, eliminating the need for intraoperative adjustments. This reduces surgical time and minimizes soft tissue irritation. Moreover, by three-dimensional stabilization of the grafting material, volumetric resorption is minimized, resulting in more predictable long-term bone gain. In the literature, the bone volume gain achieved with patient-specific mesh systems has generally been reported between 4 and 8 mm (12). Urban et al. (13) reported a mean vertical bone gain of 5.2 ± 2.4 mm in a series of 52 cases using customized meshes. Matthias et al. (14), through volumetric analyses, demonstrated that more than half of the graft volume was preserved. These findings underline the reliability of patient-specific meshes, particularly in cases requiring implant rehabilitation.

Nevertheless, as also observed in our case series, the most frequently reported complication is soft tissue dehiscence. This condition is usually associated with sharp mesh edges or insufficient soft tissue thickness. Soft tissue opening increases the risk of infection and, in some cases, necessitates premature mesh removal. In our series, dehiscence was observed in two of the three patients, one of which required mesh removal. These findings emphasize the importance of enhancing soft tissue thickness, employing PRF applications, and using membrane coverage during surgical planning. Additionally, the number and positioning of screws used for mesh fixation directly influence complication risk. Insufficient screw stability may lead to micromovements and graft resorption (15).

Currently, patient-specific meshes are not only produced from titanium but also from PEEK (polyether-ether-ketone), zirconia, and other biocompatible materials (16,17). Compared with titanium, these materials provide certain advantages, including reduced weight, improved biocompatibility, and reduced irritation of soft tissues (18). Particularly, PEEK facilitates postoperative imaging due to its radiolucent property (19), whereas zirconia is notable for its esthetic advantages and bioinert structure (20). However, clinical data regarding the long-term stability and success rates of these alternative materials remain limited.

In addition to mesh systems, the literature describes various alternative reconstruction methods. Iliac crest autografts have long been considered the “gold standard” for large-volume augmentations, owing to their high osteogenic potential. However, they are associated with disadvantages such as donor-site morbidity, postoperative pain, and functional limitations (21). Subperiosteal implants, especially in severely resorbed maxillae, have recently regained popularity as another alternative (22). Manufactured with modern CAD/CAM technology, these implants enable prosthetic rehabilitation in cases with insufficient bone volume. Nonetheless, their long-term stability and complication profile remain under debate. In more advanced cases, vascularized free flaps (e.g., fibula, scapula, iliac crest flaps) provide reliable results in high-volume reconstructions (23). However, their routine use in pre-implant augmentation is limited due to the need for microsurgical expertise, prolonged operative time, and higher morbidity rates (24).

4. Conclusion

Patient-specific mesh systems represent a minimally invasive, predictable, and patient-friendly option for maxillofacial reconstruction. However, reducing complication risks requires careful patient selection, meticulous surgical technique, sufficient soft tissue management, and regular postoperative follow-up. Future large-scale, prospective, long-term studies will be essential to clarify the effectiveness and safety of these systems—including their variants produced

from alternative materials—through comparative evaluation with conventional methods and alternative reconstruction techniques.

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6. Figures

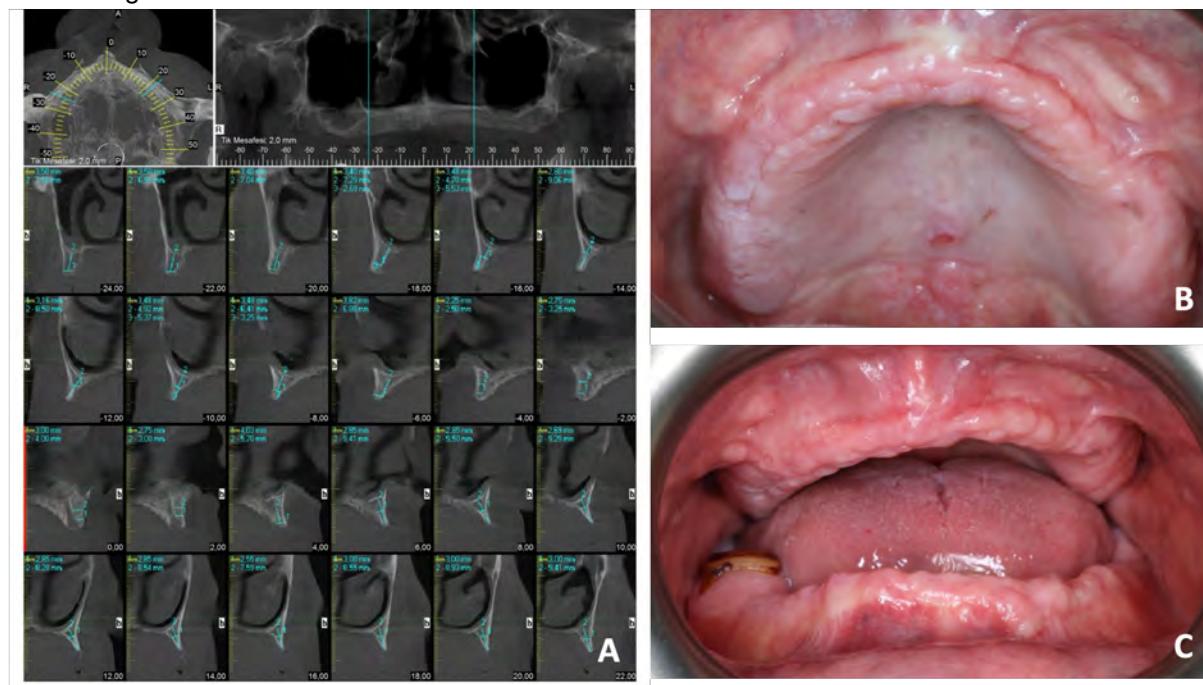


Figure 1: Patient-derived images: (A) cone-beam computed tomography (CBCT) scan, (B) intraoperative view of the maxilla, (C) three-dimensional perspective illustrating the anatomical relationship between the maxilla and the mandible.

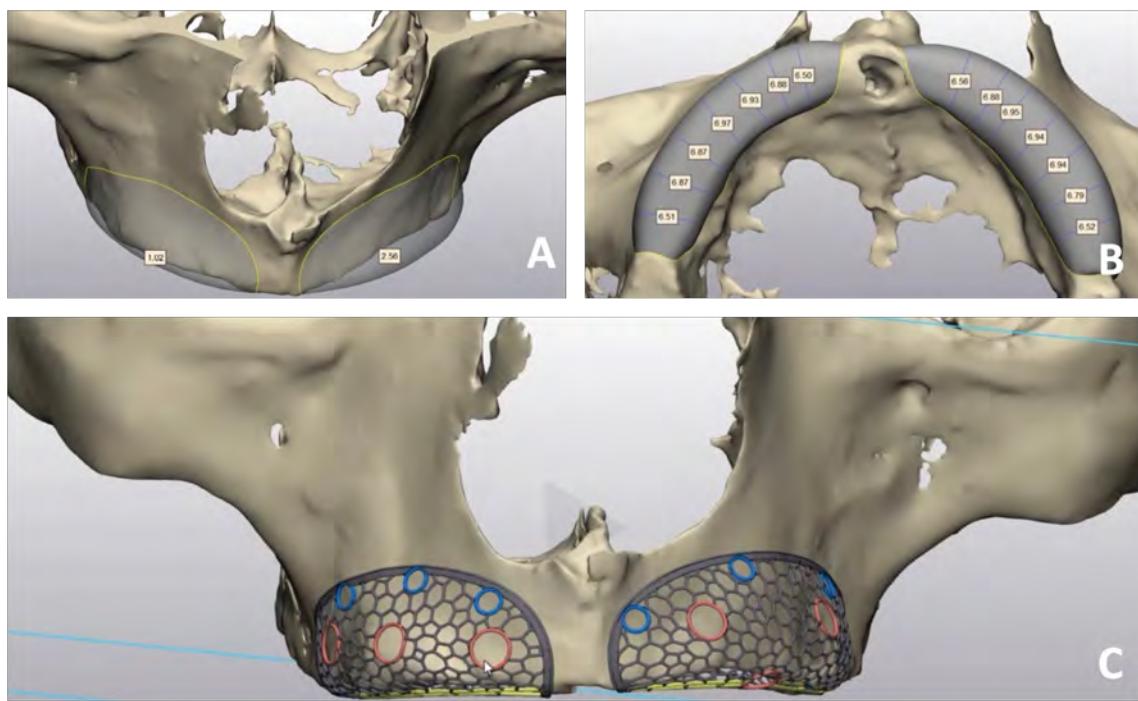


Figure 2: Planned bone volume visualized on digital models reconstructed from the patient's tomographic data with the virtually positioned mesh: (A) vestibular view and (B) vertical view. (C) Mesh design illustrating screw positioning and condensation holes.

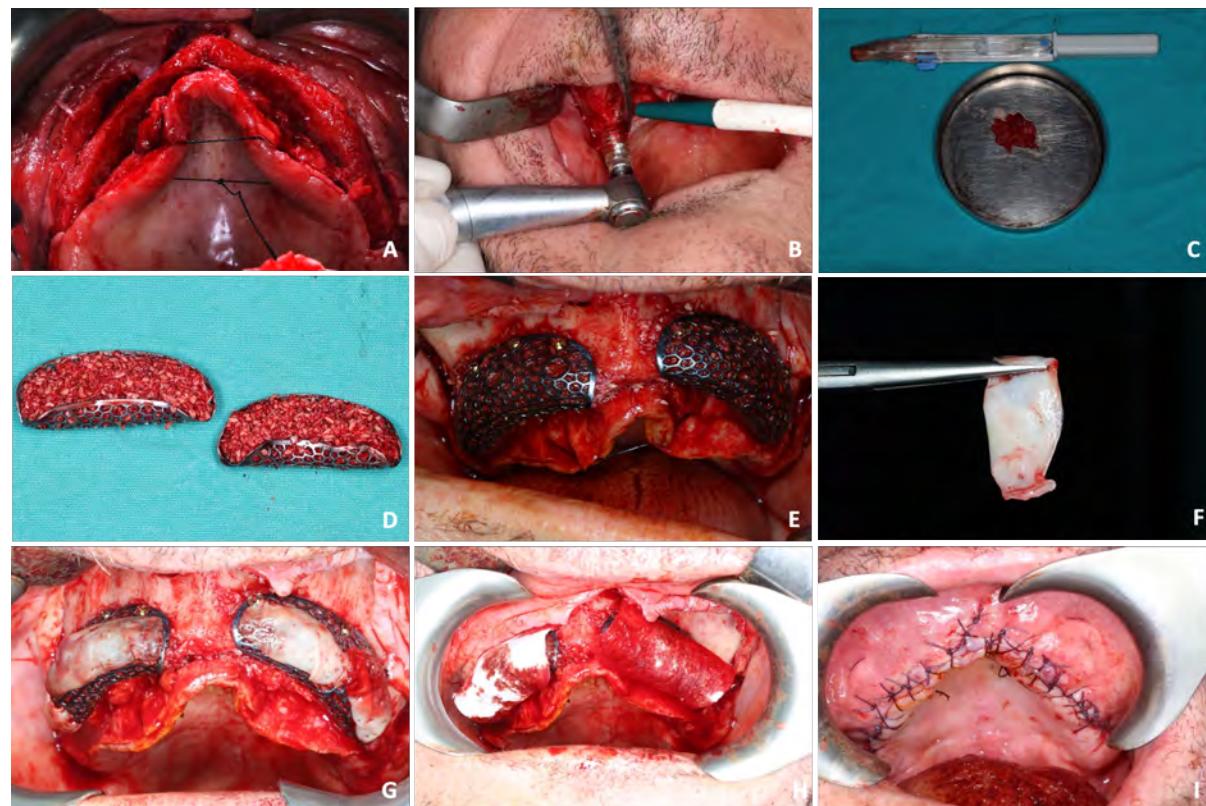


Figure 3: Intraoperative images of the surgical procedure: (A) release of vestibular and palatal flaps, (B) harvesting of autogenous bone from the tuberosity region using a bur, (C) mixing of autogenous bone harvested with a bone scraper and allograft at a 1:1 ratio, (D) placement of bone particles into the mesh, (E) adaptation of the mesh to the maxilla, (F) PRF

obtained from the patient's blood, (G) placement of PRF onto the mesh, (H) coverage with a resorbable membrane, and (I) primary closure of the surgical site.

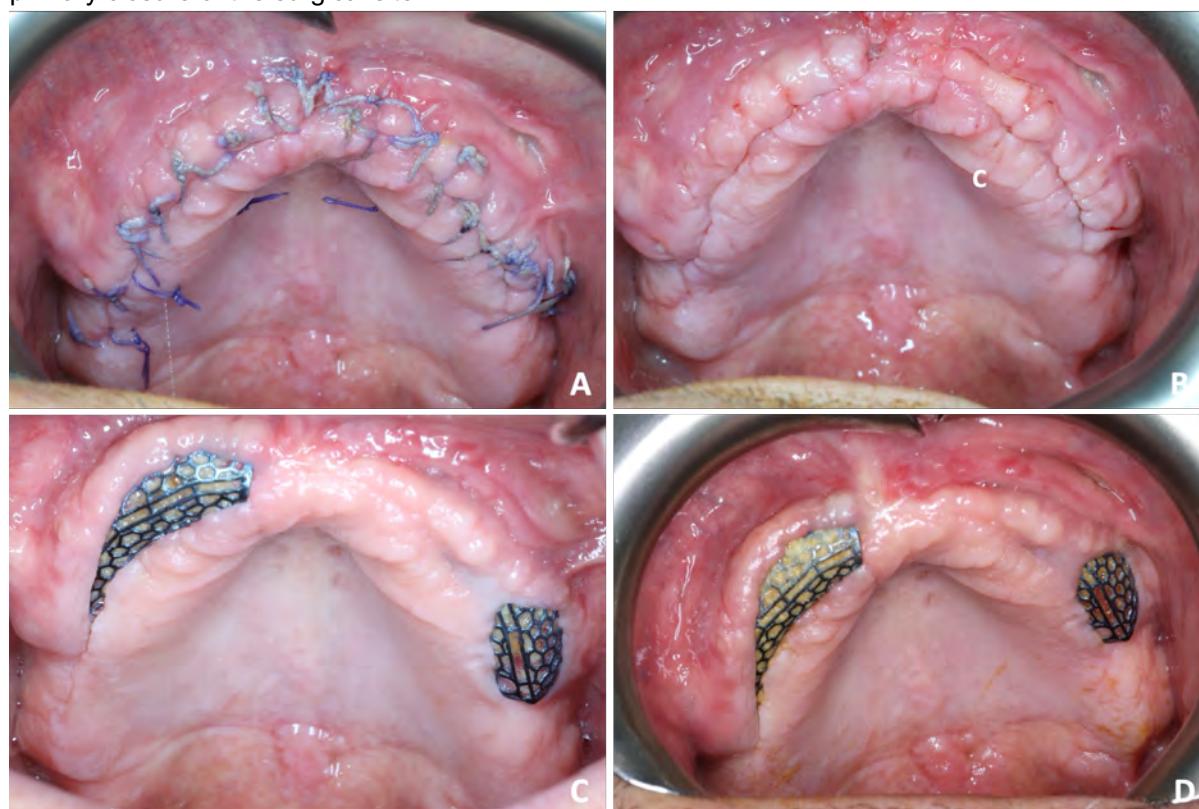


Figure 4: Postoperative follow-up images: (A) suture removal session on the 10th postoperative day, (B) appearance after suture removal, (C) soft tissue dehiscence and mesh exposure observed at the 1.5-month follow-up, and (D) clinical view of the dehiscence at 2 months under regular irrigation.

Tables

Table 1: Comparison of three patient-specific titanium mesh reconstructions, detailing defect location, graft composition, mesh fixation, closure technique, complications, and clinical outcomes.

Case	Patient	Defect Location	Graft Composition	Mesh Fixation	Closure Technique	Postoperative Complications	Outcome
1	Male	Bilateral maxilla	2 cc autogenous (tuberosity) + 5 cc Maxxeus allograft ¹	8 Ti screws ²	Horizontal mattress suture	Soft tissue dehiscence at 1.5 months	Adequate bone formation for implant placement at 8 months
2	Female	Left posterior mandible	1 cc autogenous (ramus) + 2 cc Maxxeus allograft ¹	3 Ti screws ²	Horizontal mattress suture	Soft tissue dehiscence at 15 days; mesh removed at 2 months	Healing compromised; mesh removed due to infection risk
3	Female	Bilateral maxilla	Autogenous (tuberosity) + 2 cc Maxxeus allograft ¹	8 Ti screws ²	Horizontal mattress suture	None	Stable surgical site; no dehiscence or infection; successful outcome

1. Allograft: Maxxeus allograft (Ohio, USA)
2. Ti screws: Titanium screws used for mesh stabilization

SS-068

Novel Approaches in Reconstructive Management of Alveolar Bone Loss: A Case Series

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Abstract

Objective: Alveolar bone loss is a significant condition that may develop due to various local and systemic factors, often complicating implant procedures. In severely atrophic jaws, conventional implant methods are insufficient, thereby necessitating reconstructive surgical techniques. The aim of this presentation is to provide a case-based evaluation of different surgical approaches applied under varying clinical conditions.

Case: Five different surgical techniques were applied in four patients. In the first case, a subperiosteal implant was placed in the posterior mandible following a failed augmentation. In the second case, a fractured implant was removed and replaced using the bone ring technique in combination with an autologous graft harvested from the symphysis. In the third case, due to advanced resorption, three zygomatic and two conventional implants were placed in the maxilla, while six implants were inserted in the posterior mandible following inferior alveolar nerve transposition. In the fourth case, augmentation of the left posterior mandible was performed with a ramus block graft, and implants were placed after the healing period.

Conclusion: This case series demonstrates that various surgical techniques in atrophic jaws have distinct indications. Zygomatic implants are particularly effective in cases of severe maxillary atrophy, whereas nerve transposition may be applied in posterior mandibular resorption. Augmentation procedures tend to yield more predictable outcomes in horizontal defects, while subperiosteal implants may offer advantages in selected patients with minimal bone volume. In conclusion, individualized treatment planning and surgical expertise are critical to achieving long-term success.

Keywords: Zygomatic implant, Subperiosteal implant, Nerve transposition, Augmentation, Reconstructive surgery

1. Introduction

Alveolar bone loss is a key factor directly affecting the success of dental implants. It may result from periodontal disease, trauma, long-term edentulism, or systemic conditions (1). In cases of severe jaw atrophy, conventional implant protocols are often insufficient, necessitating alternative surgical approaches for functional and aesthetic rehabilitation (2).

Reconstructive techniques such as subperiosteal implants, zygomatic implants, augmentation methods, the bone ring technique, and inferior alveolar nerve transposition have gained prominence in recent years (3). These techniques aim to create an anatomically adequate foundation for implant placement. Zygomatic implants provide predictable outcomes in severe maxillary atrophy with both vertical and horizontal deficiencies, while inferior alveolar nerve transposition is a reliable option for the posterior mandible (4,5).

Augmentation procedures show higher success rates in horizontal defects, whereas vertical augmentation has limited long-term stability (6). Subperiosteal implants are preferred in selected cases with minimal bone volume or failed prior interventions (7). Despite the advantages and limitations of each method, case selection and surgical expertise are critical for long-term success.

2. Case Reports

Case 1: A 40-year-old systemically healthy patient had a failed previous augmentation in the posterior mandible. A subperiosteal implant was placed in the region. Healing was uneventful, and the prosthetic restoration was completed one month later. The patient has been followed for one year with satisfactory functional and aesthetic outcomes. (Figure 1)

Case 2: A 70-year-old hypertensive patient presented with a fractured implant. The implant was removed using a trephine bur. A new implant was placed using the bone ring technique with an autogenous graft harvested from the mandibular symphysis. Healing was uneventful. Clinical and radiographic follow-up is ongoing, with maintained functional stability and successful prosthetic adaptation. (Figure 2)

Case 3: A 50-year-old systemically healthy patient received three zygomatic and two conventional implants in the maxilla due to severe resorption. Inferior alveolar nerve transposition was performed in the posterior mandible, and six implants were placed. Postoperatively, transient neurosensory changes were observed. Sensation largely returned during follow-up. The patient continues regular follow-up with satisfactory masticatory function and prosthetic stability. (Figure 3)

Case 4: A 50-year-old systemically healthy patient underwent augmentation of the left posterior mandible using a block graft harvested from the ramus. After 4.5 months of healing, dental implants were placed. The postoperative course was uneventful. Follow-up examinations show stable implants and healthy soft tissues. (Figure 4)

3. Discussion

Rehabilitation of atrophic jaws remains one of the most challenging areas in implantology. No single surgical approach suits all cases; therefore, patient-specific planning and technique selection are essential. This case series highlights the strengths and limitations of each method.

Augmentation techniques have long been used for treating alveolar defects. Horizontal augmentation offers predictable results in increasing ridge width, while vertical augmentation is more complex with lower success rates due to resorption and soft tissue complications (8). Hence, augmentation is preferred in horizontal defects, while alternative techniques may be needed for vertical deficiencies (9).

The bone ring technique allows simultaneous grafting and implant placement, shortening treatment time and providing primary stability (10). However, harvesting from the symphysis may cause donor site morbidity such as contour deformity, sensitivity, and transient numbness (11). Proper graft stabilization and soft tissue closure are critical for success.

Inferior alveolar nerve transposition enables implant placement in cases of severe posterior mandibular resorption where augmentation is insufficient. Its major drawback is the risk of temporary or permanent neurosensory complications.

Transient paresthesia rates are reported between 20%–50%, with most cases showing sensory recovery over time (12).

Zygomatic implants provide a reliable solution for severe maxillary atrophy, offering support in both vertical and horizontal bone loss. They also allow early loading, improving patient quality of life. However, surgical complexity, a steep learning curve, and sinus-related complications such as sinusitis or oroantral fistula are major limitations (7).

Subperiosteal implants are an alternative for selected patients with minimal bone volume and failed prior interventions. Unlike endosseous implants, they do not achieve direct osseointegration; stability is achieved through anatomical adaptation and fixation screws (13). Therefore, primary stability is defined mechanically, not by insertion torque (14). Their advantages include minimal surgical invasiveness and early prosthetic restoration, while disadvantages include soft tissue irritation, implant exposure, and long-term biomechanical complications (15).

In summary, augmentation remains the most predictable for horizontal defects, whereas bone ring techniques or zygomatic implants may be more favorable for vertical deficiencies. Nerve transposition is a viable option when severe resorption prevents posterior mandibular augmentation. Subperiosteal implants may serve as an alternative in cases with minimal bone volume where other techniques are not feasible. Thus, the choice of technique depends on defect morphology, systemic health, and surgical expertise (16).

4. Conclusion

Surgical approaches for atrophic jaw rehabilitation vary based on defect orientation, severity, and patient-specific factors. While horizontal augmentation offers predictable outcomes, vertical augmentation shows limited success. The bone ring technique shortens treatment time but involves donor site morbidity. Zygomatic implants are a reliable option for severe maxillary atrophy, and nerve transposition allows implant placement in the posterior mandible but carries neurosensory risks. Subperiosteal implants may be considered in selected cases, though limited by lack of osseointegration and soft tissue complications.

This case series demonstrates that each technique has specific indications, and long-term success depends on individualized planning and surgical expertise.

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6. Figures



Figure 1: Placement of a subperiosteal implant in the posterior mandible after failed augmentation.

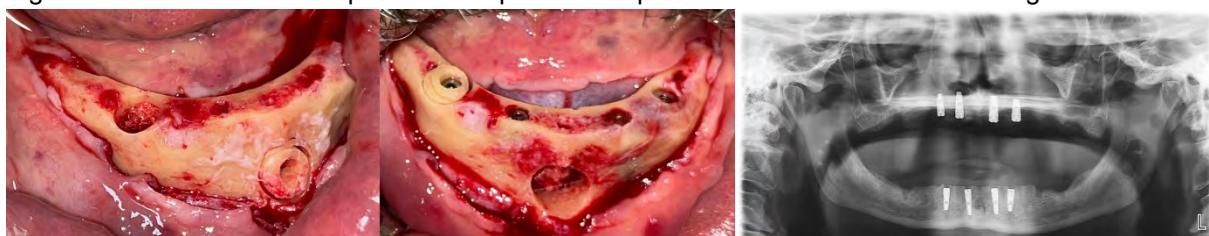


Figure 2: Use of the bone ring technique with an autogenous graft harvested from the mandibular symphysis. Immediate implant placement and graft stabilization are shown.



Figure 3: Simultaneous placement of zygomatic and conventional implants in the maxilla. Inferior alveolar nerve transposition was performed in the posterior mandible for implant support.



Figure 4: Block graft augmentation in the posterior mandible using a graft harvested from the mandibular ramus. Post-healing image demonstrates sufficient bone volume for implant placement.

SS-070

YouTube as a Source of Information on Sinus Lift Procedures in Turkey: Content Quality, Accuracy, and Viewer Health Literacy

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Abstract

Objective: This study evaluated the content quality, accuracy, and educational value of Turkish-language YouTube videos on sinus lift procedures, along with viewer engagement and digital health literacy.

Materials and Methods: On April 23, 2024, between 07:00 and 19:00, YouTube Turkey was searched using a new Google account to avoid recommendation bias. Videos containing the keywords "sinüs yükseltme" or "sinüs kaldırma" were included. Videos without audio, in non-Turkish languages, longer than 30 minutes, containing advertisements, or unrelated to the topic were excluded. Data on view count, duration, time since upload, likes, dislikes, comments, upload source, and video type were collected. Videos were classified as educational or testimonial and evaluated independently by an oral and maxillofacial surgeon and a fifth-year dental student using the Video Information and Quality Index (VIQI) and Global Quality Scale (GQS). Viewer engagement was calculated using the interaction index and view rate.

Results: Most videos were uploaded by health professionals and were educational. Median VIQI and GQS scores indicated low to moderate quality. Videos often lacked author identification, publication date, references, and detailed coverage of surgical procedures or complications. Viewer engagement was moderate, and no significant differences were observed between evaluators.

Conclusion: Turkish YouTube videos on sinus lift procedures have low educational quality despite professional involvement. Key information is often missing, reducing their value. Health professionals should provide evidence-based content, and viewers should critically assess it.

Keywords: Sinus lift, YouTube, Video Information and Quality Index, Global Quality Scale.

1. Introduction

The initial applications of the maxillary sinus augmentation procedure marked a significant milestone in oral and maxillofacial surgery. This procedure was originally developed to address the challenges arising from alveolar bone resorption and maxillary sinus pneumatization following tooth loss in the posterior maxilla, which often results in insufficient bone volume for conventional prosthetic restorations [1]. In early applications, dentists and surgeons aimed to create a new bone compartment by elevating the Schneiderian membrane, thereby providing a more stable foundation for complete removable dentures and implant placement [2].

Various techniques have since been developed to overcome insufficient bone height in implant surgery. The choice between different methods, such as transcrestal sinus membrane elevation and minimally invasive lateral window techniques, depends on the specific anatomical, functional, and aesthetic requirements of each patient. When performed with proper case selection and precise surgical technique, these procedures can significantly improve the prognosis of dental implants in areas with limited vertical bone dimension [3-7].

In parallel with these clinical developments, digital platforms such as YouTube have increasingly become a preferred source for health information. In a recent exploratory study, 87.6% of participants reported watching health-related content on YouTube and 84.7% indicated that their viewing influenced their health-related decisions [8]. However, the platform's wide accessibility also facilitates the rapid spread of misleading or false information, posing a significant risk for individuals with low health literacy. Notably, the COVID-19 pandemic and vaccine-related misinformation have highlighted concerns regarding the reliability of online health information [9].

In line with observations in related domains, several recent studies indicate that many health-related videos on YouTube fail to meet important transparency and educational criteria. For instance, Pavuloori et al. (2025) report that a significant number of videos assessed under the JAMA Benchmark Criteria do not provide essential authorship or upload date information, and often omit references or attribution [10]. Similarly, Chawla et al. (2021) found in their evaluation of liposuction content that many videos lacked comprehensive discussion of treatment options, were vague about who produced them, and did not list sources or references [11]. Moreover, Wu et al. (2022) showed that in videos about functional endoscopic sinus surgery (FESS), the explanation of surgical procedures and potential complications was often superficial, and information regarding author identity and dates was frequently missing [12].

These findings suggest that, much like in these related fields, YouTube videos dealing with sinus lift procedures may similarly fall short in transparency (author, date, referencing) and comprehensiveness (detailed surgical steps, possible complications), thereby undermining their educational value.

Health content on YouTube does more than simply deliver information passively; it also plays a crucial role in shaping health perceptions through user engagement and the social features of the platform. Studies show that metrics such as likes, comments, and shares significantly influence users' perceived credibility of health content[13]. Furthermore, YouTube viewing experiences have been found to enhance components of digital health literacy—including the ability to search for, understand, evaluate, and apply health information—especially when viewers feel connected to content creators through parasocial relationships [14]. Research also indicates that many health-related social media posts lack transparency, particularly in authorship, date, and sourcing, which undermines trust and academic accountability [15].

Moreover, health information must be accurate, up-to-date, and presented in a clear, understandable, and audience-appropriate manner. Research has shown that content containing overly technical or complex terminology can reduce comprehension—particularly among individuals with low health literacy—and limit the effective utilization of health information. Visual and user-friendly formats further improve understanding, highlighting the need for health institutions, content creators, and stakeholders to prioritize simplicity and accessibility in the design of health information [16, 17].

This study aims to evaluate the content quality, accuracy, and educational value of "sinus lift" videos available on YouTube Turkey using the Video Information and Quality Index (VIQI) and the Global Quality Scale (GQS), and to assess the current state of digital health literacy among viewers.

2. Materials And Methods

Google Trends is an online search tool that organizes the most frequently used keywords, topics, and phrases over a specific period and across different regions of the world. Using this application, after performing a search for "sinüs yükseltme" (sinus lift), we observed that the most frequently used terms were "sinüs kaldırma" (sinus elevation) and "sinüs yükseltme" (Google Trends Turkey, 2024). Therefore, for our study conducted on YouTube Turkey, "sinüs yükseltme" was selected as the main keyword.

The study day was set for April 23, 2024, between 07:00 and 19:00. To avoid video recommendations based on viewing history, a new Google account was created. Within the scope of the research criteria, the search was limited to Turkish-language videos

Inclusion criteria:

1. Turkish-language videos
2. Videos containing the keywords "sinüs yükseltme" or "sinüs kaldırma"

Exclusion criteria:

1. Videos without audio
2. Videos in languages other than Turkish
3. Videos containing advertisements or requiring paid subscriptions
4. Videos longer than 30 minutes
5. Videos unrelated to the topic

Selected videos will undergo a comprehensive evaluation, and data will be collected on view count, video duration, time since upload, number of comments, number of likes and dislikes, and upload source (categorized as healthcare professionals: oral surgeon, periodontist/dentist; commercial/informative; or amateur/other). Videos will also be classified into two types: educational or testimonial (patient experience or auxiliary staff information).

Viewer engagement will be calculated using the interaction index (likes – dislikes / total views × 100) and view rate (views / days since upload × 100). Videos will be independently evaluated by an oral and maxillofacial surgeon with 10 years of experience and a 5th-year dental student. The overall quality of videos will be assessed using the Video Information and Quality Index (VIQI). This scale evaluates video features such as information flow, accuracy, quality, and precision using a 5-point Likert scale (1 = poor, 5 = high). In the total content score and VIQI calculation, videos above the mean will be categorized as high, and those below the mean as low. This calculation will be determined separately for the two observers.

The educational quality and qualitative assessment of the videos will be performed independently by two evaluators using the Global Quality Scale (GQS). The GQS is a 5-point scale that represents the overall educational quality of the videos. Videos scoring 1–2 points are categorized as "low," 3 points as "moderate," and 4–5 points as "high" quality, with higher scores indicating better video quality.

Statistical analysis

The study data will be analyzed using SPSS version 27.0, with a 95% confidence interval. For categorical (qualitative) variables, frequency and percentage (n, %) statistics will be reported, and for numerical (quantitative) variables, mean, standard deviation (mean ± SD), minimum, maximum, and median will be presented.

Parametric tests will be applied when the normality assumption is satisfied; otherwise, non-parametric tests will be used. Comparisons of the measured parameters between groups will be performed using the independent samples t-test / Mann-Whitney U test (for two groups). Cohen's Kappa test will be used to assess inter-observer agreement. A p-value of <0.05 will be considered statistically significant.

3. Results

For the 17 evaluated videos, the median values were as follows: view count, 3100; video duration, 148.88 seconds; time since upload, 730 days; likes, 12; dislikes, 0; engagement index, 12; and view rate, 425. VIQI scores averaged 10 for the student and 8.647 for the specialist, with a combined mean VIQI score of 9.129. The median GQS score for all videos was 2. (Table 1)

Health professionals were the upload source in 88.2% of videos, while informational sources accounted for 11.8%.

Regarding video type, 88.2% were educational and 11.8% were patient testimonials. (Tablet 2)

Average total VIQI scores were 10 for students and 8.071 for specialists, with no statistically significant difference between observers ($p = 0.088$). Median GQS scores were 3 for students and 2 for specialists, with no significant observer difference ($p = 0.061$). (Table 3)

4. Discussion

This study systematically evaluated Turkish-language sinus lift videos on YouTube based on VIQI and GQS criteria. Most videos were found to be of low to moderate quality, with user-generated content scoring lower than professional or academic sources. These findings highlight the ongoing need to enhance reliability and establish quality standards for online health information.

YouTube is increasingly used as a source of health information; approximately one-third of users access health-related content through the platform[18] However, its wide reach facilitates the rapid dissemination of inaccurate information, posing a risk for individuals with low health literacy. The COVID-19 pandemic has exemplified the consequences of misinformation and emphasized the importance of reliable digital health communication[9].

Recent evaluations of YouTube as a health information source have revealed significant shortcomings in content quality. Low DISCERN and JAMA Benchmark scores are frequently reported, reflecting insufficient details on treatment options, incomplete disclosure of authorship, missing publication dates, and the absence of referenced sources, which undermine transparency and accountability [19, 20]. Surgical procedures are often described only superficially, while potential complications are underrepresented, thereby limiting the educational utility of these videos [19].

Beyond information delivery, online health content actively shapes users' perceptions and behaviors through interactive features such as comments, likes, and shares. Therefore, strengthening digital health literacy among both viewers and content creators is crucial. Evidence demonstrates that individuals with low health literacy experience poorer healthcare utilization, reduced adherence to treatment, and increased healthcare costs[21, 22]. These findings highlight the necessity for both policy-level interventions and professional engagement in digital health communication to ensure reliability and educational value.

Health information must be accurate and up-to-date, but that alone is insufficient: information should also be accessible, clear, and understandable for diverse audiences. Research shows that the use of complex or highly technical terminology significantly impedes comprehension, especially among individuals with low health literacy[17]. Visual and audiovisual materials have been found to enhance understanding and health literacy more effectively than text-only content[16]. Health institutions and stakeholders therefore should prioritize simple, plain language and user-friendly formats in the design of health information to ensure equity and utility for all audiences

5. Conclusion

Health professionals and content creators should be encouraged to produce evidence-based, high-quality educational materials online. Users should approach digital health content critically to ensure positive individual and public health outcomes. Strengthening quality control mechanisms on popular platforms like YouTube is essential for reliable online health communication.

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Table 1. Descriptive Statistics of Quantitative Variables

Variable	Mean \pm SD	Median (min–max)	Q1	Q3
View count	5835.353 \pm 7771.246	3100 (43–27000)	763	5100
Video duration (s)	148.882 \pm 87.88	107 (44–338)	90	226
Time since upload (days)	1336.177 \pm 1203.57	730 (30–4015)	365	1825
Likes	69.353 \pm 167.702	12 (1–641)	5	22
Dislikes	0 \pm 0	0 (0–0)	0	0
Engagement index	69.353 \pm 167.702	12 (1–641)	5	22
View rate	1658.294 \pm 3842.685	425 (14–16000)	57	1096
VIQI – Student	10 \pm 2.958	10 (5–17)	8	11
VIQI – Specialist	8.647 \pm 3.121	9 (4–13)	6	11
Total VIQI	9.129 \pm 3.128	9 (4–17)	7.5	10.5
GQS	2.29 \pm 1.006	2 (1–5)	2	3

SD: Standard Deviation; min: Minimum; max: Maximum; s: second;
VIQI: Video Information and Quality Index ; GQS: Global Quality Scale.

Table 2. Descriptive Statistics of Qualitative Variables

Variable	Frequency	Percentage
Upload source – Health professionals	15	88.2
Upload source – Informational	2	11.8
Video type – Educational	15	88.2
Video type – Patient testimonial	2	11.8

Table 3. Comparison Between Observers

Variable	Student	Specialist	Total	Test Statistic	p
Total VIQI	10 ± 2.958	8.071 ± 3.1	9.129 ± 3.128	1.768	0.088 ¹
GQS	3 (1–5)	2 (1–4)	2 (1–5)	164.500	0.061 ²

VIQI: Video Information and Quality Index ; GQS: Global Quality Scale

¹Independent t-test; ²Mann–Whitney U test

SS-075

Rehabilitation of Atrophic Jaws Using Iliac Graft and Inferior Alveolar Nerve Lateralization: Case Report

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Objective:

The aim of our study is to describe the combined use of iliac graft augmentation and inferior alveolar nerve lateralization techniques in a patient with insufficient bone volume, and to evaluate its success in implant-supported rehabilitation.

Case Report and Literature Review:

A 30-year-old systemically healthy female patient presented to the Department of Oral and Maxillofacial Surgery, Uşak University Faculty of Dentistry, with widespread dental pain. Clinical and radiological evaluations revealed teeth with insufficient bone support. Tooth extraction and implant indication were determined. Both in the maxilla and the mandible, insufficient bone volume was observed for implant placement. After the extraction of all teeth, the bone defect in the anterior maxilla was augmented with a graft harvested from the iliac crest. Due to vertical bone deficiency in the mandible, bilateral inferior alveolar nerve lateralization was performed, and implants were placed simultaneously. A healing period of 6 months was allowed for osseointegration of the graft in the maxilla, after which implant placement was carried out. No complications were observed during the 2-year follow-up period.

Conclusion:

To the best of our knowledge, no previous study has reported the combined use of the procedures performed in this surgery. The combination of iliac graft augmentation and inferior alveolar nerve lateralization provides successful and long-term stable outcomes in implant treatment for the rehabilitation of atrophic jaws.

Keywords: Iliac graft, IAN lateralization, atrophic jaw

1. Introduction

Severe alveolar resorption presents significant surgical and prosthetic challenges in dental implant therapy. Particularly following complete edentulism, vertical and horizontal bone loss can reduce the available bone volume necessary for implant placement, thereby hindering fixed prosthetic rehabilitation [1]. In the reconstruction of such defects, autogenous iliac crest bone grafts are frequently preferred due to the ability to harvest a large volume of bone.

In the mandible, when severe atrophy and vertical bone loss occur, the placement of implants becomes impossible, especially when insufficient bone remains above the level of the inferior alveolar nerve (IAN). In such cases, IAN lateralization or transposition procedures may be considered [2, 3].

This report presents a case of combined surgical management in a patient with severe atrophic maxilla and mandible, followed for two years. In this case, the maxilla was augmented using an autogenous anterior iliac crest bone graft, bilateral IAN lateralization was performed in the mandible, and a total of 12 implants were placed.

2. Case Report

A 30-year-old female patient presented to our clinic seeking implant rehabilitation due to loss of supporting bone around her teeth. Clinical examination and cone-beam computed tomography (CBCT) revealed vertical and horizontal bone loss in the anterior maxilla and severe atrophy in the mandible, with insufficient bone above the IAN for implant placement.

For maxillary anterior augmentation, following anesthesia induction, a partial-thickness sulcular incision was made in the labial vestibule, and a mucoperiosteal flap was elevated to expose the alveolar crest. The recipient site was measured to determine the volume of graft required for reconstruction. Before incision, the anterior iliac crest, including key anatomical landmarks such as the anterior superior iliac spine (ASIS) and the anterosuperior iliac tubercle, was marked. To ensure the postoperative scar remained lateral, the skin was slightly retracted medially before incision. A 3–4 cm incision was made parallel to the anterior iliac crest, approximately 1–2 cm posterior to the iliac tubercle and 1 cm posterior to the ASIS.

Subcutaneous tissues, muscular attachments, and periosteum were dissected to expose the anterior iliac crest. Under sterile saline irrigation, a tricortical (corticocancellous) bone block was harvested using a microsaw. Cancellous bone chips were also collected from the donor site by curettage. The wound was closed in layers.

The graft was shaped according to the recipient site and fixed to the anterior maxilla with titanium screws. The surrounding area was filled with particulate autogenous bone and covered with a barrier membrane. The donor site was closed primarily, and no postoperative complications occurred in the iliac region.

During bilateral IAN lateralization, regional anesthesia was achieved with 4% articaine hydrochloride containing 1:100,000 epinephrine. A crestal incision extending from the retromolar to the lateral region was made, followed by vertical releasing incisions. A mucoperiosteal flap was raised, and the mental foramen along with the neurovascular bundle was carefully exposed.

On both sides, a cortical window was created over the IAN in the premolar–molar region. The cortical bone above the canal was removed, and the nerve was carefully mobilized and transposed. Following nerve repositioning, implant osteotomies were prepared and implants were placed in the same session. The nerve was protected and stabilized in its new position, and the flap was closed primarily.

After a six-month healing period of the augmented maxilla, implants were placed. In total, 12 implants were inserted in the upper and lower jaws. All implants demonstrated good primary stability and successful osseointegration before loading.

The patient's prosthetic rehabilitation was completed successfully.

During three years of follow-up, no implant failure or peri-implant complications were observed. A mild transient paresthesia was noted in the early postoperative period but resolved completely within three months without any permanent sensory deficit. No donor site morbidity was reported.

3. Discussion

In this case, a severely atrophic maxilla and mandible were successfully rehabilitated using a combination of autogenous iliac crest bone grafting and bilateral IAN lateralization.

Autogenous bone remains the gold standard graft material due to its osteogenic, osteoinductive, and osteoconductive properties [4]. While intraoral donor sites are sufficient for small defects, extraoral donor sites are preferred in cases of advanced atrophy. Particularly, corticocancellous block grafts harvested from the anterior iliac crest are commonly used because they provide large volumes, possess high osteogenic potential, and can be easily shaped [5, 6].

Both anterior and posterior approaches have been described for iliac crest harvesting. Orthopedic and neurosurgeons often prefer the posterior approach, which has been associated with sacroiliac joint instability [7]. Maxillofacial surgeons, however, commonly use the anterior approach, as demonstrated in the present case. Although the anterior approach is considered a low-morbidity procedure, minor complications such as gait disturbance, paresthesia, hematoma, superficial infection, and pain have been reported [7, 8]. In our case, no donor site complications were encountered.

Several authors have recommended the use of barrier membranes to minimize the quantitative and qualitative resorption of autogenous block grafts. Monje et al. [9] reported that the application of a resorbable collagen membrane represents a predictable technique for horizontal ridge augmentation in the anterior maxilla. In the present case, barrier membranes were used, and no complications related to graft integration or bone healing were observed.

Reported implant survival rates after iliac block graft augmentation range from 89% to 99% [5, 6, 10]. Sethi et al. [6] reported an implant survival rate exceeding 90% after a 16-year follow-up. [11] In our case, the implant survival rate was 100%.

In the mandible, nerve repositioning procedures are viable techniques that enable implant placement in severely atrophic cases. Abayev and Juodzbalys [12], in a systematic review, reported transient neurosensory disturbances in 30–50% of cases and permanent deficits in approximately 7%. A more recent meta-analysis by Vinci et al. [13] found a 6% rate of persistent sensory loss. In our patient, transient paresthesia was observed but resolved completely, which may be attributed to meticulous nerve mobilization and immediate implant placement in the same session.

4. Conclusion

In cases of severely atrophic maxilla and mandible, a combination of autogenous iliac crest augmentation and bilateral IAN lateralization allows successful implant rehabilitation. After two years of follow-up, no implant loss, donor site morbidity, or permanent neurosensory deficit was observed. Despite the potential complications reported in the literature, with proper case selection, careful surgical technique, and diligent postoperative follow-up, this combined approach can provide reliable and effective outcomes.

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SS-076

DENTAL ANESTHESIA STRATEGIES IN PARKINSON'S DISEASE:
A CASE SERIES

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Abstract

Objective: To present perioperative considerations and anesthesia management strategies in patients with Parkinson's disease (PD) undergoing dental and maxillofacial procedures, highlighting the role of local anesthesia, sedation, and general anesthesia across different disease stages.

Cases: We report three PD patients at distinct stages of disease progression.

Case 1: A 45-year-old man with early-stage PD controlled on rasagiline underwent third molar surgery under local anesthesia with articaine and limited midazolam sedation without complications.

Case 2: A 60-year-old woman with moderate PD on levodopa and entacapone received multiple extractions and implant placement under local anesthesia and minimal sedation with midazolam-propofol infusion, achieving stable hemodynamic control.

Case 3: A 72-year-old man with advanced PD, motor fluctuations, cognitive decline, and multiple medications underwent zygomatic implant surgery under general anesthesia with TIVA and ICU admission, ensuring safe perioperative management.

Conclusion: Dental procedures in PD patients can be safely performed under local anesthesia, minimal sedation, or general anesthesia when tailored to disease stage and comorbidities. Early-stage patients may tolerate limited sedation with vasoconstrictor-containing anesthetics, while advanced cases often require general anesthesia with intensive monitoring. Multidisciplinary collaboration and individualized protocols are essential to optimize perioperative outcomes.

Key Words: Parkinson's disease, Dental anesthesia, Local anesthesia, Case report

1- Introduction

Parkinson's disease (PD) represents the second most prevalent neurodegenerative disorder after Alzheimer's disease (1). Advancing age is the major risk factor, with most diagnoses occurring after the age of 50 and peaking between 75 and 84 years. Early-onset PD, presenting before the age of 40, is uncommon. Male sex confers a higher risk, with men affected approximately 1.5 times more often than women (2).

Parkinsonism arises from progressive loss of dopamine-producing neurons in the brain. It is commonly defined as a clinical syndrome manifested by resting tremor, bradykinesia, muscular rigidity, impaired postural control, shuffling gait, stooped posture, reduced facial expression, and micrographia (3).

Although PD is traditionally classified as a movement disorder defined by cardinal motor features such as bradykinesia, rigidity, gait disturbance, and resting tremor, a broad spectrum of nonmotor symptoms—including autonomic, cognitive, and behavioral impairments—also complicate perioperative management and contribute to morbidity. Frailty and cognitive decline, which are common in people with PD, further increase perioperative risks (4). The literature on PD and surgery is limited and yields conflicting findings. Some reports suggest that PD patients fare worse than age-matched controls in both elective and emergency surgery (5), whereas others describe only minor differences in outcomes (6).

Oral health has historically received little emphasis in the management of neurodegenerative diseases. Patients, caregivers, and healthcare providers tend to prioritize conditions such as dementia and motor impairments (7). However, oral and dental health in this population remains under-researched, with few high-quality studies and often contradictory results (8). To date, no comprehensive overview has explored the relationship between oral health, the clinical features of PD, and the broader implications of this association for general health. More recently, initiatives have been undertaken to provide guidance on the dental management of PD patients in clinical settings (9).

The purpose of this case series is to present the anesthetic considerations and perioperative management of three PD patients at different stages of disease progression who underwent dental and maxillofacial procedures. By outlining tailored approaches involving local anesthesia, minimal sedation, and general anesthesia, this study aims to highlight practical strategies that ensure safe and effective care in this vulnerable patient population.

2- Case Reports

Case 1: Early-stage PD

A 45-year-old male patient with a 3-year history of PD presented with tremor and bradykinesia but was otherwise functionally independent. His symptoms were well controlled with rasagiline monotherapy (MAO-B inhibitor). The patient was scheduled for third molar surgery. Neurology consultation recommended continuation of rasagiline on the day of surgery and allowed the use of local anesthetics containing low-dose epinephrine. The patient was monitored hemodynamically. To suppress gag reflex, 3 mg intravenous midazolam was administered. Local anesthesia was achieved with 4% articaine containing 1:100,000 epinephrine, limited to two cartridges. The procedure was completed uneventfully, and no perioperative complications were observed.

Case 2: Moderate PD (grey-zone age)

A 60-year-old female patient with an 8-year history of PD reported moderate motor symptoms partially limiting daily activities. She was treated with levodopa–carbidopa combined with entacapone (COMT inhibitor) to reduce “wearing-off” episodes. The patient required three extractions and placement of four implants. Neurology consultation emphasized continuation of levodopa and entacapone on the day of surgery, limiting the dose of vasoconstrictor-containing anesthetics, and cautious use of sedation. The patient was monitored continuously. Sedation was initiated with 2 mg intravenous midazolam followed by a propofol infusion at 1 mg/kg/h. Local anesthesia was administered using 2% articaine with 1:100,000 epinephrine, limited to two cartridges due to potential interaction with entacapone. The operation proceeded without adverse hemodynamic events.

Case 3: Advanced PD in an elderly patient

A 72-year-old male patient with a 15-year history of PD exhibited motor fluctuations, dyskinesias, and mild cognitive impairment. His treatment included high-dose levodopa–carbidopa, safinamide (MAO-B inhibitor), amantadine, and low-dose clozapine for hallucinations. The patient was scheduled for zygomatic implant placement. Neurology consultation advised continuation of all antiparkinsonian medications on the day of surgery, avoidance of epinephrine in local anesthetics, avoidance of sedatives due to cognitive impairment, and consideration of general anesthesia with close postoperative monitoring. A postoperative intensive care bed was arranged preoperatively. General anesthesia was induced with controlled intravenous agents, followed by maintenance using total intravenous anesthesia (TIVA) with propofol and remifentanil. Local infiltration with articaine without epinephrine was applied at the surgical site. Postoperative analgesia was provided with dexketoprofen. The patient was transferred intubated and sedated to the intensive care unit for further monitoring.

3- Discussion

The anesthetic care of patients with PD is particularly complex due to the interplay of motor symptoms, nonmotor dysfunctions, and pharmacologic interactions. Perioperative risks such as aspiration, autonomic instability, and postoperative delirium are consistently highlighted in the literature (3, 10).

Our first case demonstrated that early-stage PD patients can be safely managed under local anesthesia with limited sedation, consistent with evidence that MAO-B inhibitors such as rasagiline do not contraindicate cautious use of vasoconstrictor-containing local anesthetics. In the second case, perioperative continuation of levodopa and adjunctive COMT inhibitors was crucial, as abrupt withdrawal is associated with severe motor deterioration and even life-threatening complications. Restricting vasoconstrictor dosage was justified, given reports of potentiated catecholamine effects in patients on COMT inhibitors (3).

In the third case, advanced PD necessitated general anesthesia with intensive postoperative monitoring, reflecting prior observations that advanced disease increases the likelihood of perioperative complications, including dysautonomia and neuropsychiatric disturbances (3, 11). Moreover, antipsychotics with dopaminergic antagonism should be avoided in this group, with clozapine or quetiapine being the preferred alternatives (10).

Overall, our cases reinforce the principle that anesthetic strategies in PD should be individualized. Early and moderate disease may be managed with local anesthesia and carefully titrated sedation, while advanced disease often requires general anesthesia and multidisciplinary planning (10, 12).

4- Conclusion

The management of PD in dental and maxillofacial surgery requires more than routine anesthetic planning; it demands a stage-specific, individualized approach. Early-stage patients can often be treated effectively with local anesthesia and minimal sedation, while those in the moderate stage necessitate strict titration of sedatives and cautious use of

vasoconstrictors. In advanced disease, the complexity of motor fluctuations, cognitive decline, and systemic instability frequently mandates general anesthesia and intensive postoperative monitoring.

Ultimately, safe and successful outcomes depend on meticulous continuation of antiparkinsonian therapy, vigilant perioperative assessment, and close collaboration between dental surgeons, anesthesiologists, and neurologists. By integrating these principles, clinicians can transform a high-risk scenario into a manageable and predictable pathway of care, ensuring both patient safety and treatment success.

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SS-077

Mandibular Sinir Kanalına Yerleşen İmplantlara Bağlı Bilateral Hipoestezi Ve Literatür Değerlendirmesi

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GİRİŞ: Dental implant cerrahisi genellikle güvenli bir prosedür olmasına rağmen, mandibular sinir yaralanması nadir fakat ciddi bir komplikasyon olarak kabul edilir. Sinir penetrasyonu veya basisi, özellikle implantın uzun süre sinir kanalı içinde kalması durumunda kalıcı duyusal bozukluklara yol açabilir. Bu vaka, mandibular sinir kanalına penetrasyon yapan implantlara bağlı gelişen uzun süreli bilateral hipoesteziyi ve cerrahi yönetimini göstermektedir.

VAKA RAPORU: 67 yaşında kadın hasta, mandibular bölgeye diş merkezde 6 üyeli dental implant yerleştirilmesini takiben alt dudak ve çene bölgesinde bilateral uyuşukluk ile kliniğimize başvurdu. İmplantlar 8 ay boyunca yerinde kaldı ve şikayetler geçmedi. Klinik muayenede belirgin bilateral hipoesteziyi saptandı. CBCT incelemesinde 36 ve 46 numaralı diş bölgelerine yerleştirilen implantların mandibular sinire penetrasyon gösterdiği tespit edildi. İlgili iki implant çıkarıldı. Operasyon sırasında bir tarafta sinir dokusunda travmaya bağlı bütünlük bozulması, diğer tarafta ise sinir yapısının invazyonuna rağmen bütünlüğün korunması gözlemlendi. Kalan dört implant üzerine protetik üst yapılar uygulandı. Sinir bütünlüğü bozulan tarafta his kaybı devam etti ve sinir rejenerasyonu minimal düzeydeydi; bütünlüğü korunan tarafta iyileşme gözlemlendi.

SONUÇ: Mandibular bölgeye yerleştirilen implantların mandibular sinire penetrasyonu, nörosensoriyel komplikasyonların önemli bir nedeni olarak bilinmektedir. Literatürde, mandibular kanalın anatomik varyasyonları ve implant yerleştirme teknikleri nedeniyle sinir yaralanmaları bildirilmiş olup, bu yaralanmaların tamiri ve iyileşme süreci değişkenlik göstermektedir (1). Sinir bütünlüğünün korunması durumunda hastada duyusal iyileşmenin gözlenmesi, sinir yapısının invazyonunun tam transeksiyona kıyasla daha olumlu прогнозa sahip olduğunu desteklemektedir (2). İmplant yerleştirme öncesi detaylı radyolojik değerlendirme ve cerrahi sırasında dikkatli anatomik lokalizasyonun sağlanması kritik öneme sahiptir (3). Sonuç olarak, mandibular sinire invazyon riski taşıyan implant cerrahilerinde multidisipliner yaklaşım gereklidir.

ANAHTAR KELİMELER: Dental implant, İnför alveolar sinir, Parestezi, Sinir hasarı

Bilateral Hypoesthesia Due to Implants Placed in the Mandibular Nerve Canal and a Review of the Literature

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INTRODUCTION: Although dental implant surgery is generally a safe procedure, mandibular nerve injury is considered a rare but serious complication. Nerve penetration or compression, especially when the implant remains within the nerve canal for a prolonged period, can lead to permanent sensory disturbances. This case presents long-term bilateral hypoesthesia caused by implants penetrating the mandibular nerve canal and its surgical management.

CASE REPORT: A 67-year-old female patient presented to our clinic with bilateral numbness in the lower lip and chin region following the placement of a 6-unit dental implant in the mandibular region at an external center. The implants remained in place for 8 months, and symptoms did not resolve. Clinical examination revealed significant bilateral hypoesthesia. CBCT analysis showed that implants placed in the regions of teeth 36 and 46 had penetrated the mandibular nerve canal. These two implants were removed. During surgery, one side showed nerve discontinuity due to trauma, while the other side had preserved nerve integrity despite invasion. Prosthetic restorations were applied on the remaining four implants. Sensory loss persisted on the side with nerve discontinuity and minimal regeneration was observed; improvement occurred on the side where nerve integrity was preserved.

CONCLUSION: Implant penetration into the mandibular nerve canal is a known cause of neurosensory complications. According to literature, anatomical variations of the mandibular canal and implant placement techniques contribute to nerve injuries, with variable repair and recovery outcomes (1). Sensory improvement in the presence of preserved nerve integrity supports that nerve invasion without transection has a more favorable prognosis (2). Detailed radiological evaluation and precise anatomical localization during surgery are critical (3). A multidisciplinary approach is essential in implant surgeries with risk of mandibular nerve involvement.

KEYWORDS: Dental implant, Inferior alveolar nerve, Nerve injury, Pareesthesia

SS-081

DUDAK-DAMAK YARIĞI OLGULARINDA MAKİLLER RETROGNATİNİN DİSTRAKSİYON OSTEOGENEZİ İLE TEDAVİSİ

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ÖZET

Amaç: Bu olgu serisinin amacı, dudak-damak yarığına bağlı gelişen maksiller hipoplazilerin farklı distraksiyon teknikleri kullanılan yöntemleri ve elde edilen klinik sonuçları sunmaktır.

Olgu: Üç hasta dudak-damak yarığı öyküsü ve belirgin maksiller hipoplazi ile başvurdu. İki hastada ortodontist ile belirlenen bölgelerden yapılan vertikal kesiler sonrası archwise distraction appliance (AWDA) ile ilerletme tekniği uygulanırken, bir hastada RED (rijit eksternal distraktör) ile distraksiyon osteogenezi tercih edildi. Tüm hastalar sistemik olarak sağlıklı ve sendromsuzdu. Yapılan cerrahi işlemlerle maksillalar öne alınarak iskeletsel ve dental ilişkiler düzeltildi.

Sonuç: Farklı endikasyonlara göre seçilen cerrahi yöntemlerle üç hastada da fonksiyonel ve estetik açıdan tatmin edici sonuçlar elde edildi. Bu olgu serisi, dudak-damak yarığına bağlı maksiller hipoplazilerin yönetiminde AWDA ve RED ile yapılan distraksiyon osteogenezinin uygun endikasyonlarda etkili bir şekilde uygulanabileceğini göstermektedir.

1. GİRİŞ

Dudak damak yarığı, dünyada canlı doğumların yaklaşık 1/500 – 1/1000’inde görülen en yaygın konjenital kraniofasiyal anomalilerden biridir. (1) Bu hastalarda maksiller hipoplazi, primer defekte bağlı büyümeye bozuklukları ve erken dönemde yapılan yarık onarımlarının oluşturduğu skar dokusu nedeniyle sık görülen bir sekeldir. (2) Maksiller hipoplazi; orta yüz retrüzyonuna, ön ve arka çapraz kapanışlara ve dental ark deformasyonlarına yol açarak yüz estetiğini bozabilir; ayrıca çığneme ve konuşma fonksiyonlarında bozulmalar ve psikososyal sorunlar oluşturabilir. (3) Cleft hastalarında maksiller hipoplazinin tedavisi için çeşitli cerrahi yaklaşımlar tanımlanmıştır. Bu yaklaşımlar arasında segmental osteotomiler ve maksiller ilerletme prosedürleri yer almaktır, bunlar distraksiyon osteogenezi uygulanarak veya uygulanmadan gerçekleştirilebilir. (4) Cerrahi teknik seçimi; deformitenin şiddeti, dental ark ilişkileri ve ortodonti ile koordine edilen genel tedavi planına göre belirlenir. (5) AWDA, orta şiddetteki defisitlerde cerrahi invazivitenin düşük olması ve oklüzyonun kontrollü şekilde düzeltmesine olanak tanımışı nedeniyle avantajlıdır. (6) Bu olgu serisi, üç hastanın farklı endikasyonlarla AWDA ve RED ile yapılan distraksiyon osteogenezi yöntemlerini ve kısa dönem klinik sonuçlarını sunmaktadır.

2. OLGU RAPORLARI

Olgu-1

On yedi yaşında erkek hasta, dudak-damak yarığı öyküsü ve belirgin maksiller hipoplazi ile kliniğimize başvurdu. Sistemik olarak sağlıklı olan hastanın yapılan klinik muayenesinde orta yüz retrüzyonu ve iskeletsel sınıf III ilişki saptandı (Şekil-1). Ortodonti ile birlikte yapılan tedavi planlaması sonucunda, maksillanın sagittal yönde ilerletilmesine karar verildi. Hastaya AWDA ile anterior segmental osteotomi ve aperiiodik ilerletme tekniği uygulandı. Cerrahi sonrası aktif distraksiyon süreci tamamlandıktan sonra retansiyon fazına geçildi. Üç aylık postoperatif takiplerinde iskeletsel ve dental ilişkilerin stabil olduğu, estetik görünüm ve oklüzyonun tatmin edici düzeyde olduğu gözlemedi (Şekil-2). Komplikasyon izlenmedi. Hastanın fonksiyonel ve estetik sonuçlarının daha da iyileştirilmesi amacıyla ileri dönemde genioplasti yapılmıştır (Şekil-3).

Olgu-2

On dokuz yaşında erkek hasta, dudak-damak yarığı öyküsü ve belirgin maksiller hipoplazi ile kliniğimize başvurdu. Sistemik olarak sağlıklı olan hastanın yapılan klinik muayenesinde orta yüz retrüzyonu ve iskeletsel sınıf III ilişki tespit edildi (Şekil-4). Ortodontik değerlendirme ve planlama sonrasında maksiller ilerletme amacıyla AWDA (Archwise Distraction

Appliance) ile anterior segmental osteotomi ve aperiiodik ilerletme tekniği uygulandı. Cerrahi sonrası aktif distraksiyon fazının tamamlanmasının ardından retansiyon fazına geçildi. Dört aylık postoperatif takiplerde iskeletsel ve dental ilişkilerin stabil olduğu, yüz estetiğinin belirgin şekilde düzeldiği ve oklüzyonun fonksiyonel olarak tatmin edici olduğu gözlandı (Şekil-5). Komplikasyon raporlanmadı.

Olgu-3

On sekiz yaşında kadın hasta, dudak-damak yarığı operasyon öyküsü ve belirgin maksiller hipoplazi ile kliniğimize başvurdu. Sistemik olarak sağlıklı olan hastada yapılan klinik ve ortodontik değerlendirmelerde ciddi düzeyde orta yüz retrüzyonu ve iskeletsel sınıf III maloklüzyon tespit edildi (Şekil-6). İlerletme miktarının fazla olması nedeniyle bu hastada distraksiyon osteogenezi tercih edildi. Planlanan osteotomi kesileri sonrası distraktör yerleştirilerek kademeli olarak maksilla öne alındı (Şekil-7). Distraksiyon fazının ardından retansiyon sürecine geçildi. Postoperatif takiplerde iskeletsel ve dental ilişkilerin tatmin edici düzeyde olduğu, yüz estetiğinin belirgin şekilde düzeldiği ve oklüzyonun fonksiyonel olduğu gözlandı. (Şekil-8) Komplikasyon izlenmedi. Maksilla stabil konuma geldikten sonra hastaya sabit protetik restorasyon yapıldı ve hasta estetik görünümünden memnuniyet bildirdi. (Şekil-9)

3. TARTIŞMA

Dudak-damak yarığı hastalarında maksiller hipoplazi, primer defekte bağlı büyümeye bozuklukları ve cerrahi onarımların oluşturduğu skar dokusu nedeniyle sıkılıkla gözlenir. (3) Tedavi yaklaşımı hipoplazinin şiddetine, hastanın yaşına, dental ark ilişkilerine ve ortodontik hazırlığa göre belirlenir. Bu olgu serisinde iki hastada AWDA ile anterior segmental osteotomi ve aperiiodik ilerletme tekniği uygulanmış, bir hastada ise distraksiyon osteogenezi tercih edilmiştir. AWDA, orta düzeyde maksiller ilerletme gerektiren olgularda avantaj sağlar; cerrahi olarak daha minimal invazivdir ve bölünmüş segmentlerin hareket etmesi sayesinde oklüzyonun daha kontrollü düzeltilmesine olanak tanır. (7) Ayrıca sabit protetik planlaması yapılacak hastalarda segmentlerin birbirine yaklaşırılmasını sağlar ve mevcut dişsiz alveol kretine komşu oronazal açıklıkların kapatılmasına yardımcı olabilir. (8) AWDA'nın bir diğer avantajı, operasyon süresinin RED distraktöre göre daha kısa olmasıdır. Bununla birlikte AWDA ağız içinde uzun süre kalan bir apareydir ve apareyin proksimalinde ve bukkal sulkusun posterioründe ilerletme mesafesi kadar tel uzatılması gerektiği için hastada rahatsızlık oluşturabilir. RED (Rigid External Distractor) ise uygulanan Le Fort kesilerinin yüksekliğine göre segmentlerin ilerletme miktarını ayarlama imkânı verir, ağız içinde fazlalık oluşturmaz, yumuşak doku adaptasyonuna olanak tanıldığı için relaps riskini azaltır ve velofarengeal boşluğun artısına bağlı gelişebilecek konuşma veya solunum sorunlarını kontrol etme açısından cerraha ek bir ayarlama imkânı sunar. (9) Ancak maliyet açısından AWDA'ya göre daha yüksektir. Dolayısıyla, iki yöntem arasında seçim yapılrken ilerletme miktarından ziyade hastanın ağız içi toleransı, ortodontik ve protetik tedavi planlaması, velofarengeal fonksiyonlar, relaps riski, maliyet ve hastanın genel sağlık durumu göz önünde bulundurulmalıdır. Bu olgu serisinde hasta bazlı endikasyonlarla seçilen yöntemlerin her birinde iskeletsel ve dental ilişkiler stabil bulunmuş ve estetik açıdan tatmin edici sonuçlar elde edilmiştir.

4. SONUÇ

Bu olgu serisi, dudak-damak yarığına bağlı maksiller hipoplazilerin tedavisinde hasta bazlı cerrahi planlamaların önemini vurgulamaktadır. Orta şiddetteki vakalarda AWDA ve aperiiodik ilerletme tekniği ile tatmin edici fonksiyonel ve estetik sonuçlar elde edilebilirken, ileri düzey hipoplazilerde distraksiyon osteogenezi güvenli ve stabil bir seçenek sunmaktadır. Farklı cerrahi yaklaşımın uygun endikasyonlarda kullanılması ile hem oklüzal ilişkiler hem de yüz estetiği başarılı şekilde restore edilebilmektedir. Daha uzun süreli takiplerle bu yöntemlerin iskeletsel stabilité ve relaps oranları üzerine etkileri değerlendirilmelidir.

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SS-083

BIOMECHANICAL EVALUATION OF PLATES WITH VARYING THICKNESS IN SEGMENTAL MANDIBULAR DEFECTS: A PRELIMINARY STUDY

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Objective: The aim of this study was to investigate the biomechanical stability of locking reconstruction plates with different profile thicknesses, used in the reconstruction of lateral segmental mandibular defects, under incisal loading in both grafted and non-grafted conditions. **Materials and Methods:** Twenty polyurethane mandibles (N=20) were fabricated by molding a demonstrational model. A standardized 5.5 cm lateral segmental defect was created in each specimen, extending from the distal of the right canine to the distal of the right second molar. Specimens were randomly allocated into four groups (n=5): LP (2.0 mm low-profile plate), LPg (2.0 mm low-profile plate + graft), HP (2.5 mm high-profile plate), and HPg (2.5 mm high-profile plate + graft). Fixation was performed using 2.4 mm L-shaped locking reconstruction plates and 2.4 mm diameter, 10 mm length locking screws, with three screws per mandibular segment. In graft groups (LPg and HPg), a 5.0 cm × 1.5 cm polyurethane segment was adapted to simulate a fibula graft and stabilized with three additional screws through the plate. All specimens underwent progressive uniaxial incisal loading from 10 N to 250 N using a universal testing machine, with load-displacement curves recorded at 10 N intervals. Statistical analysis was performed using one-way ANOVA, with post hoc comparisons by Tukey or Tamhane T2 tests depending on variance homogeneity. The significance level was set at $p<0.05$.

Results: No significant differences were observed up to 80 N. From 90 N to 250 N, a significant difference was found only between the HPg and HP groups ($p<0.05$). No other pairwise comparisons reached significance.

Conclusion: Within the limitations of this study, it may be concluded that graft placement does not influence the stability of low-profile fixation systems, whereas in high-profile systems, the addition of a graft is more likely to be associated with increased displacement compared to graft-free constructs under incremental incisal loading.

Keywords: biomechanical stability, mandibular segmental defect, reconstruction plate

1. INTRODUCTION

Segmental mandibular defects represent one of the most demanding conditions in oral and maxillofacial surgery, as they are frequently associated with loss of mandibular continuity, impaired mastication, speech dysfunction, and significant facial deformity. Such defects commonly arise after ablative tumor surgery, trauma, or osteoradionecrosis and often require complex reconstructive strategies (1,2). The evolution of mandibular defect classification systems, beginning with Urken et al. (1991) and Boyd et al. (1993) and later refined by Schultz et al. (2013) and Brown et al. (2016), consistently demonstrates that both the dimension and anatomical location of the defect are fundamental factors guiding the optimal reconstructive strategy. The evolution of mandibular defect classification systems, beginning with Urken et al. (1991) and Boyd et al. (1993) and later refined by Schultz et al. (2013) and Brown et al. (2016), consistently demonstrates that both the dimension and anatomical location of the defect are fundamental factors guiding the optimal reconstructive strategy. (1,3-5). Lateral segmental defects involving the mandibular body and angle, with preservation of the condyle, are among the most frequently encountered clinical scenarios and remain a central focus of reconstructive research (6-9). The primary goals of mandibular reconstruction are to restore continuity, ensure adequate function, and re-establish facial aesthetics. A variety of reconstructive methods have been proposed, ranging from non-vascularized bone grafts to microvascular free tissue transfer. Among these, the fibula free flap has become the most widely applied option due to its favorable dimensions, reliable bone stock, and ability to undergo multiple osteotomies for contouring (7- 12).

Reconstruction plates play an important role in mandibular continuity restoration, especially in the early postoperative phase before bony union is achieved. Locking plate systems have gained increasing preference because they provide angular stability, reduce screw loosening, and allow load sharing between the plate and the bone segments (9,13,14). However, these plates differ in terms of design and profile thickness, which can significantly influence

their biomechanical performance. While high-profile plates are generally assumed to confer greater rigidity and load-bearing capacity, their stiffness may also create stress concentration at the screw–plate–bone interface, potentially increasing displacement or hardware complications (16, 17). Conversely, low-profile plates may provide a more favorable stress distribution, but this comes at the expense of reduced resistance under higher functional loads (8,15- 18).

Considering the critical nature of these biomechanical considerations, standardized in vitro models offer the necessary platform for reproducible testing of fixation systems under controlled and clinically relevant conditions. Such in vitro approaches allow reproducible evaluation of load–displacement behavior under defined forces that approximate physiologic conditions (13,14,16,18). Therefore, this study was designed to investigate and compare the load–displacement characteristics of reconstruction plates with two distinct profile thicknesses, applied both with and without a fibula-mimicking graft, in a standardized lateral mandibular segmental defect model.

2. MATERIALS AND METHODS

Twenty polyurethane mandibular models were fabricated (Sirius Polyurethane Resin, Sirius Co, Ankara, Turkey) by molding a previously prepared demonstrational model (RTV2 Molding Silicone, Armagan Painting Co, Istanbul, Turkey). All mandibles were intact, enabling standardized simulation of occlusal loading. A lateral segmental defect was created in each specimen using predetermined resection lines. The superior margin of the defect measured 4.5 cm and the basal margin 5.5 cm. Resection started 1.5 cm anterior to the mandibular angle and proceeded towards a point marked at the distal aspect of the second molar. The line connecting these two points formed an angle of approximately 60° with a line drawn parallel to the occlusal plane. Distally, the resection line terminated at the distal aspect of the second molar, while mesially it extended from a vertical line drawn at 90° immediately distal to the canine. The bone between these defined lines was resected, yielding a standardized lateral segmental defect. Standardization was maintained as all resections and

plate fixations were performed by the same surgeon.

The specimens were randomly divided into four groups, stratified by plate profile thickness and graft placement. All groups utilized L-shaped locking reconstruction plates (Medplates, Ramed Medical Co., Izmir, Turkey) and a 2.4 mm diameter locking screw system. In the two Low-Profile (LP) groups, a 2.0 mm low-profile plate was used, either alone (LP) or combined with a fibula-mimicking graft (LPg) (Fig.1). Similarly, in the two High-Profile (HP) groups, fixation was achieved with a 2.5 mm high-profile plate, either without graft (HP) or with graft (HPg) (Fig 2). For the graft groups (LPg and HPg), a polyurethane segment was prepared to simulate a fibula graft. Each graft measured 5.0 cm in length, 1.5 cm in height, 5.0 cm at the superior margin, 5.3 cm at the basal margin, and 1.0 cm in thickness. The fixation protocol was consistent across all groups: 10 mm locking screws (Medplates, Ramed Medical Co., Izmir, Turkey) were used, with three screws placed on each mandibular segment. When a graft was present, three additional screws were applied through the plate to secure the graft to the native segments.

All mandibular constructs were mounted on a universal testing machine (Shimadzu Autograph AG-IS, Shimadzu, Kyoto, Japan). Progressive uniaxial loading was applied continuously in the incisal region at a constant crosshead speed of 1 mm/min, beginning at 10 N and increasing stepwise up to 250 N. Load–displacement curves were continuously recorded throughout the process, and displacement values were specifically documented at every 10 N increment (Fig. 3).

All data were analyzed using SPSS software (IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY, USA) with a 95% confidence interval. The Shapiro–Wilk test was used to assess normality of data distribution. Homogeneity of variances was evaluated with Levene's test. When assumptions of normal distribution and variance homogeneity were met, group comparisons were performed using one-way analysis of variance (ANOVA) followed by Tukey's post hoc test. In cases where homogeneity of variances was not confirmed, Tamhane's T2 test was applied. A p-value <0.05 was considered statistically significant.

3. RESULTS

All specimens completed the progressive incisal loading up to 250 N without mechanical failure. Load-displacement curves were obtained for each construct, and displacement values were documented at every 10 N increment. Comparisons revealed no statistically significant differences among groups up to 80 N ($p>0.05$). However, beginning at 90 N and extending through 250 N, a statistically significant difference was observed only between the high-profile plate with graft (HPg) group and the high-profile plate without graft (HP) group ($p<0.05$). The HPg group consistently demonstrated greater displacement than the HP group at each 10 N increment within this range. No other pairwise group comparisons yielded statistically significant differences (Table 1). Furthermore, within-group analyses indicated that displacement values increased significantly with each 10 N load increment across all groups ($p<0.05$).

4. DISCUSSION

The reconstruction of lateral mandibular segmental defects remains a challenging issue in maxillofacial surgery, as both biomechanical stability and functional restoration must be achieved. To provide a reproducible and clinically relevant assessment, this study employed a standardized unilateral defect extending from the distal canine to the distal second molar while preserving the condyle—an anatomical configuration frequently encountered after tumor ablation or trauma. According to the classifications proposed by Urken et al. (3) and Brown et al. (1), the defect created in this study corresponds to a lateral continuity defect with condyle preservation.

A resection length of 5.5 cm was chosen to ensure clinical relevance and to match dimensions reported for fibula-based reconstruction (5,7,10). This distance allows sufficient span for fixation and generates bending moments comparable to those measured in finite element analyses and experimental setups of similar configurations (13,18). All specimens were fixed using 2.4 mm L-shaped locking reconstruction plates, a well-established system for continuity.

restoration, differing only in plate thickness (2.0 mm low-profile vs. 2.5 mm high-profile). Each segment was stabilized with three 2.4×10 mm locking screws, consistent with previous biomechanical studies employing comparable defect spans and reconstruction plate configurations (14,15).

The applied load protocol simulated incisal bite forces to represent anterior functional loading. Human incisal forces typically range from 100 to 250 N, while molar loads can exceed 500 N (19-21). A loading limit of 250 N was therefore selected to reproduce the upper physiological boundary of anterior masticatory forces without exceeding clinically relevant limits. Similar magnitudes were used in previous reconstruction studies evaluating plate stiffness and displacement behavior (7,14,20). Thus, the loading and testing conditions reflected realistic functional forces observed *in vivo*, and the resulting load–displacement responses aligned with established biomechanical models of mandibular flexure, supporting the reliability of the experimental design.

From a biomechanical perspective, the mandible acts as a curved beam subjected to complex deformation under occlusal loading. During incisal force application, the superior border experiences tensile stress, whereas the inferior border is subjected to compression, generating sagittal bending moments (22,23). In condyle-preserving lateral defects, the intact condylar articulation alters the distribution of bending moments and stress patterns along the remaining mandibular segment (24, 25). Moreover, mandibular flexure generates combined bending and torsional effects, producing multidirectional stress fields at the graft–plate–screw interface (23). These simultaneous bending and twisting forces explain the non-uniform displacement behavior observed among different plate and graft configurations.

In this study, all fixation types provided comparable stability under low to moderate loads ($\leq 80\text{N}$), indicating that both plate profiles ensured adequate baseline rigidity for early functional loading. However, as loading increased to 90–250 N, significant differences emerged between the high-profile plate with graft (HPg) and without graft (HP). The high-profile plates, due to

their greater stiffness, transferred higher stress concentrations to the graft–plate–screw interface, resulting in greater displacement under elevated forces. This finding is consistent with Kasper et al. (14) and Hoefert et al. (17) who reported that excessive rigidity may lead to localized stress concentration at screw holes and plate junctions. In contrast, low-profile plates exhibited slightly greater flexibility, promoting more uniform stress distribution and reducing the impact of graft incorporation on overall construct behavior. This observation aligns with Rudderman et al. (26), who noted that moderately elastic systems dissipate mechanical energy more effectively than overly rigid ones. The findings indicate that plate thickness and graft incorporation influence how stresses are transferred within the reconstructed segment. High-profile plates provided greater stiffness but also produced higher stress concentrations at the plate–screw–graft interface under elevated loads. Low-profile plates, being slightly more flexible, allowed a more uniform stress distribution. These observations highlight the mechanical balance between rigidity and elasticity within the fixation system, which determines overall construct behavior under functional loading.

The load–displacement curves obtained in this study followed a pattern consistent with previous reports—an initial linear phase under low loads followed by increased deformation beyond 150–200 N, corresponding to the onset of microstrain within the plate–screw complex (7,14). This behavior reflects the physiological flexure threshold of the mandible (20,23), further supporting that the applied forces accurately replicated functional conditions. The use of polyurethane mandibles provided standardized geometry and material uniformity, eliminating variability in bone density or anatomy and allowing controlled comparison of fixation performance.

Several limitations should be acknowledged. Although polyurethane models allow reproducible mechanical testing, they do not replicate the anisotropic, viscoelastic, or remodeling properties of living bone. Biological factors such as muscle activity, bone healing, and dynamic mandibular motion were not represented. The graft segments mimicked fibula geometry but lacked the biological integration and elasticity of vascularized bone, which could

affect stress transfer *in vivo*. Additionally, the sample size may limit statistical power.

5. CONCLUSION

Within the limitations of this *in vitro* study, it may be concluded that plate thickness plays a critical role in the biomechanical stability of lateral mandibular reconstructions. The addition of a graft did not consistently improve construct stability, and in the case of high-profile plates, it was associated with greater displacement. These findings indicate that both the choice of plate profile and the adaptation between the graft and fixation system should be carefully considered when planning mandibular reconstruction.

6. REFERENCES

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7. FIGURES



Figure 1: Lateral view of a mandibular defect reconstructed with a low-profile plate



Figure 2:Lateral mandibular defect reconstructed with a high-profile L-shaped plate and a fibula-mimicking graft



Figure 3: Mandibular reconstruction model with a high-profile plate and fibula-simulating graft positioned for biomechanical testing

8. TABLES

Table 1: Displacement measurements under incisal loading

Force Magnitude	LP (Mean ± SD mm)	LP+g (Mean ± SD mm)	HP (Mean ± SD mm)	HP+g (Mean ± SD mm)	p-value
10 N	0.09±0.06	0.03±0.01	0.02±0.009	0.08±0.05	0.058
20 N	0.15±0.08	0.11±0.07	0.06±0.02	0.19±0.09	0.084
30 N	0.24±0.11	0.20±0.13	0.11±0.04	0.28±0.12	0.163
40 N	0.33±0.13	0.26±0.15	0.17±0.06	0.35±0.14	0.160
50 N	0.41 ± 0.15	0.32 ± 0.17	0.22 ± 0.07	0.43 ± 0.15	0.140
60 N	0.47 ± 0.17	0.38 ± 0.17	0.26 ± 0.05	0.48 ± 0.17	0.098
70 N	0.52 ± 0.18	0.43 ± 0.17	0.30 ± 0.09	0.59 ± 0.19	0.078
80 N	0.57 ± 0.19	0.48 ± 0.18	0.34 ± 0.09	0.65 ± 0.19	0.062
90 N	0.62 ± 0.19	0.53 ± 0.20	0.37 ± 0.08 A	0.70 ± 0.22 a	0.048
100 N	0.68 ± 0.20	0.60 ± 0.22	0.41 ± 0.08 A	0.77 ± 0.23 a	0.040
110 N	0.73±0.21	0.66±0.20	0.47±0.11A	0.87±0.22a	0.035
120 N	0.78±0.21	0.72±0.21	0.51±0.12A	0.94±0.23a	0.030
130 N	0.82 ± 0.21	0.77 ± 0.23	0.52 ± 0.10 A	0.94 ± 0.25 a	0.026
140 N	0.87±0.21	0.83±0.24	0.60±0.13A	1.08±0.25a	0.021
150 N	0.91±0.21	0.89±0.26	0.64±0.13A	1.15±0.25a	0.020
160 N	0.96 ± 0.21	0.94 ± 0.27	0.68 ± 0.13 A	1.22 ± 0.26 a	0.017
170 N	1.00±0.22	1.00±0.29	0.72±0.13A	1.29±0.26a	0.015
180 N	1.04±0.22	1.06±0.31	0.76±0.14A	1.36±0.27a	0.013
190 N	1.09 ± 0.23	1.11 ± 0.32	0.80 ± 0.14 A	1.43 ± 0.28 a	0.012
200 N	1.14±0.24	1.17±0.34	0.84±0.14A	1.50±0.29a	0.011
210 N	1.18±0.24	1.22±0.16	0.88±0.14A	1.57±0.29a	0.010
220 N	1.23 ± 0.25	1.28 ± 0.37	0.92 ± 0.14 A	1.63 ± 0.30 a	0.010
230 N	1.28±0.26	1.33±0.38	0.96±0.15A	1.70±0.31a	0.009
240 N	1.32±0.27	1.38±0.39	1.00±0.15A	1.76±0.31a	0.009
250 N	1.43 ± 0.28	1.44 ± 0.41	1.06 ± 0.15 A	1.83 ± 0.32 a	0.009

Mean and standard deviation (SD) values of the displacement data measured in the incisal loading groups stratified by the levels of force. Values followed by the uppercase letter A were significantly different ($p < 0.05$) from their lowercase counterparts written in the same row (N: Newton, LP: Low Profile Plate without graft, LP+G: Low Profile Plate with Graft, HP: High Profile Plate without graft, HP+G: High Profile Plate With Graft).

SS-089

**PECTORALIS MAJOR MYOCUTANEOUS FLAP FOR SALVAGE OF PLATE EXPOSURE AND
OROCUTANEOUS FISTULA IN ANTERIOR MANDIBULAR MRONJ: A CASE REPORT AND LITERATURE
REVIEW**Mehmet İĞNECİ^a, Aras ERDİL^bA- TR Ministry of Health, Uşak Dental and Oral Health Center, Department of Oral and Maxillofacial Surgery, UŞAK/TÜRKİYE, dt.mehmet.igneci@gmail.comB- Uşak University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, UŞAK/TÜRKİYE, aras.erdil@usak.edu.tr**Abstract**

Objective: Reconstruction plate exposure and orocutaneous fistula are major postoperative complications following segmental mandibular resection, particularly in patients with medication-related osteonecrosis of the jaw (MRONJ). This report presents the successful salvage of plate exposure using a pectoralis major myocutaneous (PMMC) flap in a high-risk MRONJ patient and reviews relevant literature.

Case Report: An 81-year-old male developed plate exposure and an orocutaneous fistula following anterior mandibular segmental resection for MRONJ. Exploration revealed detachment of the genioglossus and geniohyoid muscles from the reconstruction plate. These were re-anchored to restore tongue and hyoid support, followed by harvesting of a PMMC flap. A portion of the flap was deepithelialized to obliterate dead space and reinforce fistula closure. The flap provided durable coverage, eliminated salivary leakage, and restored separation between the oral cavity and cervical tissues. No recurrence of fistula or plate exposure was observed during follow-up.

Conclusion: The PMMC flap remains a reliable salvage option for hardware exposure in medically complex MRONJ patients when free tissue transfer is not feasible. Re-anchoring of the suprathyroid musculature may further enhance functional stability and reduce recurrence risk.

Key Words: Mandibular reconstruction, plate exposure, MRONJ, PMMC flap, orocutaneous fistula

1. Introduction

Reconstruction plate exposure is a frequent complication after mandibular reconstruction and is reported in 12–25% of cases, with overall hardware-related complication rates reaching 20–25% (1). Anterior mandibular defects pose an especially high risk due to tension at the midline, limited soft-tissue bulk, and dependence on muscular attachments to maintain functional stability (2). In patients with MRONJ, compromised vascularity, infection, systemic comorbidities, and delayed healing further increase susceptibility to fistula formation, exposure, and fixation failure (3).

Although microvascular free tissue transfer is the gold standard for mandibular reconstruction, salvage situations often involve irradiated, scarred, or medically fragile patients in whom free flap options are limited. In such contexts, the pectoralis major myocutaneous (PMMC) flap continues to serve as a dependable reconstructive tool. Its robust vascularity, muscle bulk, and reliable arc of rotation provide effective separation of the oral and cervical compartments and allow reinforcement of compromised soft-tissue envelopes (4).

This report describes the use of a PMMC flap for salvage of plate exposure and fistula in a high-risk MRONJ patient and emphasizes the importance of restoring suprathyroid muscle attachments—an often overlooked component of functional stability following anterior mandibular reconstruction.

2. Case Report

An 81-year-old male underwent anterior mandibular segmental resection for stage 3 MRONJ (Figure 1, 2A-C). The initial reconstruction involved placement of a titanium reconstruction plate (Figure 2D, 3B). The early postoperative period was uneventful; however, at approximately 4 weeks, the patient developed salivary leakage through the submental region. Clinical examination revealed orocutaneous fistula and plate exposure (Figure 4).

The patient was referred for salvage surgery. During exploration, the reconstruction plate was found partially exposed with surrounding soft-tissue thinning (Figure 5A). Importantly, both the genioglossus and geniohyoid muscles were noted to be detached from the plate, lying retracted over the scarred soft-tissue bed (Figure 5B). This detachment likely contributed to inferior tongue sagging, increased dead space, persistent contamination, and fistula formation.

After debridement of devitalized tissue, the genioglossus and geniohyoid muscles were re-anchored to the reconstruction plate using non-resorbable sutures to recreate anterior tongue and hyoid support (Figure 5C). A left-sided PMMC flap was designed. The skin paddle was tailored to the defect dimensions, and a segment of the flap was deepithelialized to obliterate dead space and reinforce closure of the fistula tract (Figure 5D).

The flap was tunneled to the cervical region and inset without tension. The muscle bulk provided adequate separation between the oral cavity and neck. A suction drain was placed, and the skin paddle was positioned externally for monitoring (Figure 6).

Postoperative recovery was uneventful. No salivary leakage or wound breakdown occurred. Oral intake was initiated gradually. At follow-up, the flap remained viable, with complete resolution of the fistula and no recurrence of plate exposure (Figure 7-8).

3. Discussion

Plate exposure following mandibular reconstruction represents a multifactorial problem, with risk factors including anterior location, inadequate soft-tissue coverage, tension, infection, radiation, smoking, and systemic comorbidities. MRONJ amplifies these risks through impaired bone turnover and chronic inflammation (1, 2, 3).

In salvage scenarios, the PMMC flap offers several advantages: reliable axial vascularity, substantial muscle bulk, rapid harvest, and avoidance of microvascular anastomosis. Published series report flap-related complication rates of 16–40%, but total flap loss remains low. The flap remains particularly valuable for elderly or comorbid patients and in settings involving contamination or fistula (5, 6).

The literature search on the present case yielded 171 articles. Ninety-five studies were excluded, including cadaveric studies, histological reports, laryngectomies, radiologic studies, animal studies, and 12 studies not in English or Turkish, for a total of 107 studies. When the remaining 64 studies were examined, current knowledge about PMMC flap was discussed in the rest of the section.

Indications for the PMMC flap were evaluated under two subheadings: primary reconstruction and salvage reconstruction. Indications for the PMMC flap included a history of neck radiotherapy (>60 Gy), uncontrolled diabetes, systemic vascular sclerosis, ASA 3 and 4 patients, patients over 75 years of age, major vessel preservation, exhausted neck syndrome, and total glossectomy. Flap failure, fistula formation, and carotid rupture were indications for salvage reconstruction. The PMMC flap offers the advantages of easy retrieval, a large volume of soft tissue, the ability to use a large skin island, high reliability, relatively short operative time, and versatility. On the other hand, it also has disadvantages such as the possibility of deformity in the chest wall, causing excessive soft tissue contour in some cases, causing dysfunction in the neck and shoulder, the possibility of partial necrosis in the skin island, and functional incompatibilities in the recipient area (6).

If we evaluate the complications of PMMC flap, especially after radiotherapy and secondary PMMC flap operations; partial flap necrosis (1.72% - 30%), total flap necrosis (0.7% - 12%), pharyngocutaneous fistulas (highest 14% 0 - 14%), orocutaneous fistulas (highest 27% 0 - 27%), hematoma (highest 7% 0 - 7%), infection (highest 24.1% 0 - 24.1%) and flap dehiscence (highest 16% 0 - 16%) (6). The PMMC flap is still a highly preferred flap today due to its pedicle-based technique, its reliability and durability, its reliability as a reliable option for patients with advanced stages or comorbidities, its suitability as a pedicled flap for use in patients with weakened necks, and the decreasing number of head and neck reconstruction cases in the field of plastic surgery (6-8).

In the present case, detachment of the genioglossus and geniohyoid muscles emerged as a key finding. These muscles are essential for tongue posture, anterior support, and airway protection (9, 10). Their detachment

increases dead space and limits soft-tissue stability over the reconstruction plate. Re-anchoring them likely reduced the risk of recurrent fistula and improved long-term functional outcomes (11).

Although free flaps provide superior aesthetic and functional outcomes, especially with bony reconstruction, PMMC remains a vital salvage modality in resource-limited or high-risk conditions. In MRONJ patients—who often present with medical fragility, infection, and compromised vascularity—its reliability is particularly advantageous (7).

4. Conclusion

The PMMC flap is an effective salvage technique for managing plate exposure and orocutaneous fistula following anterior mandibular reconstruction in MRONJ patients. Addressing soft-tissue deficiencies, obliterating dead space, and restoring suprathyroid muscle attachments are critical to preventing recurrence. When free tissue transfer is contraindicated or not feasible, PMMC provides a safe and practical reconstructive solution.

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6. Figures

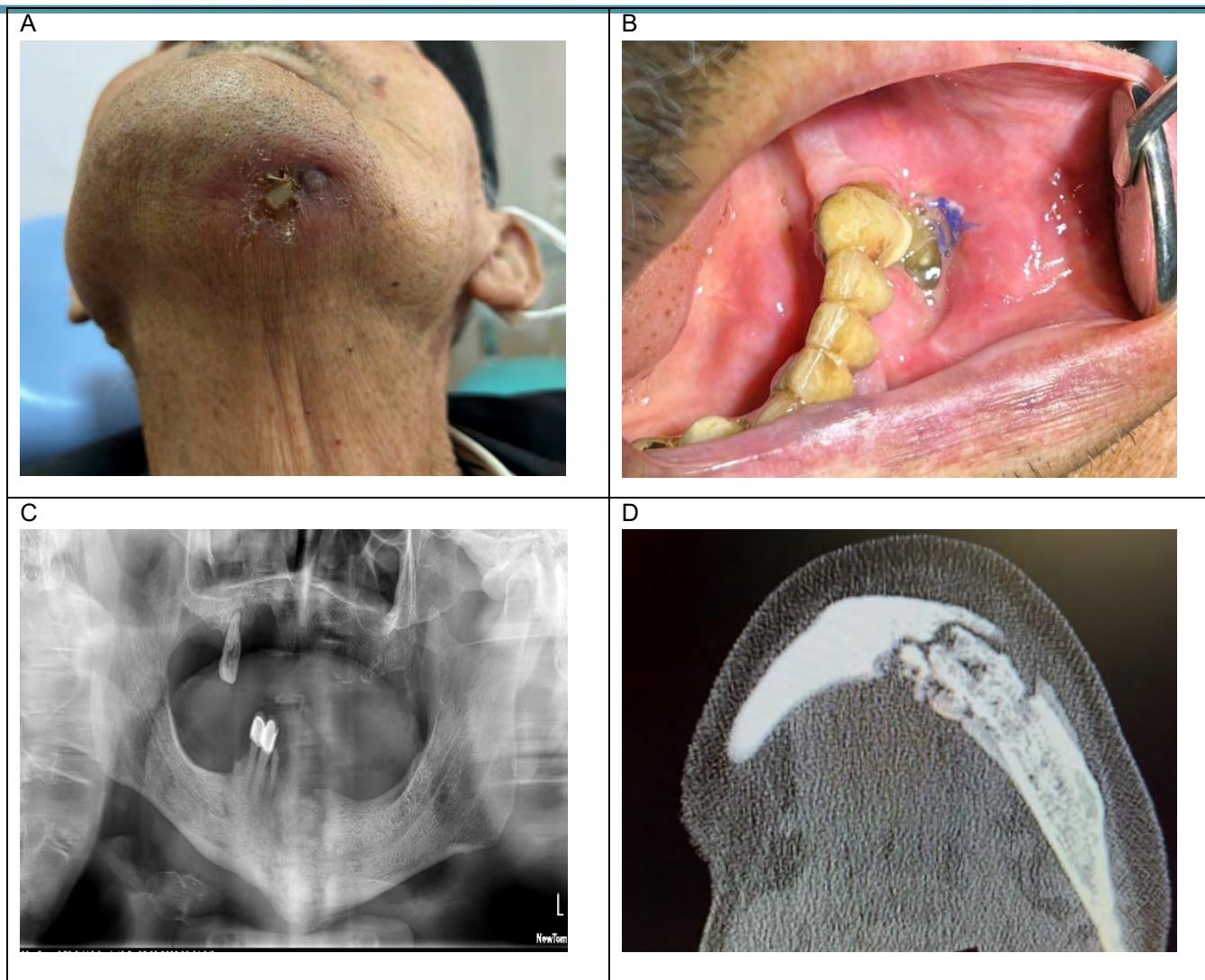
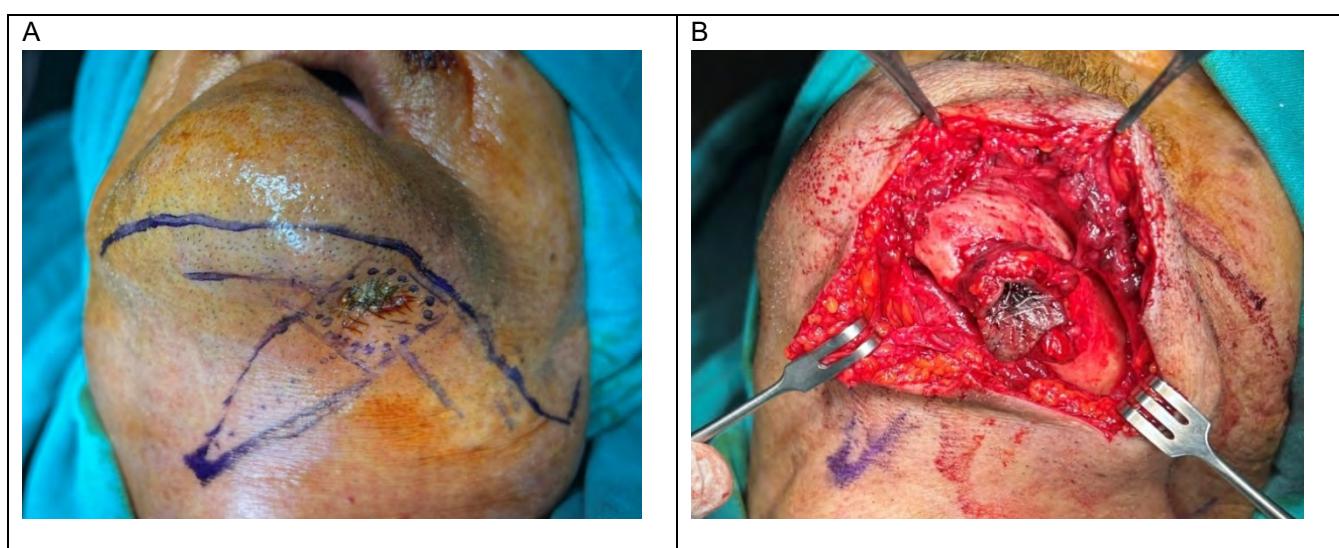


Figure 1: A: Preoperative clinical image of the extraoral fistula, B: Preoperative clinical image of the intraoral fistula, C: Preoperative view of panoramic radiography, D: Preoperative view of the lesion on computed tomography (CT) slide



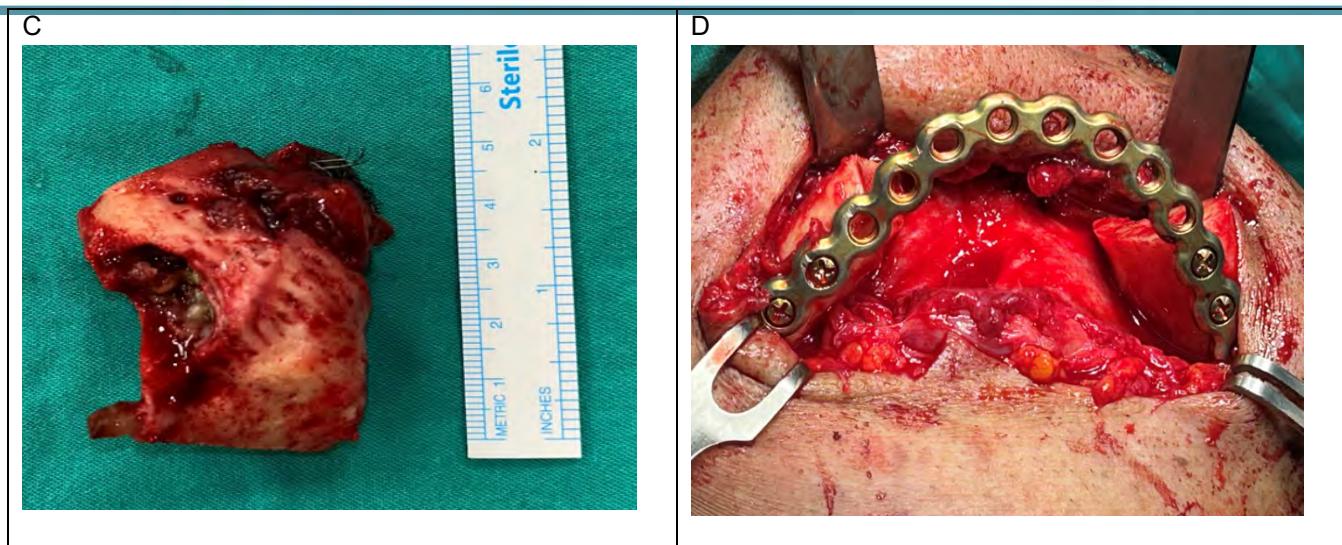


Figure 2: A: Determination of the extraoral incision line (Submental approach), B: Intraoperative view of the mandibular base, C: Excised specimen with fistula tract, D: Rigid fixation of the mandible with reconstruction plate (RC)

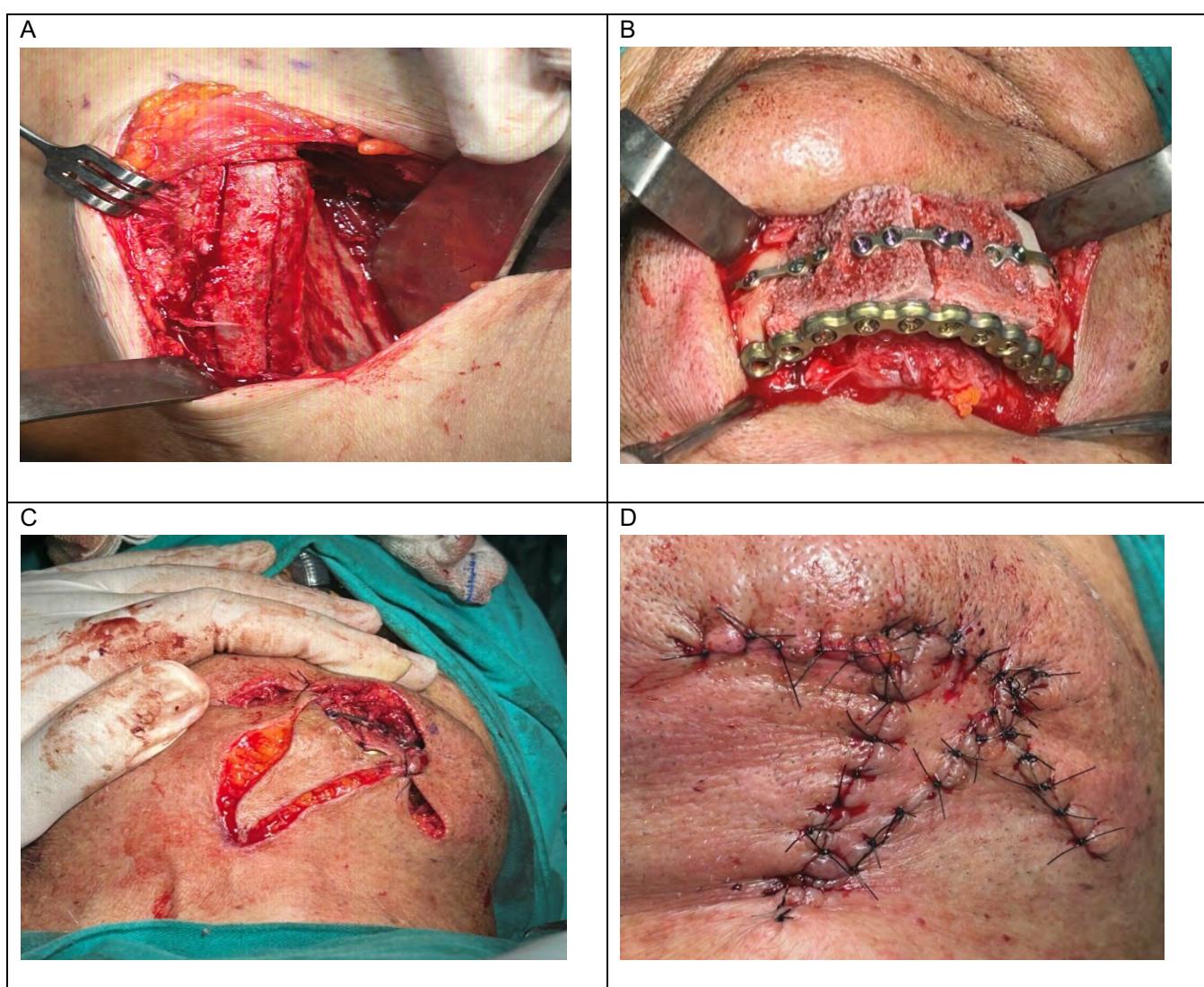


Figure 3: A: Left iliac crest, B: Iliac crest grafts in place, fixated with miniplates and screws and fixated to the reconstruction plate, C: V-Y Advancement Flap incision lines, D: Defect repair with V-Y advancement flap

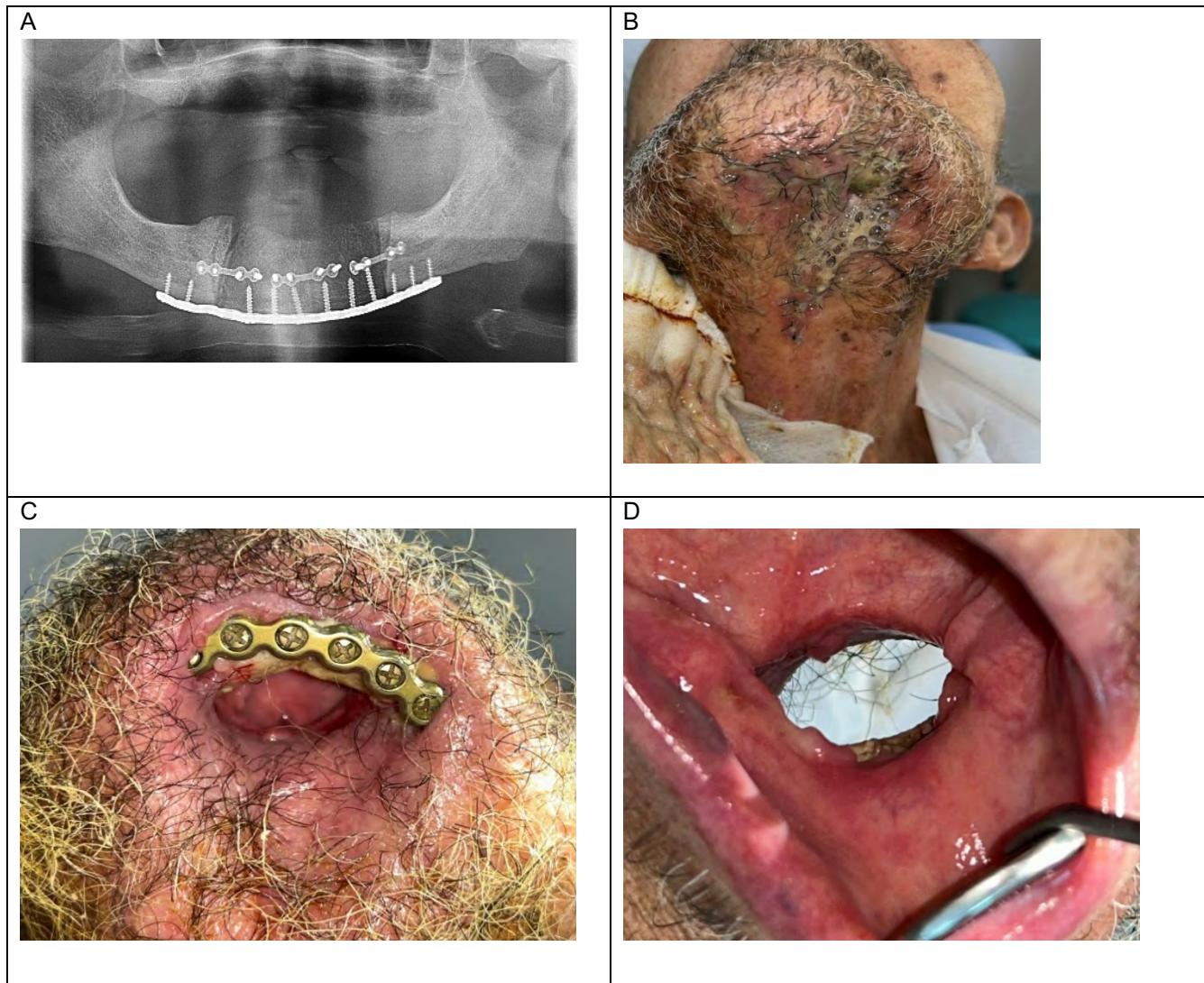


Figure 4: A: Postoperative OPG, B: Postoperative 3rd week and suppuration, C: Postoperative 8th week (exposure reconstruction plate and formation of orocutaneous fistula), D: Postoperative 8th week orocutaneous fistula (view from oral cavity)

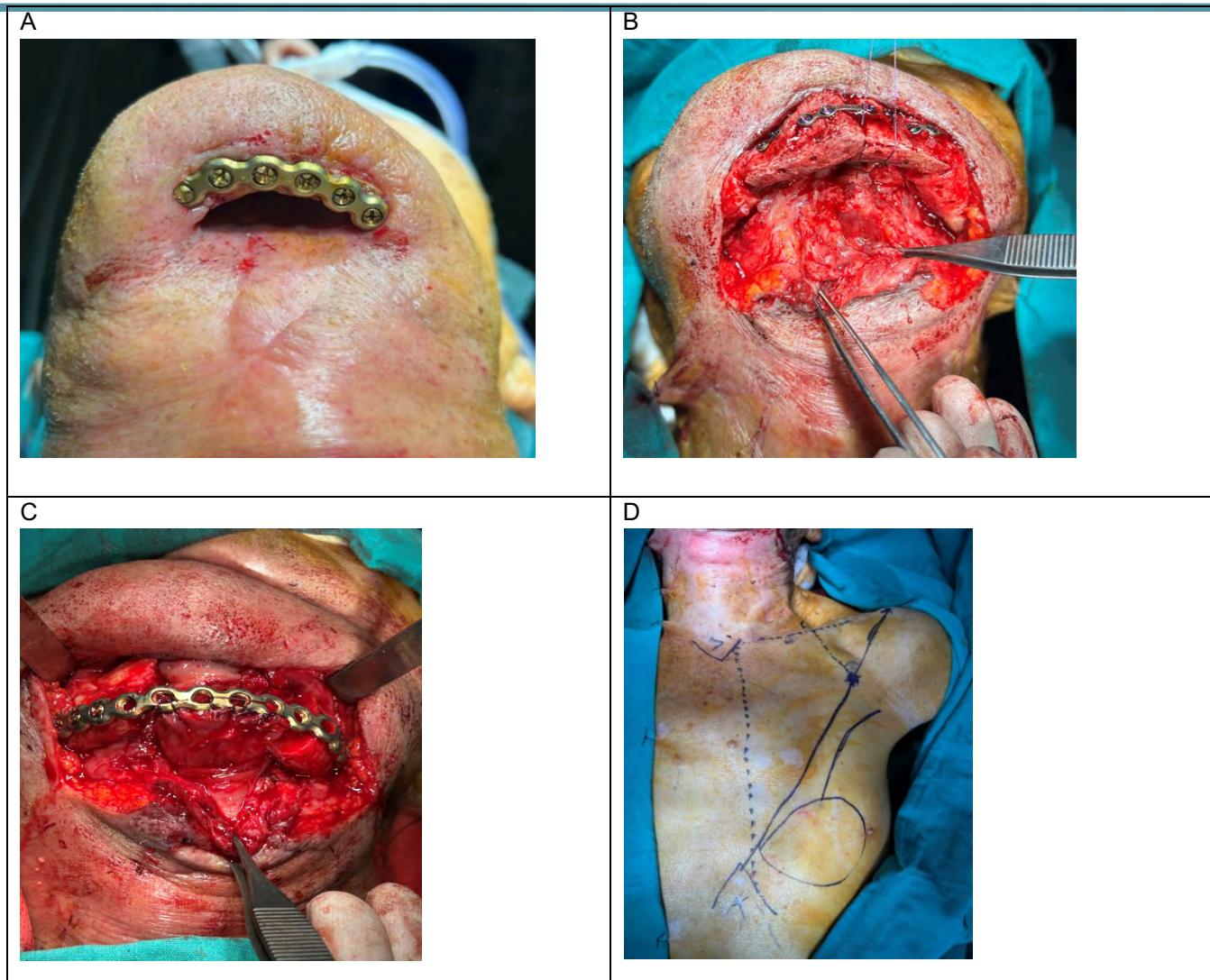
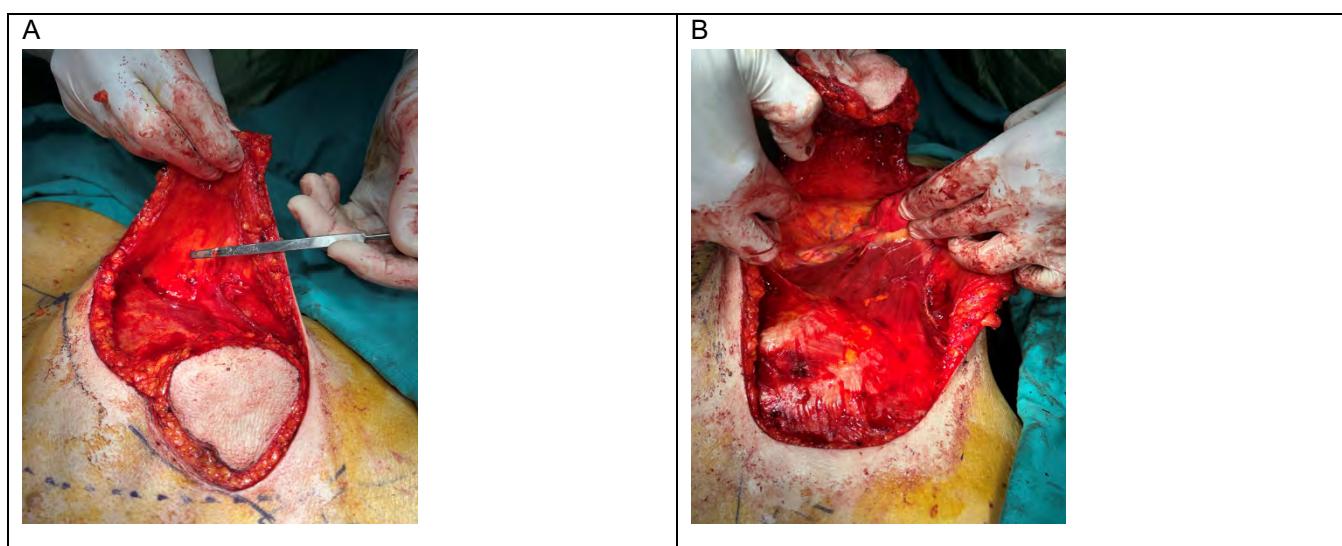


Figure 5: A: Second operation, exposure following reconstruction plate exposure and orocutaneous fistula formation, B: Dissection of the genioglossus and geniohyoideus muscles, C: Suturation of the genioglossus and geniohyoideus muscles to the reconstruction plate. D: Skin markings of PMMC flap incision lines.



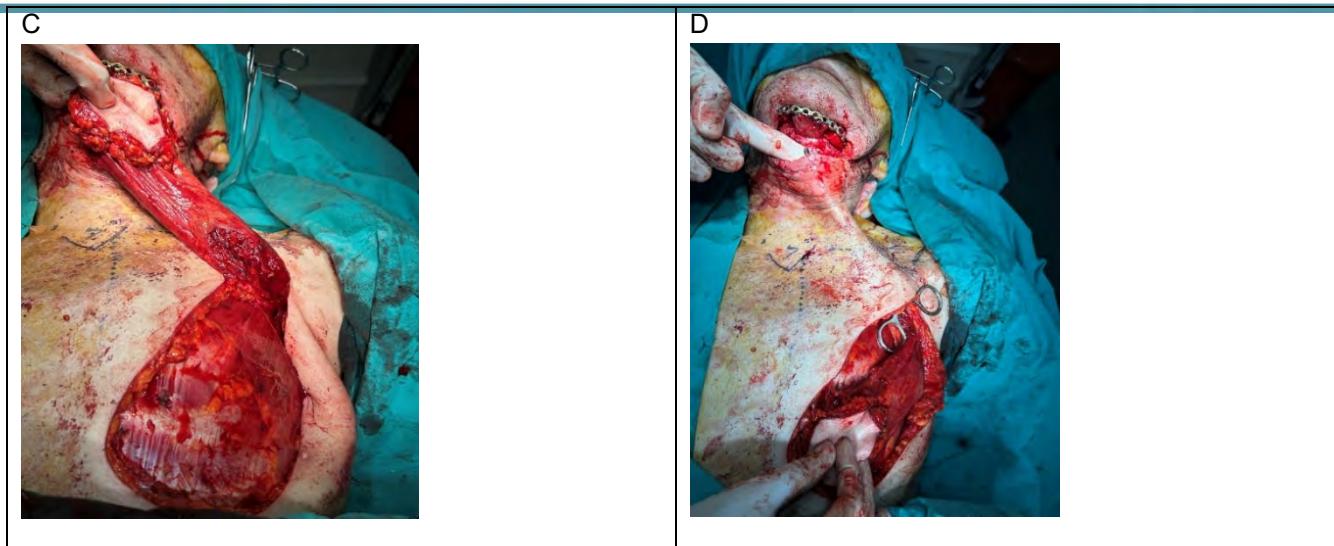


Figure 6: A: Lateral Torasic Artery pointed out with an instrument. B: Thoraco Acromial Pedicle C: Pectoralis Major Muscle Flap. D: Subcuticular-supraclavicular tunnel creation.

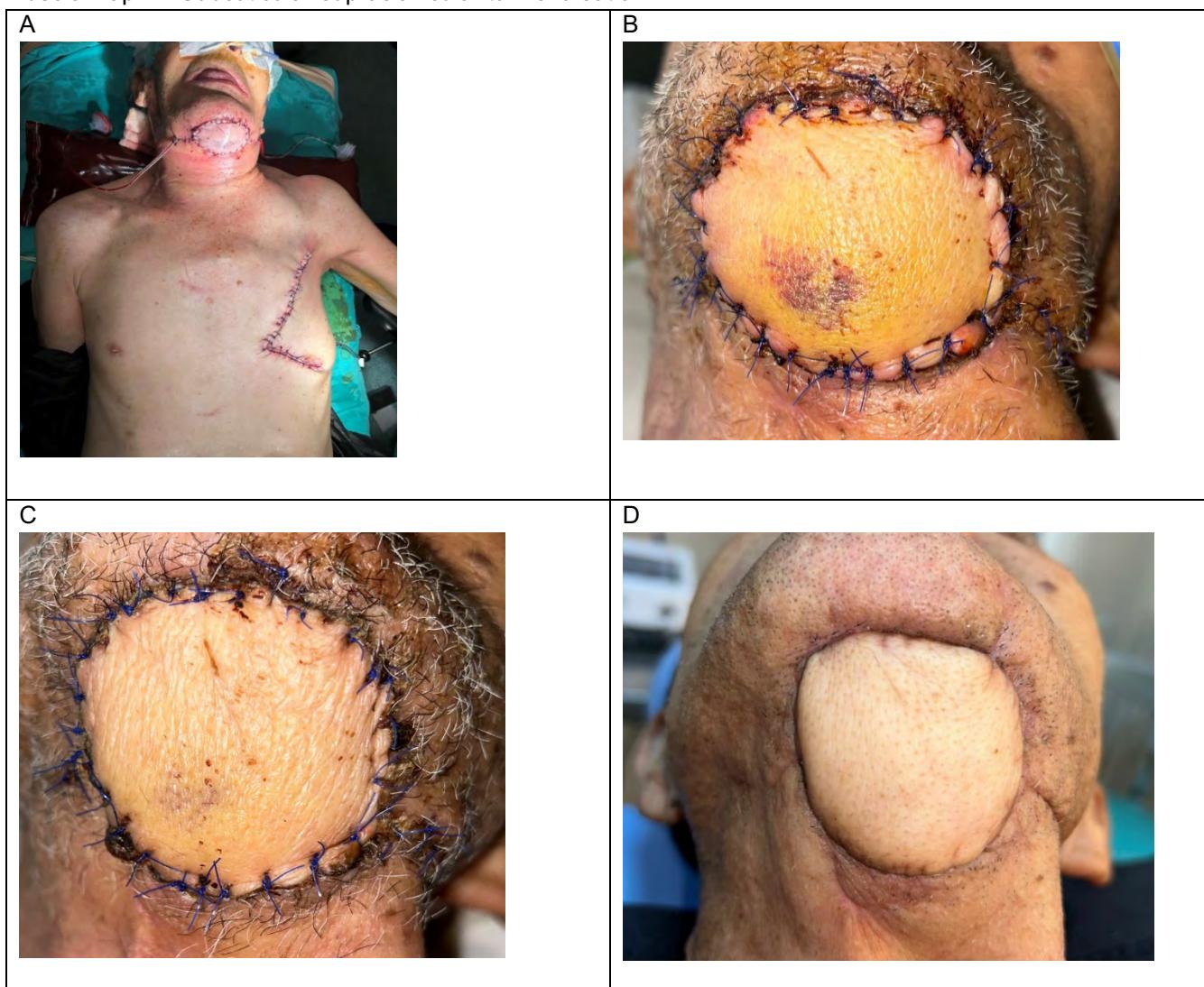


Figure 7: A: Suturation of the submental and thoracic regions. B: Clinical view of the PMMC flap on the postoperative seventh day C: Clinical view of the PMMC flap on the postoperative 14th day. D: Clinical view of the PMMC flap on the postoperative 2nd month.

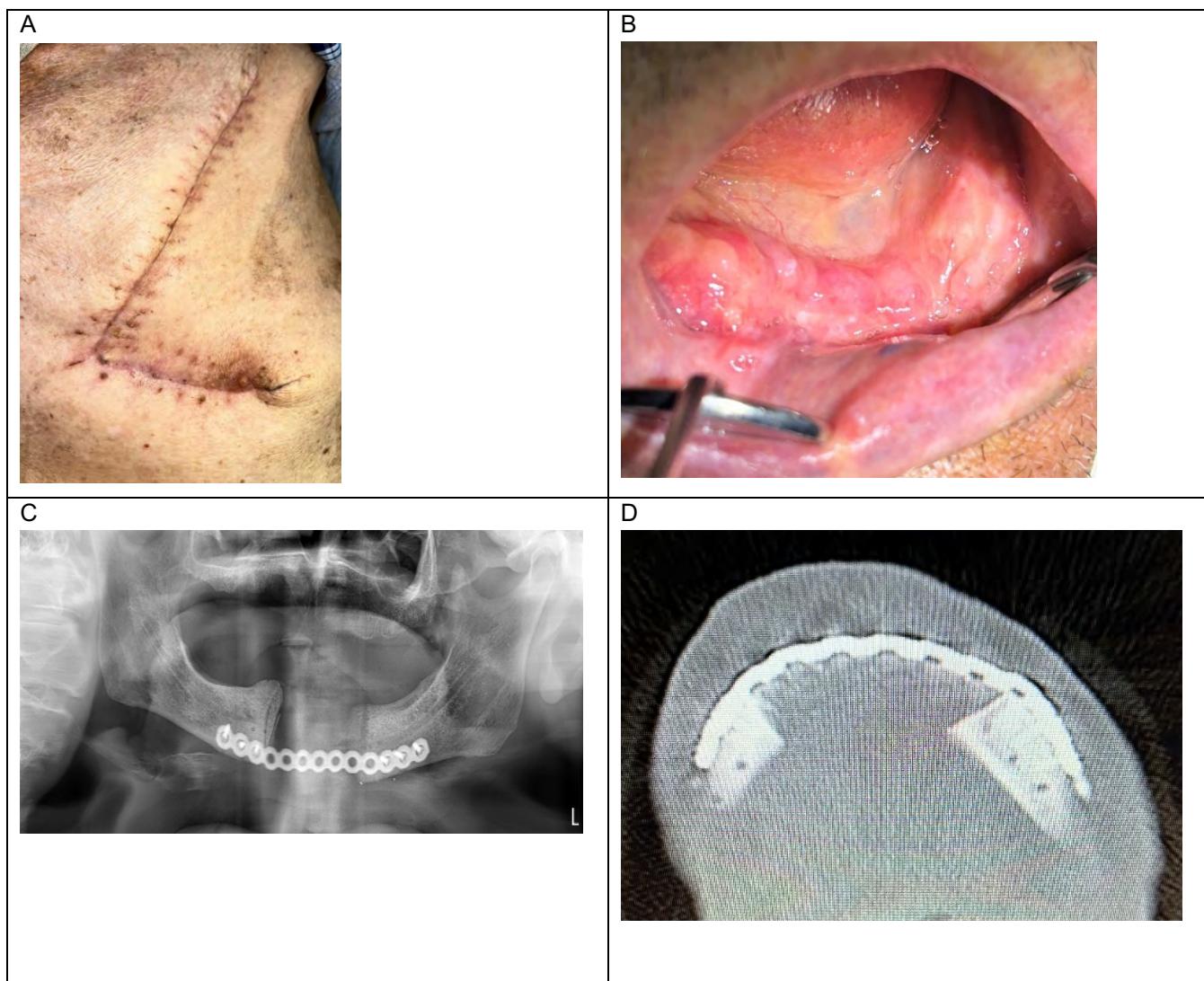


Figure 8: A: Clinical view of the donor site in the postoperative 2nd month. B: Intraoperative view in the postoperative 2nd month. C: The image of postoperative OPG in the 2nd month. D: The image of postoperative CT in the 2nd month.

SS-098

DECOMPRESSION TREATMENT APPLIED IN HUGE ODONTOGENIC CYSTS AND EVALUATION OF THE RESULTS

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ABSTRACT:

OBJECTIVE: This study discusses the decompression treatment and follow-up procedures applied in cases of odontogenic cysts observed in the jawbones.

CASE REPORT: The study includes 4 cases admitted to the Department of Oral and Maxillofacial Surgery at Uşak University Faculty of Dentistry. All cases involved healthy individuals. In all patients, asymptomatic, radiolucent, and well-defined lesions were identified through radiographic examination and clinical evaluation. In the first two cases, non-expansive multilocular lesions were detected. Both were diagnosed as odontogenic keratocysts via biopsy and managed with tube decompression followed by clinical monitoring.

In Case 3, a 48-year-old female presented with minimally expansive unilocular lesions in the right mandible and anterior maxilla. Biopsy revealed radicular and residual cysts. Decompression was performed using wire ligatures. The patient was followed up accordingly.

In Case 4, a 49-year-old male had a unilocular lesion in the left mandibular body associated with adjacent teeth. Biopsy confirmed a radicular cyst. Decompression treatment was administered using wire ligatures, and follow-up was conducted.

RESULT:

Lesion size reduction at 1, 3, 6, and 12-month follow-ups was comparable between tube and wire decompression methods. However, clinical differences were observed, with wire ligatures offering greater patient comfort. Further research is required to evaluate the long-term clinical success of this technique.

Keywords: decompression, odontogenic cyst, keratocyst, radicular cyst.

1. INTRODUCTION

Odontogenic cysts are pathological formations originating from odontogenic epithelium and are commonly seen in the jawbones. They are generally asymptomatic and are often detected incidentally during routine radiographic examinations. As the size of the cyst increases, the lesion may become associated with surrounding anatomical structures. For this reason, enucleation and curettage may be replaced by marsupialization or decompression as treatment options [1].

Decompression and marsupialization of jaw cysts were first introduced into the literature by Partsch. At that time, this treatment method was considered the gold standard for cysts. It involves the removal of the overlying epithelium and bone and the creation of a window into the cyst cavity [1].

Decompression, by definition, includes any technique that reduces the intracystic pressure responsible for cyst enlargement [2]. It is believed that the growth of cysts occurs due to increased osmotic pressure within the cyst, the resulting bone resorption, and the release of prostaglandins and growth factors [3][4]. Through decompression, the change in the intracystic environment leads to a decrease in the amount of interleukin-alpha released [5].

The procedure is performed by creating a small opening in the cyst and maintaining this opening with the help of one or more drains. In this way, cyst growth is controlled, and the lesion is expected to move away from critical anatomical structures. Various drain materials can be used during decompression treatment [6].

2. MATERIALS AND METHODS:

Case 1: A 26-year-old systemically healthy female patient presented with a panoramic radiograph showing an asymptomatic, radiolucent, non-expansile, multilocular, well-defined lesion in the right mandibular ramus and angle region, associated with tooth #48. Incisional biopsy revealed that the cyst was an odontogenic keratocyst. Decompression treatment with a tube drain was performed under local anesthesia. After 6 months of follow-up, the drain was removed, and cyst enucleation and curettage were carried out. After 2 years, tooth #48 was extracted.

Case 2: A 53-year-old systemically healthy patient presented with an asymptomatic, radiolucent, multilocular, well-defined, non-expansile lesion in the mandibular corpus region, associated with the roots of teeth #44–47.

Incisional biopsy confirmed the diagnosis of an odontogenic keratocyst. Decompression treatment with a tube drain was planned under local anesthesia. After 2 years of follow-up, a significant reduction in the size of the cyst cavity was observed.

Case 3: A 48-year-old systemically healthy female patient presented to our clinic with complaints of numbness in the right half of her lower lip. Radiographic examination revealed radiolucent, unilocular lesions causing minimal expansion in the edentulous area of the right mandibular corpus and in the anterior maxilla associated with tooth roots. Incisional biopsies of the lesions resulted in diagnoses of residual and radicular cysts. Decompression treatment with a wire drain was performed. During the patient's 1-year follow-up, a significant reduction in the cystic lesions was observed.

Case 4: A 49-year-old systemically healthy male patient presented with an asymptomatic, radiolucent, unilocular lesion associated with teeth in the left mandibular corpus. Incisional biopsy confirmed the diagnosis of a radicular cyst. Following the extraction of teeth #32 and #33 associated with the lesion, decompression treatment was performed using wire ligatures. During the 1-year follow-up, a marked reduction in the lesion was observed.

At the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Uşak University, decompression treatment was applied to the odontogenic cysts diagnosed in these four cases, and follow-up examinations were conducted. All patients were scheduled for routine check-ups twice a week, and the area was irrigated with saline solution.

3. DISCUSSION:

Decompression therapy is a method that has been used for many years and whose treatment effectiveness has been well established. By reducing the pressure within the cavity, this method aims to induce epithelial atrophy, increase osteoblastic activity, and promote bone regeneration [7].

In a study by Pogrel et al., it was emphasized that the type of drain used in decompression therapy may affect patient compliance, comfort, and complication rates [2].

In the study conducted by Marin et al., 55 cysts in 53 patients were treated using a custom-made obturator. Iodoform gauze was applied to the opening created during treatment, resulting in a reduction in cyst size [8]. Rungsaeng et al. compared marsupialization, decompression using a tube drain, and decompression using a stent. They reported that the treatment methods and materials used did not create a significant difference in outcomes [9].

In another study by Liu et al., a different type of drain was used in decompression therapy and followed over time.

At the end of the study, similar healing rates were observed in both the experimental and control groups [10].

Today, many different materials are used in decompression therapy, and new materials continue to be developed. Tube drains have been used in decompression treatment for many years and are considered the gold standard. However, this method also has disadvantages. Difficulties in long-term stabilization, blockage of the tube due to food retention, and challenges in maintaining oral hygiene are among these issues.

As an alternative, wire drains offer several advantages compared to tube drains: they occupy less space, are easier to clean, provide greater patient comfort, and offer better stabilization. These characteristics make wire drains a favorable option over traditional tube drains.

4. CONCLUSION:

In the four odontogenic cyst cases treated with decompression, both tube and wire drain applications demonstrated similar effectiveness in reducing cyst volume based on radiographic follow-up. However, wire drains were found to be more advantageous in terms of ease of application during surgery, patient comfort, and stability.

Decompression therapy is a safe and well-established method for large cysts or those located near or in contact with important anatomical structures. Based on clinical follow-up, wire drains appear to offer a more comfortable and safer option for patients. Nevertheless, larger-scale studies are needed to further support these findings.

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SS-099

Adjunctive Concentrated Growth Factor Application in the Enucleation of Odontogenic Cysts: Case Series

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1. Introduction

Cysts are pathological cavities lined by epithelium and filled with fluid, semifluid, or gelatinous content, and they are commonly encountered in the oral and maxillofacial region. Although generally benign, their growth potential may cause resorption of surrounding bone tissue, tooth migration, devitalization, functional impairment, and esthetic deformities. Jaw cysts are classified into two main groups: odontogenic and non-odontogenic. Among odontogenic cysts, radicular cysts are the most frequent. Studies conducted in Turkey have reported the prevalence of radicular cysts as 54.7% and residual cysts as 13.7%, while other series reported the prevalence of radicular cysts as 58.96% and residual cysts ranging between 2.2% and 18% (1-3).

The standard approach in surgical treatment is enucleation. However, spontaneous healing of large cystic cavities may take a long time, increasing the risk of infection, recurrence, or pathological fracture. Therefore, autogenous grafts, synthetic materials, and biological agents have been used to support healing. Concentrated Growth Factor (CGF) is an autologous matrix rich in fibrin, platelets, leukocytes, and growth factors, prepared by a special centrifugation protocol of venous blood without anticoagulants. Previous studies have indicated that CGF accelerates bone regeneration, promotes soft tissue healing, and improves postoperative comfort (4).

In this case series, the clinical effects of CGF applied during enucleation of radicular and residual cysts are presented in terms of surgical, histopathological, and postoperative healing parameters.

2. Case Reports**Case-1**

A 27-year-old systemically healthy male patient presented with complaints of fullness in the anterior maxilla, nasal obstruction, and intermittent discharge. Intraoral examination revealed a fluctuating swelling in the vestibular region. Cone-Beam Computed Tomography (CBCT) showed a unilocular radiolucent lesion measuring $30 \times 19 \times 20$ mm, extending from the right canine to the left molar region, associated with the nasal antrum. Aspiration confirmed the preliminary diagnosis of a radicular cyst. Teeth with negative vitality tests underwent root canal treatment.

Under general anesthesia with oral intubation and after local infiltration anesthesia, a crestal incision was made. A mucoperiosteal flap was elevated, and bony fenestrations were enlarged with a bur. The cyst capsule was carefully enucleated intact from the surrounding bone. Following hemostasis, apical resection of 3 mm was performed on the involved teeth, retrograde cavities were prepared, and filled with bioceramic material. Four tubes of venous blood collected preoperatively were centrifuged, and the obtained CGF was placed into the cavity (Fig. 1). The wound was primarily sutured.

The patient received postoperative antibiotics and analgesics. At the first-month follow-up, soft tissues were completely healed, and at the third month, radiographs showed new bone formation.

Case-2

A 64-year-old male patient with a history of ischemic stroke and under antithrombotic therapy presented with swelling in the left posterior maxilla. Clinical examination revealed a fluctuating swelling in the vestibular region. CBCT demonstrated a unilocular radiolucent lesion measuring $40 \times 35 \times 25$ mm, with well-defined radiopaque margins, in the premolar-molar area. The patient reported a previous cyst operation in the same region. Aspiration confirmed the preliminary diagnosis of a residual cyst.

Under general anesthesia, a crestal incision was made, and a mucoperiosteal flap was elevated. The cyst capsule was dissected from the surrounding bone and enucleated in one piece. During the operation, perforation of the sinus floor occurred (Fig. 2), which was repaired primarily with resorbable sutures and covered with a resorbable biomembrane. The excised tissue was sent for histopathological analysis.

Six tubes of venous blood were collected and centrifuged to prepare CGF, which was placed into the cavity. The wound was primarily closed. Considering the patient's systemic condition, close follow-up was maintained.

Healing was uneventful in the first week, and at the third month, radiographs revealed significant bone formation.

Case-3

A 44-year-old systemically healthy male presented with swelling in the right posterior maxilla. Clinical examination revealed a fluctuating swelling in the vestibular region. CBCT showed a unilocular radiolucent lesion measuring $40 \times 34 \times 21$ mm in the premolar-molar region with thickening of the sinus membrane. Aspiration confirmed the preliminary diagnosis of a radicular cyst.

Under general anesthesia with nasotracheal intubation and after local infiltration anesthesia, a crestal incision was made, and a mucoperiosteal flap was elevated. The cyst capsule was dissected from the surrounding bone through widened fenestrations and enucleated intact. The specimen was sent for histopathology. After hemostasis, the cavity was irrigated thoroughly with antibiotic solution and saline.

Four tubes of venous blood were centrifuged to obtain CGF, which was placed into the cavity. The flap was closed primarily. The postoperative course was uneventful, with reduced edema observed in the early period and bone trabeculation evident radiographically at the second month.

3. Discussion

Enucleation has long been the standard treatment for cystic lesions. However, spontaneous bone regeneration in large cavities may take a prolonged period and carries the risk of complications (5). For this reason, biomaterials and biological agents that accelerate bone regeneration have been investigated.

CGF is a more advanced preparation method developed by Sacco after Choukroun's Platelet-Rich Fibrin (PRF) technique (6). Venous blood collected without anticoagulants is centrifuged under variable speed and time to produce a dense fibrin matrix. This structure contains platelets, leukocytes, and growth factors such as PDGF, TGF- β , and VEGF. The slow release of these factors ensures prolonged biological activity (7). The fibrin network provides stability within the bony cavity, facilitates osteoblast migration, and supports angiogenesis via VEGF (8-10).

Several studies have demonstrated the positive effects of CGF on healing in odontogenic cyst surgery. Shyu et al. (11) reported an increase in bone density, while Chen et al. (12) observed accelerated soft tissue healing and improved patient comfort. Sacher et al. (13) emphasized the supportive role of CGF in wound healing. However, You et al. (14), in a study evaluating bone defect reduction at six months, found no significant difference between the CGF group and the control group (conventional blood clot).

In our case series, CGF application was associated with rapid soft tissue closure, reduced swelling and pain, and early radiographic evidence of bone formation. These findings are consistent with previous literature.

Nevertheless, the small number of patients and absence of a control group represent limitations of this study. Further large-scale, prospective, randomized studies are required to clarify the clinical efficacy of CGF.

4. Conclusion

CGF, with its autologous and biocompatible structure, ease of preparation, and applicability alongside surgical treatment, is a valuable biological adjunct in the management of odontogenic cysts. In cases with large bony cavities, it may accelerate bone regeneration and contribute to the healing process. However, its efficacy needs to be confirmed through larger, controlled clinical trials.

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SS-100

Odontojenik Enfeksiyonu Taklit Eden İzole Oral Myeloid Sarkom: Bir Literatür Derlemesi ve Olgu SunumuMurat Urgun, F. Bahar Sezer

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Özet (Abstract) Myeloid sarkom (MS), miyeloid öncül hücrelerin kemik iliği dışında oluşturduğu nadir bir malign tümördür. Oral kavitede görülmesi ise oldukça nadirdir ve sıklıkla yaygın dental patolojileri taklit ederek tanısal güçlükler yol açar. Bu olgu sunumunda, başlangıçta odontojenik enfeksiyon şüphesiyle değerlendirilen ancak ileri tetkikler sonucu 'myeloid sarkom' tanısı alan 35 yaşındaki sistemik olarak sağlıklı bir erkek hasta sunulmaktadır. Hastanın sol mandibular bölgesindeki şişlik ve ağrı şikayetiyle başvurduğu, alınan biyopsinin histopatolojik ve immünohistokimyasal (MPO+, CD45+, CD33+) incelemesiyle MS tanısı konulmuştur. Yapılan moleküler analizlerde, прогнозu olumsuz etkileyebilen FLT3-TKD ve ASXL1 gen mutasyonları saptanırken, MS ile sıkça ilişkilendirilen t(8;21) ve inv(16) gibi translokasyonlar saptanmamıştır. Hasta, Akut Myeloid Lösemi (AML) protokollerine uygun sistemik kemoterapiye yönlendirilmiş ve oral lezyonlarında tam bir iyileşme gözlenmiştir. Kemik iliği nakli hazırlık sürecinde, onkoloji bölümünün isteği üzerine potansiyel enfeksiyon odağı olarak görülen, lezyon bölgeye komşu bir dişin çekimi de gerçekleştirılmıştır. Bu vaka, atipik ağız içi lezyonlarda MS'in ayırcı tanıda düşünülmesinin ve multidisipliner vaka yönetiminin önemini vurgulamaktadır.

1. Giriş (Introduction) Dünya Sağlık Örgütü'nün güncel sınıflandırmasına göre myeloid sarkom (MS), kemik iliği haricindeki dokularda, maturasyon potansiyeli taşıyan ya da taşımayan miyeloid veya monositik blastların anormal birikimiyle karakterize neoplastik bir oluşumdur(Loghavi et al., 2024). Genellikle Akut Myeloid Lösemi (AML) ile birlikte, öncesinde veya sonrasında ortaya çıkabildiği gibi, miyeloproliferatif neoplazmaların bir bulgusu olarak da görülebilir.(Almond et al., 2017; Loghavi et al., 2024) MS herhangi bir anatomiik bölgede görülebilmekle birlikte, oral kavitede ortaya çıkması oldukça nadirdir. (de Andrade et al., 2017) Oral bölgedeki myeloid sarkomlar, sık karşılaşılan periodontal apse, odontojenik kist, piyojenik granülom veya epulis gibi benign lezyonları klinik olarak taklit edebilirler.(Kurdoglu et al., 2013; Yap et al., 2014) Bu durum, tanıda gecikmelere ve yanlış tedavi yaklaşımlarına neden olma potansiyeli taşımaktadır. Bu olgu sunumunda, başlangıçta yaygın bir diş hekimliği problemi şüphesiyle değerlendirilen ancak ileri tetkikler sonucu 'myeloid sarkom' tanısı alan 35 yaşındaki erkek hastanın vaka yönetimi, moleküler profili ve literatür eşliğinde tartışılmıştır.

Literatür Derlemesi (Review of the Literature)

- Epidemiyoloji ve Nadirlik Myeloid sarkomun, AML hastalarının %3 ila %8'inde görüldüğü bildirilmektedir. Eş zamanlı kemik iliği tutulumu olmaksızın MS'in de novo prezantasyonu olan izole MS, yetişkinlerde tahmini 2/1.000.000 insidansı ile daha da nadirdir. Oral kavite tutulumu istisnaidir. En sık etkilenen intraoral bölgeler diş eti, damak ve dildir, ancak lezyonlar ağızın herhangi bir yerinde ortaya çıkabilir.
- Patogenez ve Moleküler Profil MS'in patogenezi, genetik değişiklikler ve hücre adezyonundaki değişiklikler tarafından yönlendirilen, miyeloid blastların ekstramedüller yayılmasını içerir. *NPM1* ve *FLT3* gibi genlerdeki mutasyonların, lösemik hücrelerin adezyon ve migrasyon özelliklerini değiştirerek kemik iliği dışına yayılmalarına katkıda bulunduğu düşünülmektedir. *CD56* gibi anahtar adezyon moleküller ve *CXCR4* gibi kemokin reseptörlerinin de bu hücrelerin ekstramedüller dokulara yerleşmesini kolaylaştırdığı belirtilmiştir. Genetik olarak MS, sıklıkla AML'nin sitogenetik ve moleküler manzarasını yansıtır. Tekrarlayan anomalilikler arasında, bazı bağamlarda paradoksal olarak daha olumlu bir прогнозa ilişkili olan t(8;21) ve inv(16) gibi çekirdek bağlayıcı faktör (CBF) translokasyonları bulunur. Bununla birlikte, vakaların önemli bir kısmı, özellikle monositik özelliklere sahip olanlar, *FLT3* (hem ITD hem de TKD varyantları) ve *ASXL1* gibi genlerde yüksek riskli mutasyonlar barındırır. Bu nedenle, genetik imza прогнозun güçlü bir belirleyicisi olduğundan ve tedaviyi yönlendirebildiğinden, kapsamlı bir moleküler inceleme esastır.
- Klinik Sunum ve Tanısal Zorluklar Oral MS tanısındaki temel zorluk, spesifik olmayan klinik görünümüdür. Ağrılı veya ağırsız lokalize bir şişlik, diffüz bir diş eti büyümesi, bir ülser veya polipoid bir kitle olarak ortaya çıkabilir. Rengi normal mukoza pembesinden eritematöz, mavimsi veya griye kadar değişebilir. Bu değişkenlik, oral MS'in sıklıkla periodontal veya periapikal apseler, piyojenik granülomlar, fibröz hiperplazi veya odontojenik kistler gibi yaygın dental durumları taklit etmesi anlamına gelir. Bu taklit, ilk yanlış

tanının ve uygun sistemik tedavideki gecikmelerin onde gelen nedenidir. Radyografik bulgular genellikle minimal veya spesifik değildir ve bazı vakalarda önemli bir kemik yıkımı görülmemesi tanıyı daha da karmaşıklaştırır.

- Tanısal İnceleme MS'in kesin tanısı ancak doku biyopsisi ve ardından yapılan histopatolojik ve immünohistokimyasal (İHK) analizlerle konulabilir. Histolojik olarak lezyon, olgunlaşmamış,blastik hücrelerin diffüz bir infiltrasyonunu gösterir. İHK paneli, onayı için çok önemlidir. Miyeloid soy, tipik olarak Myeloperoksidaz (MPO), CD45, CD68, CD33 ve CD117 gibi belirteçler için pozitiflikle doğrulanır. Eş zamanlı olarak, lenfoma ve karsinomu dışlamak için lenfoid (örneğin, CD20, CD3) ve epitelyal (örneğin, Sitokeratin) belirteçler için negatiflik gereklidir.
- Tedavi ve Prognoz Literatürde, izole bir lezyon olarak ortaya çıksa bile MS'in sistemik bir hastalık olarak tedavi edilmesi gerektiği konusunda geniş bir fikir birliği vardır. Tek başına lokal tedaviler (cerrahi veya radyoterapi) yetersizdir ve sistemik AML'ye yüksek oranda ilerleme ile ilişkilidir. Tedavinin temel taşı, AML odaklı sistemik kemoterapidir. Oral lezyonlar tipik olarak bu yaklaşıma mükemmel bir yanıt gösterir. *FLT3* geni gibi hedeflenebilir mutasyonların tanımlanması, kemoterapi ile birlikte tirozin kinaz inhibitörleri (örneğin, midostaurin) gibi hedefe yönelik tedavilerin kullanılmasının önünü açmıştır ve bu da sonuçları iyileştirebilir. Uygun hastalar için, hematopoietik kök hücre nakli (HKHN), nüks riskini azaltmak için bir konsolidasyon tedavisi olarak kabul edilir. MS için genel prognoz hala ihtiyatlıdır ve büyük ölçüde hastalığın altında yatan moleküller ve sitogenetik risk profiline bağlıdır.

2. Olgı Sunumu (Case Presentation) 35 yaşında, sistemik olarak sağlıklı erkek hasta, sol çenede ağız dışında fark edilen şişlik, hafif ağrı ve sabah yorgunluğu şikayetleriyle bir diş hekimine başvurmuştur. Anamnezinde günde bir paket sigara kullanımı mevcuttur. Şikayetlerin odontojenik bir enfeksiyondan kaynaklandığı düşünülerek hastaya kök kanal tedavisi ve detarraj önerilmiş, ancak semptomların gerilememesi üzerine hasta Ege Üniversitesi Diş Hekimliği Fakültesi'ne yönlendirilmiştir.

- Klinik ve Radyografik Bulgular: Hastanın ekstraoral muayenesinde, sol mandibular bölgede yüz asimetrisine neden olan diffüz bir şişlik izlenmekteydi (Figür 1). Ağız içi muayenede, sol mandibular posterior bölgedeki diş etinde eritematöz, ödemli ve belirgin hiperplazik bir görünüm saptanmıştır. Lezyonun yüzeyinde ülserasyon ve nekrotik alanlar dikkat çekmekteydi (Figür 2). Panoramik radyografide, yaygın horizontal kemik kaybı dışında belirgin bir kemik yıkımı saptanmamıştır (Figür 3).
- Patolojik ve Moleküler Analiz: Lezyondan alınan biyopsinin histopatolojik incelemesinde, kas ve bağ dokularına sızan, blastik görünümlü neoplastik hücrelerden oluşan diffüz bir infiltrasyon gözlandı. İmmünohistokimyasal (İHK) incelemelerde, neoplastik hücrelerin Bcl-2, c-myc, CD45 ve CD33 ile yaygın pozitif olduğu, Ki-67 proliferasyon indeksinin yüksek olduğu saptandı. Bu bulgularla hastaya 'Myeloid Sarkom' tanısı konuldu. Hastanın kemik iliği ve periferik kanından yapılan ileri moleküler analizlerde; MS ile sıkça ilişkilendirilen t(8;21), inv(16), t(15;17) gibi kromozomal yeniden düzenlenmeler saptanmadı. Ancak, yeni nesil dizième (NGS) ile prognоз olumsuz etkileyebilen *FLT3* geninde D855 mutasyonu ve *ASXL1* geninde patojenik (Tier 1) bir mutasyon tespit edildi.
- Tedavi ve Takip: Tanı sonrası hasta hematoloji-onkoloji kliniklerine yönlendirildi ve AML protokollerine uygun sistemik kemoterapi başlandı. Tedavinin tamamlanmasının ardından hastanın ekstraoral şişliğinin tamamen gerilediği ve simetrinin sağlandığı görüldü (Figür 4). Ağız içi lezyonun ise tamamen iyileştiği, yerinde normal görünümlü ve sağlıklı bir mukoza dokusunun oluştuğu gözlandı (Figür 5). Hastanın planlanan kemik iliği nakli öncesinde, hematoloji ve onkoloji doktorlarının konsültasyonuyla, orijinal lezyon bölgesine komşu olan ve potansiyel bir enfeksiyon odağı olarak değerlendirilen dişin çekimi yapıldı. Çekim sonrası bölgeye primer sütürasyon uygulandı (Figür 6).

3. Tartışma (Discussion) Myeloid sarkomun oral kavitede izole bir bulgu olarak ortaya çıkması, bu vakanın da gösterdiği gibi, hem nadirliği hem de tanısal zorlukları nedeniyle dikkat çekicidir (Martínez Nieto et al., 2024; Wang et al., 2014). Vakamız, lezyonun başlangıçta yaygın bir odontojenik enfeksiyon veya periodontal apseyi taklit etmesiyle literatürdeki benzer olgularla örtüşmektedir. (Ishikawa et al., 2020) Radyografide belirgin kemik yıkımının olmaması, tanının başlangıçta neden dental patolojilere yönlediğini açıklamaktadır. Bu durum, literatürde sıkılıkla vurgulanan bir noktadır: Standart tedavilere yanıt vermeyen, atipik ve inatçı oral lezyonlar karşısında klinisyenlerin, özellikle diş hekimlerinin, malignite şüphesini daima göz önünde bulundurması ve erken biyopsiye yönelmesi hayatı önem taşır.. (Martínez Nieto et al., 2024; Wang et al., 2014)



Lezyonun kimliği, histopatolojik ve immünonhistokimyasal analizlerle netleştirilmiştir. Dokuda CD45, CD33 ve MPO gibi miyeloid kökenli hücre belirteçlerinin saptanması, aynı anda lenfoid (CD20) ve epitelyal (Sitokeratin) belirteçlerin negatif bulunması, ayırcı tanıyı daraltarak MS'i kesinleştirmiştir. (Wilson & Medeiros, 2015)

MS'in ekstramedüller bölgelere yerleşme mekanizması tam olarak aydınlatılamamış olsa da, genetik mutasyonların ve adezyon moleküllerinin rol oynadığı düşünülmektedir. Özellikle

NPM1 ve FLT3 gibi mutasyonların, anormal miyeloid hücrelerin adezyon ve migrasyon özelliklerini değiştirerek ekstramedüller yayılıma katkıda bulunduğu öne sürülmektedir (Martínez Nieto et al., 2024)

Bu vakanın literatüre en önemli katkılarından biri, detaylı moleküler profilinin ortaya konulmasıdır. MS olgularında zaman zaman görülen ve daha olumlu bir прогнозla ilişkilendirilen t(8;21) ve inv(16) gibi CBF translokasyonları hastamızda saptanmamıştır. (Martínez Nieto et al., 2024; Wilson & Medeiros, 2015) Buna karşılık, AML'de genellikle daha agresif bir hastalık seyrine işaret eden FLT3-TKD ve ASXL1 gen mutasyonlarının varlığı, hastamızın başlangıçtaki agresif klinik tablosuna moleküler düzeyde bir açıklama getirmektedir. (Loghavi et al., 2024; Martínez Nieto et al., 2024) Bu genetik imza, vakamızı sık görülen CBF-pozitif MS olgularından ayırmakta ve kapsamlı bir genetik work-up'ın prognostik değerini vurgulamaktadır.

Tedavi stratejisi olarak, güncel kılavuzlarla uyumlu şekilde, lezyonun izole olmasına rağmen sistemik bir hastalığın habercisi olduğu kabul edilmiş ve hastaya AML tipi kemoterapi uygulanmıştır. (Ishikawa et al., 2020) Oral lezyonun bu tedaviye tam yanıt vererek tamamen kaybolması (Figür 5), bu yaklaşımın ne kadar doğru olduğunu ve MS tedavisinin lokal değil, sistemik olması gerektiğini bir kez daha teyit etmiştir. Bu yaklaşımın doğruluğunu ve MS'in sistemik tedavilere duyarlığını kanıtlamaktadır. Ayrıca, hastamızın vaka yönetiminde, kemik iliği nakli gibi yoğun tedavi süreçleri öncesinde diş hekiminin de dahil olduğu multidisipliner bir yaklaşımla ağız içindeki potansiyel enfeksiyon odaklarının ortadan kaldırılması adımı da atılmıştır.

Sonuç (Conclusion) Oral miyeloid sarkom, nadir görülmeyeceğine rağmen, iyileşmeyen veya atipik ağız içi lezyonların ayırcı tanısında akılda tutulmalıdır. Kesin tanı için biyopsi ve İHK analizi zorunludur. Sunduğumuz bu vaka, moleküler analizin, hastalığın прогнозunu belirlemekte önemli olduğunu ve onkolojik hastaların yönetiminde multidisipliner iş birliğinin kritik rol oynadığını göstermektedir. (Loghavi et al., 2024; Martínez Nieto et al., 2024; Wilson & Medeiros, 2015)

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MANAGEMENT OF ADVANCED-STAGE MRONJ: CASE SERIES

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ABSTRACT

Objective: Medication-related osteonecrosis of the jaw (MRONJ) is a significant clinical condition that develops as a consequence of antiresorptive, antiangiogenic and other antineoplastic drugs prescribed for the treatment of osteoporosis and oncologic diseases, severely compromising quality of life. The aim of this study is to evaluate current therapeutic strategies for advanced MRONJ (stages II–III) and to present the treatment protocol implemented in our clinic.

Materials and Methods: A narrative review of recent literature was conducted with a focus on stage-specific management protocols. In addition, patients diagnosed with stage II and III MRONJ at our faculty were treated according to our clinical protocol, which consisted of conservative and minimally invasive approaches including sequestrectomy with removal of necrotic bone, debridement, irrigation, laser therapy, plasma irrigation of the surgical site, application of platelet-rich fibrin (PRF), and other supportive measures without major resections.



Result: MRONJ is most frequently triggered by tooth extraction, while poor oral hygiene and systemic comorbidities accelerate its progression. Conservative measures such as antibiotic therapy, oral hygiene optimization, and chlorhexidine rinses are effective in early stages and may occasionally result in spontaneous sequestrum elimination. In advanced stages, surgical debridement is often required, and adjunctive modalities including teriparatide, pentoxifylline–tocopherol, photodynamic therapy, and platelet-rich fibrin (PRF) have demonstrated additional benefits. In our case series, debridement combined with irrigation and laser therapy achieved mucosal healing and symptom relief, consistent with findings reported in the literature. Our own treatment protocol has also been described.

Conclusion: MRONJ remains a preventable but challenging condition with substantial morbidity. Current evidence and our clinical observations highlight that conservative protocols may suffice in early stages, while advanced disease frequently requires surgical debridement. Debridement-based, laser-assisted, and irrigation-supported protocols, complemented by adjuvant therapies, offer a promising alternative to radical resections, emphasizing the importance of individualized, multidisciplinary management.

Key Words: Jaw osteonecrosis, Advanced MRONJ, Surgical debridement

1. Introduction

Medication-related osteonecrosis of the jaw (MRONJ) is a serious adverse condition primarily associated with antiresorptive and antiangiogenic therapies used for osteoporosis and bone-involved malignancies. First described by Marx in 2003 as bisphosphonate-related osteonecrosis of the jaw (BRONJ), the terminology evolved in 2014 when the American Association of Oral and Maxillofacial Surgeons (AAOMS) expanded it to include agents such as denosumab and anti-VEGF drugs (1).

Clinically, MRONJ presents as exposed necrotic bone in the maxillofacial region lasting more than eight weeks in patients with no prior jaw radiation but with a history of relevant drug exposure. Symptoms include pain, swelling, infection, impaired chewing and in advanced cases, pathological fractures (2).

Despite ongoing research, optimal management of Stage II and III MRONJ remains debated. Various conservative and surgical approaches have been proposed, often combined with biological or pharmacological adjuncts. Recent studies have emphasized the potential benefits of platelet-rich fibrin (PRF), diode laser therapy, and teriparatide in enhancing tissue repair and reducing morbidity (3).

This case series presents four patients with advanced-stage MRONJ treated using a minimally invasive, function-preserving clinical protocol. Our aim is to evaluate the clinical outcomes and align our findings with current evidence-based recommendations.

2. Case

- Protocol:

As part of our standardized protocol for the management of Stage II and III MRONJ, all patients underwent conservative surgical treatment in combination with biological and adjunctive therapies.

A tiered antibiotic regimen was implemented as follows:

-First-line therapy: Amoxicillin–Clavulanate, administered for 14 to 21 days.

- Second-line therapy: Clindamycin, prescribed for the same duration.

-Third-line therapy: If additional antimicrobial coverage was required, Metronidazole was added for one week, administered twice daily.

- Fourth-line therapy: In cases of inadequate response, Doxycycline was considered as an alternative option.

In addition, Platelet-Rich Fibrin (PRF) was applied to all surgical sites to enhance both soft tissue and bone healing. Postoperatively, diode laser therapy was administered twice weekly to reduce inflammation, promote angiogenesis, and accelerate mucosal recovery.

- Case-1:

A 74-year-old male with metastatic prostate cancer had been receiving monthly subcutaneous Denosumab (Xgeva) for four years and was also on targeted therapy (enzalutamide). He presented with exposed necrotic bone and an extraoral fistula in the mandibular region, accompanied by pain and purulent discharge. Stage III MRONJ was diagnosed following a molar extraction. Surgical debridement and sequestrectomy were performed. PRF was applied to the site and diode laser therapy was initiated postoperatively. Complete mucosal closure was achieved by week six, with full symptom resolution. (Figure 1)

- Case-2:

A 71-year-old female patient had been on weekly oral alendronate (Fosavance) therapy for osteoporosis for one year. She presented with mandibular bone exposure and mild discomfort. Stage II MRONJ was diagnosed. Conservative debridement and PRF membrane placement were performed and diode laser therapy was applied twice weekly. By the fourth postoperative week, partial mucosal healing was observed. (Figure 2)

- Case-3:

A 54-year-old female patient with a history of breast carcinoma, initially diagnosed in 2011, developed brain and spinal metastases in 2019. She had been on monthly Denosumab (Xgeva) therapy for approximately five years. Clinically, there was extensive exposed necrotic bone involving the entire maxilla and the right posterior mandible, consistent with Stage III MRONJ. Under general anesthesia, the affected teeth were extracted, and the surgical sites were covered using PRF membranes. Diode laser therapy was applied regularly as an adjunct to enhance mucosal healing and reduce inflammation. The patient was followed for two years. Despite comprehensive local management, she unfortunately passed away due to progression of systemic disease. (Figure 3)

- Case-4:

A 61-year-old female who had been receiving annual intravenous bisphosphonate therapy for osteoporosis over a three-year period presented with spontaneous bone exposure in the posterior mandible. She was diagnosed with Stage II MRONJ. Conservative debridement, PRF membrane placement and twice-weekly diode laser therapy were performed. Full mucosal healing was achieved by the sixth week. (Figure 4)

The management of Stage II and III medication-related osteonecrosis of the jaw (MRONJ) has increasingly shifted toward conservative, biologically guided treatment strategies. In this study, we adopted a multimodal protocol involving limited surgical debridement, systemic antibiotic therapy, platelet-rich fibrin (PRF) application, and diode laser therapy, resulting in favorable clinical outcomes.

PRF has emerged as a regenerative adjunct that supports both angiogenesis and soft tissue healing. Troeltzsch et al. demonstrated that PRF promotes healing through the sustained release of growth factors and immune-modulating cytokines, showing promising results in advanced MRONJ cases (4). Similarly, Kim et al. reported improved mucosal closure rates and reduced postoperative discomfort when PRF was used alongside surgical debridement (5). Our findings align with these results, with patients exhibiting accelerated epithelialization and decreased postoperative infection.

Low-level laser therapy (LLLT), particularly with diode lasers, has also shown beneficial effects on fibroblast activity and inflammation control. Romeo et al. observed enhanced healing and pain reduction in MRONJ lesions treated adjunctively with diode laser therapy (6). These outcomes were mirrored in our patients, all of whom underwent biweekly laser treatment postoperatively.

Although teriparatide was not part of our clinical protocol, recent studies highlight its ability to stimulate osteoblastic activity and support bone regeneration. Sim et al. reported successful MRONJ resolution in osteoporotic patients treated with teriparatide, suggesting its potential as an adjunct in refractory cases (7).

Overall, our findings support the growing body of literature favoring biologically enhanced, minimally invasive protocols for the management of Stage II and III MRONJ. Nevertheless, further randomized controlled trials are needed to establish standardized treatment pathways and assess long-term outcomes.

4. Conclusion

This case series demonstrates that conservative surgical debridement, combined with PRF and diode laser therapy, provides favorable healing outcomes in advanced-stage MRONJ. Our clinical results are consistent with recent literature, supporting the effectiveness of minimally invasive, biologically enhanced protocols as a reliable alternative to aggressive surgical resection.

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6. Figures

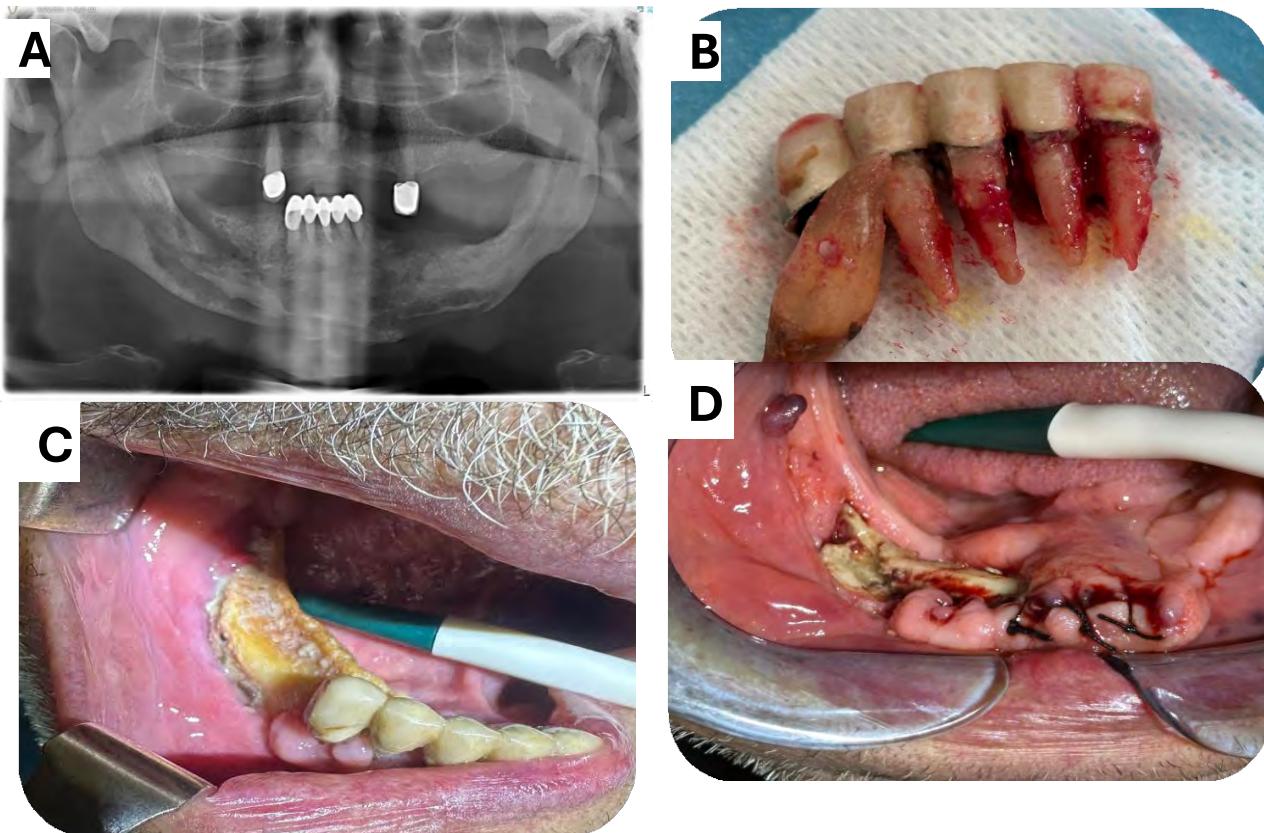


FIGURE 1: A:Radiological appearance of the lesion , B:Clinical images of the extracted teeth, C:Intraoperative view of necrotic bone, D: Postoperative appearance of the surgical site



FIGURE 2: A: Preoperative intraoral view , B: Preoperative radiographic view , C: Exposed necrotic bone view , D: Intraoperative debridement of necrotic bone, E: Postoperative view



FIGURE 3: A: Preoperative radiographic view , B: Postoperative radiographic view , C: Intraoperative view of necrotic bone exposure

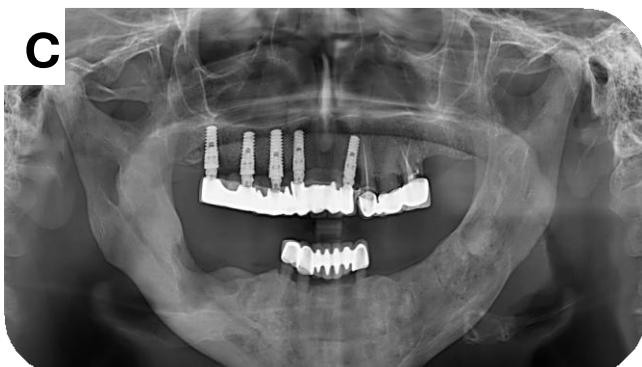


FIGURE 4: A: Postoperative radiographic view , B: Radiographic view after implant removal, C: 3 months post-surgical radiograph , D: Postoperative 9 months

SS-109**EVALUATION OF LABORATORY FINDINGS IN MAXILLOFACIAL INFECTIONS AND REVIEW OF RECENT LITERATURE**Ahmet Türker^a, Gülcen Ecem Doğancı^b, Metin Berk Kasapoğlu^c

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Abstract

Objectives: Maxillofacial infections are clinically significant due to their rapid progression and potential to cause life-threatening complications, particularly in cases of odontogenic origin. The aim of this study is to evaluate the diagnostic value of laboratory parameters used in the diagnosis and prognosis of maxillofacial infections, including C-Reactive Protein (CRP), Erythrocyte Sedimentation Rate (ESR), White Blood Cell Count (WBC), fibrinogen, and related biomarkers, in the light of current literature.

Materials and Methods: Relevant studies published between 2000 and 2025 were reviewed using the PubMed, Scopus, and Web of Science databases. The relationships between laboratory biomarkers such as CRP, ESR, WBC, fibrinogen, and neutrophil-to-lymphocyte ratio (NLR), and clinical parameters and treatment outcomes were analyzed.

Results: CRP was identified as the most sensitive parameter for evaluating the severity of infection due to its rapid response and short half-life. ESR was found to be useful in chronic and prolonged cases, whereas the specificity of WBC elevation was limited. Fibrinogen levels showed correlation with clinical findings such as pain and trismus.

Conclusion: Laboratory parameters, particularly CRP, are important complementary tools in the evaluation of maxillofacial infections. When used in conjunction with clinical examination, they contribute to early diagnosis, risk stratification, and treatment planning. Further prospective studies are required for routine clinical implementation.

Key Words: Maxillofacial infections, Laboratory findings, Biomarkers

1. Introduction

Maxillofacial infections constitute a significant portion of head and neck infections and most commonly originate from odontogenic sources. These infections may spread rapidly through deep facial and cervical fascial spaces, leading to serious complications such as airway obstruction, mediastinitis, sepsis, and even death (1). Despite advances in antibiotic therapy and surgical techniques, morbidity remains considerable in severe cases.

Inflammation is a physiological defense mechanism of the body against irritants such as thermal, mechanical, and chemical stimuli. Infection, however, refers to tissue invasion by microorganisms and their toxins, triggering a more complex inflammatory response. Accurate evaluation of disease severity is essential for timely surgical intervention and antibiotic management.

Laboratory biomarkers such as CRP, ESR, WBC, fibrinogen, and inflammatory ratios including NLR have gained increasing importance in both diagnosis and follow-up of maxillofacial infections (2,3,7). These parameters serve as valuable complementary tools alongside clinical examination and radiological imaging.

2. Materials And Methods

A comprehensive literature search was performed using PubMed, Scopus, and Web of Science databases for studies published between 2000 and 2025. The keywords used included "maxillofacial infections," "odontogenic infection," "CRP," "ESR," "WBC," "fibrinogen," "NLR," and "PLR." Clinical studies, reviews, and meta-analyses evaluating laboratory biomarkers in maxillofacial infections were included.

3. Results

3.1 C-Reactive Protein (CRP)

CRP was first described in 1930 by William Tillet and Thomas Francis and is synthesized by hepatocytes in response to inflammatory cytokines. In healthy individuals, CRP levels are below 5 mg/dL (7). It has a short half-life of approximately 5–7 hours and rises rapidly following the onset of infection.

Several clinical studies have demonstrated that CRP is more sensitive and reliable than WBC in monitoring odontogenic fascial space infections (2,5,6). Elevated CRP levels correlate strongly with clinical severity, postoperative recovery, and length of hospital stay (2,6). Because of its rapid decline after effective treatment, CRP is considered the most reliable marker in follow-up.

3.2 White Blood Cell Count (WBC) and Total Leukocyte Count (TLC)

WBC, also referred to as TLC, is a traditional indicator of infection. Leukocytosis is commonly observed in acute bacterial maxillofacial infections (5,6). However, WBC levels may also rise due to stress, trauma, corticosteroid use, or systemic diseases, which limits its diagnostic specificity when compared with CRP (5).

3.3 Erythrocyte Sedimentation Rate (ESR)

ESR measures the rate at which erythrocytes settle in a vertical tube and serves as a nonspecific marker of inflammation. It is particularly useful in chronic and prolonged infections (3). Normal reference values are ≤ 10 mm/h in children aged 1–12 years, ≤ 15 mm/h in adult males, and ≤ 20 mm/h in adult females. Unlike CRP, ESR declines slowly and is influenced by age, anemia, pregnancy, and plasma protein composition, reducing its specificity.

3.4 Fibrinogen

Fibrinogen is an acute-phase protein involved in both coagulation and inflammation. Elevated fibrinogen levels have been shown to correlate with pain severity, trismus, and the extent of tissue involvement in maxillofacial infections (3). It may provide additional prognostic information when evaluated together with CRP and ESR.

3.5 Neutrophil-to-Lymphocyte Ratio (NLR) and Platelet-to-Lymphocyte Ratio (PLR)

NLR and PLR reflect systemic inflammatory status. Recent studies have demonstrated that NLR values above 5.19 are associated with severe odontogenic infections, prolonged hospitalization, and increased antibiotic requirements (4,8). In contrast, changes in PLR have not consistently shown statistically significant correlations with clinical severity (4).

4. Discussion

Recent studies emphasize that no single laboratory parameter is sufficient for the comprehensive evaluation of maxillofacial infections. CRP stands out as the most sensitive and dynamic biomarker for acute infections due to its rapid kinetics and strong correlation with clinical severity and hospital stay (2,5,6,7). ESR plays a complementary role in monitoring chronic inflammatory activity but lacks specificity (3).

WBC remains useful as a routine screening test; however, its prognostic reliability is inferior to CRP (5,6). In bacterial infections, neutrophil predominance is typically observed, whereas lymphocytosis is more common in viral infections. Although microbiological culture remains the gold standard for pathogen identification, it is time-consuming and may delay treatment initiation. Moreover, antibiotic therapy may mask both clinical and laboratory findings.

NLR appears to be a promising inflammatory biomarker associated with disease severity and recovery status (4,8). Nevertheless, further prospective studies are required to establish standardized cut-off values for routine clinical use.

5. Conclusion

Laboratory biomarkers play a pivotal role in the diagnosis, prognosis, and follow-up of maxillofacial infections. Among these, CRP stands out as the most reliable acute-phase marker due to its short half-life and strong correlation with clinical severity and length of hospital stay (7,2,5,6). ESR, WBC, fibrinogen, and NLR provide complementary prognostic information. When integrated with clinical and radiological findings, these parameters significantly enhance early

diagnosis, risk stratification, and treatment planning. Further large-scale prospective clinical studies are required to establish standardized use in daily practice.

6. References

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SS-110

MEDICATION-RELATED OSTEONECROSIS OF THE JAW (MRONJ): A CASE SERIES AND LITERATURE-BASED CLINICAL EVALUATION

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Abstract Objective:

Medication-related osteonecrosis of the jaw (MRONJ) is a severe complication associated with antiresorptive and antiangiogenic therapies. This study presents three MRONJ cases managed in our clinic and evaluates clinical findings within the context of contemporary guidelines.

Case:

Three patients under long-term antiresorptive therapy were examined. Case 1 involved a 70-year-old male with metastatic prostate carcinoma receiving intravenous bisphosphonate therapy. Case 2 was a 83-year-old female with metastatic breast cancer treated with zoledronic acid for three years, who underwent a 4-month preoperative and 6-month postoperative drug holiday. Case 3 included a 92-year-old female with long-term (9 years) intravenous zoledronic acid use. All patients were evaluated clinically and radiologically, diagnosed according to AAOMS 2022 criteria, and managed with conservative or surgical approaches. Adjunctive methods such as low-level laser therapy, PRF-assisted surgery, and antimicrobial protocols were applied in selected cases.

Conclusion:

MRONJ risk is influenced by medication type, cumulative dose, treatment duration, systemic comorbidities, and local trauma. High-dose intravenous bisphosphonates and concurrent corticosteroid therapy markedly increase susceptibility. Surgical management combined with adjunctive techniques can improve outcomes in advanced cases. Individualized treatment planning remains essential for optimal prognosis.

Key Words: Antiangiogenic drugs, antiresorptive drugs, bisphosphonate, debridement, MRONJ.

1. Introduction

Medication-related osteonecrosis of the jaw (MRONJ) is defined as exposed bone or bone detectable through an intraoral or extraoral fistula persisting for at least eight weeks in patients with a history of antiresorptive or antiangiogenic medication use, without prior radiation therapy to the jaws (1). First described by Marx in cancer patients receiving intravenous bisphosphonates, the terminology later expanded to include non-bisphosphonate agents.

The pathophysiology is multifactorial: suppressed bone remodeling, inhibition of angiogenesis, altered immune response, oral microbial invasion, and local trauma contribute to lesion development (2). AAOMS 2022 staging categorizes MRONJ severity from Stage 0 (non-specific clinical/radiographic findings) to Stage 3 (severe osteonecrosis with complications such as pathological fracture or sinus involvement) (1). Identifying risk profiles is critical, as high-dose IV therapy, treatment duration exceeding four years, corticosteroid use, diabetes, smoking, and dentoalveolar surgery increase susceptibility (5).

This report presents three MRONJ cases and discusses diagnostic and therapeutic considerations within the scope of current literature.

2. Case Reports**2.1 Case 1**

A 70-year-old male with Stage IV prostate carcinoma receiving long-term intravenous bisphosphonate therapy presented with exposed necrotic bone and pain consistent with AAOMS Stage 2 MRONJ (1). Clinical examination revealed inflamed mucosa, erythema, and purulence. Conservative management including antimicrobial rinses, systemic antibiotics, and limited debridement was performed. Symptom reduction was achieved, and follow-up demonstrated partial mucosal healing.

2.2 Case 2

A 65-year-old female with a history of metastatic breast carcinoma had received intravenous zoledronic acid (4 mg) for three years. She underwent a 4-month drug holiday prior to surgery and a 6-month postoperative holiday. Clinical and radiographic evaluation revealed Stage 3 MRONJ with sinus involvement (1). Surgical debridement with sequestrectomy was performed, supported by PRF application and low-level laser therapy to enhance healing (9,10). Postoperative follow-up showed improved mucosal closure and symptomatic improvement.

2.3 Case 3

A 58-year-old female with nine years of intravenous zoledronic acid therapy presented with chronic non-healing exposed bone. According to AAOMS 2022 criteria, the lesion was classified as Stage 2 MRONJ (1). Conservative treatment and targeted surgical resection were applied. Due to advanced age and comorbidities, therapy was individualized. Gradual improvement was observed during follow-up.

3. Discussion

Risk assessment remains a crucial component of MRONJ management. Medication type and potency significantly influence risk: intravenous zoledronic acid carries the highest risk, followed by denosumab, whereas romosozumab demonstrates a comparatively lower but not negligible incidence due to limited exposure in current literature (5). Corticosteroids further elevate MRONJ risk by impairing angiogenesis and cellular bone turnover (3,4).

Drug holidays remain controversial. AAOMS 2022 does not universally recommend cessation of bisphosphonates due to insufficient evidence but acknowledges that individualized decisions may be considered in high-risk cases (1,4). For denosumab, interruption poses a known rebound bone turnover risk; surgery is optimally timed at the end of the dosing interval (around the 5th month) (5,11). Bone turnover markers such as CTX lack predictive accuracy and are not recommended for clinical decision-making (1,5).

Treatment strategies include conservative protocols (antimicrobials, pain management, oral hygiene optimization) and surgical approaches such as sequestrectomy and resection (1–4).

Adjunctive modalities including photobiomodulation (LLLT), PRF, ozone, hyperbaric oxygen, and pentoxifylline–tocopherol therapy have shown beneficial effects in tissue healing and inflammation control (6–10).

4. Conclusion

MRONJ management requires patient-specific assessment considering systemic status, drug regimen, and lesion stage. Cancer patients receiving high-dose IV bisphosphonates remain at greatest risk (1,3,4). Denosumab-associated MRONJ demands careful surgical timing, while corticosteroid therapy contributes to delayed healing (3–5). Combining surgical intervention with adjunctive regenerative or photobiomodulative techniques may enhance clinical outcomes (6–10). Early diagnosis and individualized care remain essential.

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6. Figures

Figure 1. Case 1 – Intraoral view showing exposed necrotic bone and mucosal breakdown.



Figure 2. Case 1 – Panoramic radiograph demonstrating osteolytic changes around mandibular implants.

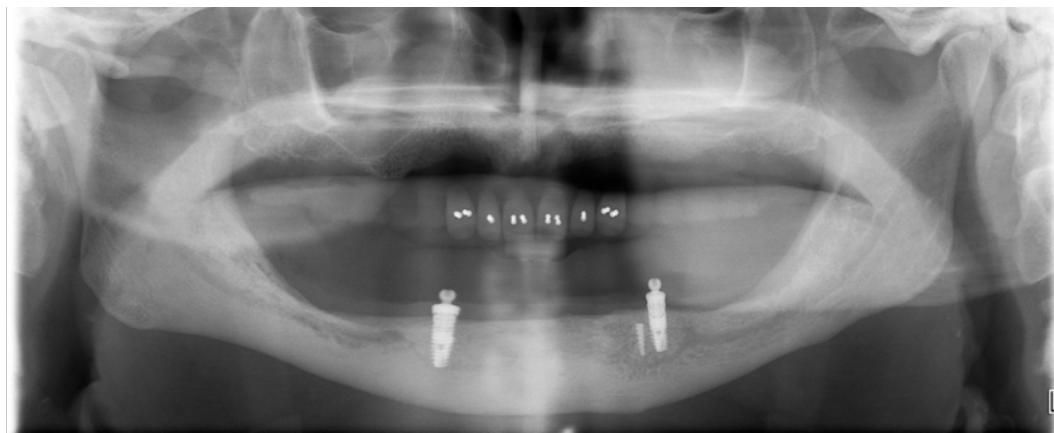


Figure 3. Case 2 – Intraoral view showing necrotic bone exposure and surrounding inflammation.



Figure 4. Case 2 – Intraoperative photograph illustrating sequestrectomy and removal of necrotic bone.

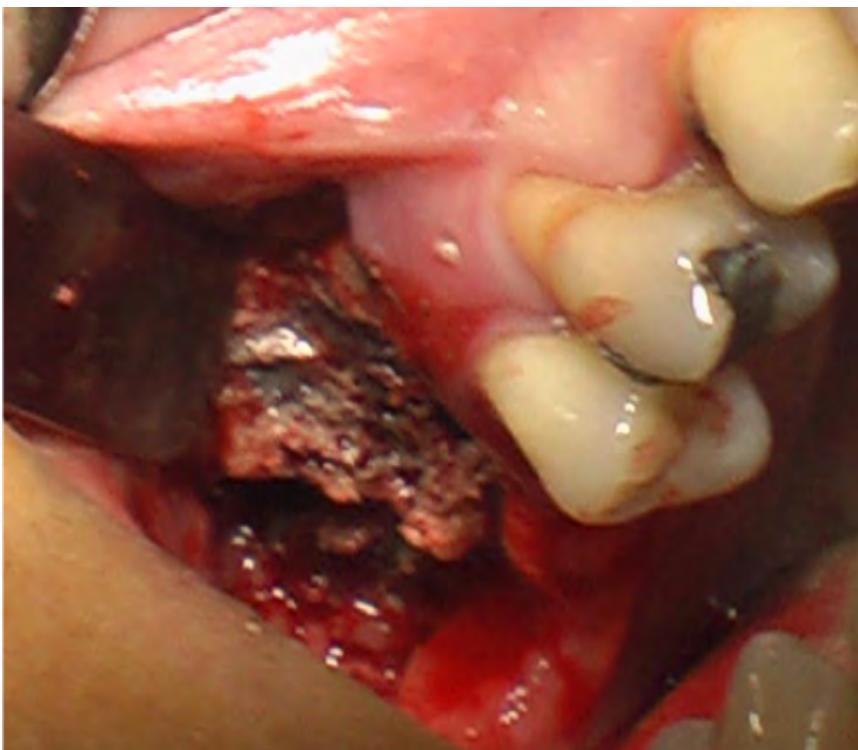


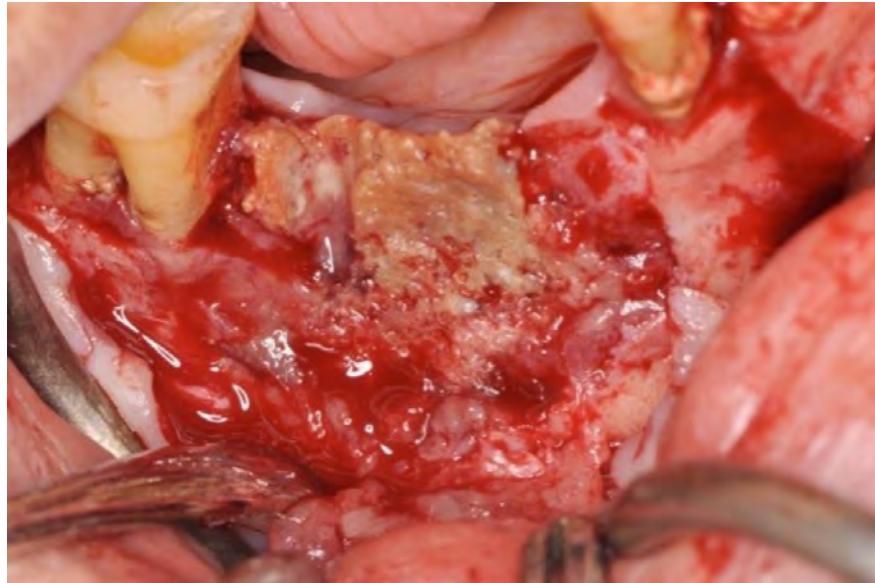
Figure 5. Case 2 – Panoramic radiograph demonstrating maxillary involvement and osteolytic changes.



Figure 6. Case 3 – Intraoral view showing extensive exposed necrotic bone along the mandibular ridge.



Figure 7. Case 3 – Intraoperative view demonstrating surgical debridement of necrotic bone.



SS-113

Nörofibromatozis Tip 1 Tanılı Çocuk Hastada İntraosseöz Nörofibroma: Nadir Bir Olgu Sunumu ve Literatür Derlemesi

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Giriş

Nörofibromatozis tip 1 (NF1), NF1 genindeki patojenik varyantlara bağlı, otozomal dominant ve multisistemik bir hastalıktır; tanı NIH (1988) kriterlerine dayanır. Oral bulgular nadir rapor edilse de dikkatli inceleme ile sıklıkabilir; intraosseöz mandibular nörofibroma ise oldukça seyrektrir.

Bazı olgularda nüks ve nadiren malign periferal sinir kılıfı tümörüne (MPNST) dönüşüm riski bildirilmiştir.

Erken tanı ve multidisipliner izlem klinik açıdan önemlidir.

Olgu

On yaşında, aile öyküsü pozitif (anne ve abi) NF1'li kız çocukta café-au-lait lekeleri, aksiller çillenme, hafif skolyoz ve sağ mandibulada hafif şişlik izlendi. İntraoral olarak sağ premolar- retromolar bölgede diffüz submukozal büyümeye mevcuttu; hasta asemptomatikti. Panoramik görüntülemede mandibula posteriorunda sınırları belirsiz, buzlu cam benzeri radyolusensi ve ikinci moların sürme gecikmesi; CBCT'de bukkal-lingual ekspansiyon, mandibular kanal

genişlemesi ve kemik destrüksiyonu saptandı. Aspirasyon biyopsisi nondiagnostikti; insizyonel biyopside kollajenöz/miksoid stromada dalgalı iğsi hücrelerden oluşan tümör görüldü. S-100 kuvvetle pozitif, SMA negatif; atipi/mitoz/nekroz yoktu. Bulgularla intraosseöz nörofibroma tanısı kondu. Hasta pedodonti ve Ağız-Diş-Çene Cerrahisi tarafından düzenli izlenmeye, büyümeye

hızına/komplikasyonlara göre cerrahi eksizyon planlanmaktadır.

Tartışma

NF1'de nörofibromalar tipik olarak kutanöz olsa da intraoral/intraosseöz yerleşim nadirdir ve erüpsiyon anomalilerine yol açabilir. Kesin tanı histopatoloji ve immünonhistokimya (S-100 pozitifliği) ile desteklenir.

Tedavi, lezyonun boyutu ve progresyonuna göre bireyselleştirilir;

adolesanda hızlanma görülebilir. İntraosseöz lezyonlarda cerrahi rezeksiyon temel seçeneklerdir; diffüz yapıda tam eksizyon güçleşebilir. Pleksiform tiplerde nüks ve MPNST riski daha yüksektir. NF1'in multisistemik doğası nedeniyle pediatri, genetik, ortopedi, oftalmoloji, dermatoloji ve çene cerrahisinin eşgündümü gereklidir.

Sonuç

NF1'li çocukta intraosseöz mandibular nörofibroma, diş sürme anomalileri, alveoler kret genişlemesi ve kanal değişiklikleriyle seyretti. Erken tanı ve düzenli klinik-radyolojik takip prognoz ve komplikasyonların önlenmesi için kritiktir; hızlı büyüyen/semptomatik lezyonlarda

biyopsi geciktirilmemelidir. Pedodontistler erken fark etmede, çene cerrahları tanısal doğrulama ve tedavi planlamasında kilittir; multidisipliner yaklaşım optimal yönetimi sağlar.

SS-114

ODONTOGENIC KERATOCYST: A CASE REPORT AND REVIEW OF THE LITERATURE

Abstract

Objectives: Odontogenic keratocyst (OKC) is an odontogenic cystic lesion characterized by aggressive behavior and a high recurrence rate. It is most commonly observed in the mandible and typically presents radiographically as a unilocular or multilocular radiolucent lesion. The primary objective of treatment is complete removal of the lesion and reduction of the risk of recurrence.

Case report: 45-year-old male patient presented to our clinic with a radiolucent lesion detected in the right mandibular region. Incisional biopsy confirmed the diagnosis of odontogenic keratocyst. As an initial treatment approach, marsupialization was performed for 6 months to reduce the size of the lesion and decrease intra-cystic pressure. Following this period under general anesthesia, enucleation of the lesion was performed. After enucleation the surgical field was treated with Carnoy's solution without chloroform. During the 2-year follow-up period, no sensory disturbances or recurrence were observed in the affected area.

Conclusion: Odontogenic keratocysts differ from other odontogenic cysts due to their aggressive behavior and high recurrence risk. Simple enucleation alone is frequently inadequate. Marsupialization, particularly in large lesions, facilitates subsequent surgery by reducing cystic volume and preserving cortical bone. Use of Carnoy's solution after enucleation helps eliminate epithelial remnants and satellite cysts, thereby lowering recurrence. However, the classic formulation contains chloroform, which, despite its effectiveness, is associated with cytotoxicity, tissue necrosis and potential carcinogenicity. For this reason, modified Carnoy's solution was chosen in the present case to minimize recurrence risk while maintaining patient safety.

Key words: Modified Carnoy's Solution, Odontogenic keratocyst, Recurrence.

1. Introduction

Odontogenic keratocysts (OKC) are epithelial developmental cysts first described by Philipsen in 1956 (1). They represent approximately 3–11% of odontogenic cysts and occur most often in the second and third decades of life, with a slight female predominance (2). Although they may arise in any jaw region, the mandible—particularly the posterior body and ascending ramus—is the most common site (3). Radiographically, OKCs usually appear as well-defined unilocular or multilocular radiolucent lesions with corticated margins, and 25–40% are associated with an unerupted tooth (4).

They are considered among the most aggressive odontogenic cysts due to their high recurrence rate and tendency to infiltrate adjacent structures (5). Reported recurrence rates range from 20% to 62% depending on treatment (6-7). Management options vary from conservative procedures such as marsupialization and enucleation, to adjunctive therapies like Carnoy's solution or cryotherapy and more aggressive approaches including marginal or radical resection (6). Modified Carnoy's solution is obtained by removing chloroform from the original formulation due to its toxic and potentially carcinogenic effects. It is widely used as an adjunct after enucleation of odontogenic keratocysts to reduce recurrence, with studies showing efficacy comparable to the classic formulation(8).

2. Case Report

A 42-year-old male patient presented to the Department of Oral and Maxillofacial Surgery with complaints of pain and mild swelling in the right mandibular region. Clinical examination revealed mild swelling and tenderness in the affected area. Radiographic evaluation using cone beam computed tomography (CBCT) demonstrated a well-defined multilocular radiolucent lesion extending from the right mandibular second molar region posteriorly to the ascending ramus of the mandible(Figure 1). The lesion was in intimate association with the inferior alveolar nerve, and mild buccolingual expansion was observed, accompanied by cortical perforation on the lingual aspect.

Review of previous radiographs demonstrated that, on a panoramic radiograph obtained seven years earlier, the lesion measured approximately 1 cm in diameter and was associated with the roots of the mandibular molars, suggesting a slow but progressive growth pattern (Figure 2).

Initial management involved marsupialization, which was maintained for six months. Subsequent cone beam computed tomography (CBCT) showed partial ossification along the cavity walls, bone formation in the region adjacent to the inferior alveolar canal, and closure of the lingual cortical perforation (Figure 3). Definitive surgery was performed under general anesthesia, during which the lesion was completely enucleated and curetted, and the bony cavity was subsequently treated with modified Carnoy's solution (chloroform-free) for three minutes (Figure 4). The postoperative course was uneventful, and no neurosensory deficits were observed. During a two-year follow-up period, clinical and radiographic evaluations revealed no evidence of recurrence.

3. Discussion

Most cases of OKCs occur between the second and fourth decades, with rare presentation after the age of 70 (9,10). Although a male predominance has been reported in many studies, this cohort showed a slightly higher frequency in females (10,11). The main presenting symptoms were swelling, pain, and infection, while 10% of lesions were incidentally detected on routine radiographs, indicating that OKCs can expand within cancellous bone before buccolingual enlargement becomes clinically evident (12,13). Mandibular involvement was more frequent (73%), consistent with previous reports of 65–83% (11,14). Radiographically, most lesions were unilocular (71.6%), about one-third were associated with unerupted teeth, and root resorption was uncommon (1.3%), lower than the 5–11% reported in earlier studies (15).

The management of OKCs remains controversial, with enucleation generally associated with higher recurrence rates compared to other modalities (15–16). However, some studies have reported no statistically significant difference in recurrence rates among the various surgical modalities. (17–18). In a clinical study, 2 of 30 cases treated with enucleation recurred within 12–56 months. Notably, most recurrences (6 of 7) occurred in the symphysis–body region, likely due to the more conservative surgical approach typically employed in this area (19).

Pogrel et al., in a series of 13 cases, reported complete clinical and radiographic resolution with marsupialization followed by enucleation, with no recurrence observed during a mean follow-up of 2.9 years. This approach was emphasized as particularly valuable in large lesions, where immediate enucleation may risk damage to adjacent structures (20).

In the systematic review conducted by Kaczmarzyk and colleagues, 108 patients were evaluated. The recurrence rate in cases treated with enucleation alone ranged from 20.69% to 54.55%. When enucleation was combined with peripheral ostectomy, the recurrence rate was reduced to 18.18%, whereas no recurrences were reported when peripheral ostectomy was combined with Carnoy's solution (0%). Although peripheral ostectomy appears effective in reducing recurrence, it has been emphasized that this technique may increase the risk of nerve injury and postoperative morbidity. The application of Carnoy's solution has also been highlighted for its recurrence-reducing potential (21).

Blanas et al. reviewed 578 OKCs and reported that only enucleation carried a high recurrence rate of 28.7%. In contrast, adjunctive application of Carnoy's solution after enucleation reduced recurrence to 1.6%, comparable to resection but with less morbidity. They further suggested decompression followed by enucleation as an effective option for large lesions, concluding that Carnoy's solution provides the most conservative treatment with the lowest recurrence when long-term follow-up is feasible (5).

Nonetheless, the chloroform component of the classic Carnoy's solution presents significant safety concerns. Chloroform is cytotoxic, hepatotoxic, and nephrotoxic, and the World Health Organization has classified it as a possible human carcinogen. For this reason, recent investigations have focused on evaluating the efficacy and safety of the chloroform-free modified Carnoy's solution (MCS) in the management of odontogenic keratocysts (OKCs).

Janas-Naze et al. analyzed 122 cases and found no significant difference in recurrence between classic Carnoy's solution (CS) and MCS (8.2% vs 10.2%), confirming that MCS is equally effective while avoiding chloroform-related risks(22). Similarly, Donnelly et al. reported in a multicenter retrospective comparison that recurrence rates and time to recurrence were comparable between CS and MCS, underscoring the adequacy of the modified formulation(23).

Alchalabi et al. conducted a clinical study on 29 patients. All cases were managed under general anesthesia by enucleation combined with peripheral ostectomy, followed by application of modified Carnoy's solution (chloroform-free) to the bony cavity for three minutes. No recurrences were reported during the follow-up period. At presentation, neurosensory disturbance was noted in 9 patients, and this number increased to 11 postoperatively with the addition of 2 new cases(24).

Experimental findings by Karthik et al. further demonstrated that MCS achieves tissue penetration and necrosis comparable to CS, indicating that the removal of chloroform does not compromise clinical efficacy(25). Consistent with these observations, Hellstein et al.^[5] concluded that chloroform provides no unique therapeutic benefit and Winters et al. emphasized in a contemporary review that MCS should be considered a preferred adjunct in modern protocols due to its favorable safety profile(26-27). Likewise, Gele^u et al. noted a widespread clinical shift toward MCS, driven by the recognition of chloroform's carcinogenic potential(28). Collectively, these data provide strong justification for adopting MCS as a safe and effective adjunct in the surgical management of OKCs.

4. Conclusion

This case underscores the value of a staged conservative protocol in the management of large odontogenic keratocysts. Marsupialization effectively reduced cyst volume, facilitating safer enucleation, while adjunctive application of chloroform-free Carnoy's solution minimized recurrence risk without exposing the patient to the adverse effects of chloroform. Although long-term follow-up remains essential, this approach represents a reliable and safe treatment strategy supported by contemporary evidence.

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6. Figures

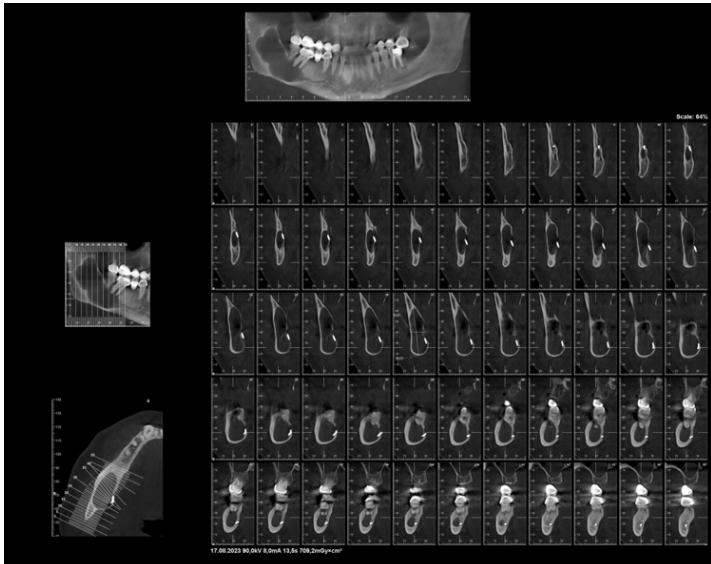


Figure 1: CBCT of the lesion



Figure 2: Panoramic view of the lesion seven years prior.

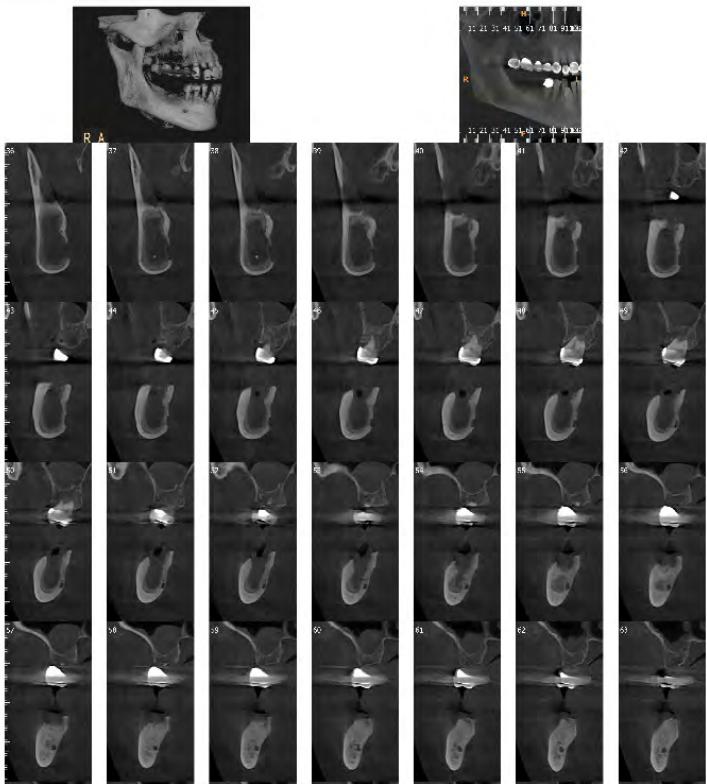


Figure 3 : CBCT evaluation following marsupialization.

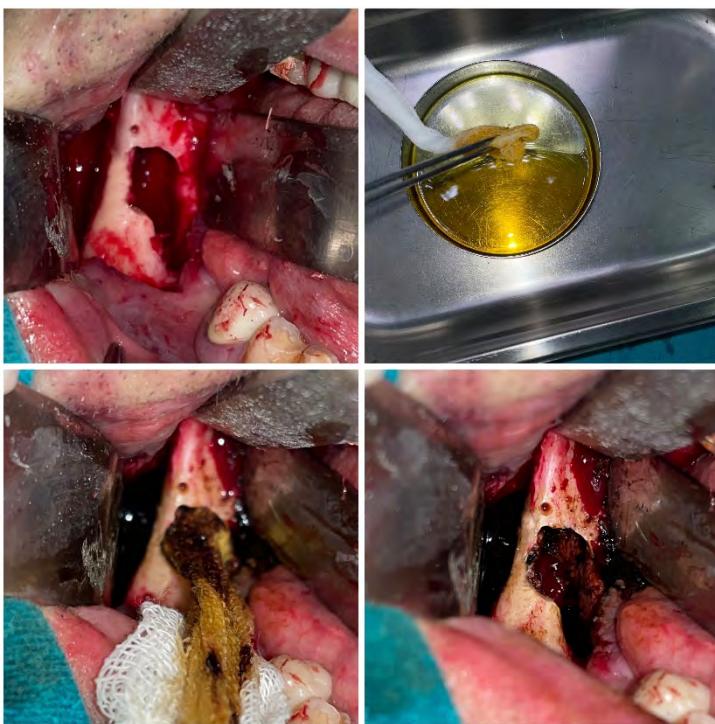


Figure 4: Application of modified Carnoy's solution following cyst enucleation.

SS-116

Management of Persistent Oroantral Communications with Buccal Myomucosal Flaps: Two Case Reports

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Abstract

Objective: The timely and appropriate closure of oroantral communications (OAC) is crucial to prevent infection and preserve function. When conventional flaps fail or are inadequate for large defects, buccal myomucosal flaps offer a reliable alternative. This report presents two cases successfully treated with this technique.

Case: Case A: A 52-year-old male patient with a persistent OAC following tooth extraction and a previous failed closure at another center presented with discharge. Clinical and radiological evaluation revealed a large defect. Under general anesthesia, the sinus cavity was curetted and cleaned, and a buccal myomucosal flap was rotated over the defect. After one month, the pedicled portion extending into the buccal mucosa was resected. The patient remained complication-free during two years of follow-up.

Case B: A 63-year-old male patient presented with a four-year history of halitosis and nasal fluid regurgitation. His medical history included two unsuccessful OAC closure attempts at other centers. Surgery was performed under general anesthesia, the sinus cavity was curetted and cleaned, and a buccal myomucosal flap was harvested and adapted over the defect. After one month, the pedicled portion was resected, and stable closure was achieved. No complications were observed during one year of follow-up.

Conclusion: In both cases, successful outcomes were achieved with buccal myomucosal flaps despite previous failed surgical interventions. Long-term follow-up revealed no complications. Buccal myomucosal flaps appear to be a reliable and effective treatment option, particularly in large and recurrent OACs.

Keywords: maxillary sinus, oral surgery, persistent oroantral communications

1. Introduction

Oroantral communications (OAC) are pathological connections between the oral cavity and the maxillary sinus that may occur following tooth extractions in the posterior maxilla, surgical removal of cystic or tumoral lesions, or trauma. If left untreated, they may lead to chronic oroantral fistula and maxillary sinusitis (1). Timely and appropriate closure of OAC is critical to prevent infections and preserve normal functions.

Several surgical techniques have been described for the closure of OAC. Buccal flaps, palatal rotation flaps, buccal fat pad flaps, and free grafts are the most commonly used methods. However, in cases where these techniques fail or are insufficient due to the size of the defect, buccal myomucosal flaps represent a reliable alternative (2). This report presents two cases of oroantral communications that developed after tooth extraction and were successfully treated with the buccal myomucosal flap technique.

2. Case Reports

2.1 Case A

A 52-year-old, systemically healthy male patient presented with persistent purulent discharge one year after extraction of tooth 26, which had previously been surgically closed at another center. Clinical and radiographic evaluation revealed a persistent OAC. Due to the size of the defect and history of prior surgery, closure with a buccal myomucosal flap was planned. Under general anesthesia, a full-thickness flap was raised from the left maxilla, and the sinus cavity was curetted and cleaned. The sinus opening was first closed with a buccal fat pad. Subsequently, a buccal myomucosal flap was harvested from the left cheek with preservation of the facial artery, rotated over the maxillary sinus, and adapted to the defect for primary closure. Flap perfusion was verified, and the cheek mucosa was advanced for tension-free closure. After one month, the pedicled portion of the flap extending intraorally was trimmed. During two years of follow-up, no complications were observed, and stable closure was achieved.

2.2 Case B

A 62-year-old, systemically healthy male patient presented with a four-year history of purulent discharge, pain, halitosis, and nasal fluid regurgitation in the posterior maxilla. His medical history revealed two failed surgical attempts for OAC closure at other centers. Clinical examination showed an oroantral fistula larger than 2 cm. Given the large defect and repeated failures, closure with a buccal myomucosal flap was planned. Under general anesthesia, a full-thickness flap was elevated in the left maxilla, and the sinus cavity was curetted and cleaned. A buccal myomucosal flap was harvested from the left cheek with preservation of the facial artery, rotated over the sinus, and secured to the defect. The buccal mucosa was advanced for primary closure, while areas under tension were left to heal secondarily. Flap vascularity was checked, and the operation was completed. After one month, the pedicled portion extending into the cheek was trimmed. During one year of follow-up, no complications occurred, and stable closure was achieved.

3. Discussion

Although OAC closure surgeries generally yield high success rates, recurrence can occur. In the literature, approximately one in ten patients has been reported to experience reopening of the communication (3). Factors contributing to recurrence include large bony defects, concomitant infection or sinusitis, and a history of failed surgical interventions. In such cases, closure becomes more challenging, and flap techniques providing additional tissue support are recommended (2).

First described by Bozola in 1989 (4), buccal myomucosal flaps are richly vascularized due to their pedicle based on branches of the facial and internal maxillary arterial network. They provide thin, pliable, well-vascularized tissue similar to the lost structures, offering significant reconstructive advantages. In addition, they can be harvested from the same surgical field, eliminating the need for a second surgical team, reducing operative time, and minimizing donor site morbidity with no obvious scarring (5). Their reliable vascularity and ease of preparation are regarded as the main advantages (6). However, loss of vestibular depth has been described as a limitation (7).

Buccal myomucosal flaps are therefore considered an effective and reliable option in cases where first-line surgical methods are insufficient, particularly in the closure of large and recurrent defects (8). Previous reports have also emphasized their success following failed surgical attempts (7). The absence of complications during long-term follow-up in the present cases supports the efficacy of this technique and is consistent with the high success rates reported in the literature (2).

4. Conclusion

Buccal myomucosal flaps are a reliable option for the closure of large and recurrent oroantral communications due to their rich vascularity and single-stage surgical applicability. In both cases presented, successful outcomes were achieved despite previous failed attempts.

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SS-125

Enucleation of Central Odontogenic Keratocysts Adjacent to the Inferior Alveolar Canal: Case Series

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1. Introduction

Odontogenic keratocysts (OKCs) are developmental cysts frequently observed in the jaws; however, they are distinguished from other odontogenic lesions by their aggressive biological behavior and high recurrence rates (1,2). Although classified as tumors by the World Health Organization (WHO) in 2005, they were reclassified as cysts in the 2017 update (3). Histopathologically, the presence of a thin, fragile epithelial lining and “satellite cysts” within the cyst wall are considered the primary causes of their high recurrence potential (4).

OKCs are most commonly located in the posterior mandible and are often asymptomatic, leading to their incidental detection (5). Their tendency for growth is clinically significant due to the risk of invasion toward critical anatomical structures such as the inferior alveolar canal (IAC). The close proximity of OKCs to the IAC increases the risk of nerve injury during surgery, potentially resulting in paresthesia or anesthesia (6). The management of OKCs is determined by their aggressive nature and recurrence tendency. Because of the high recurrence rates (20–60%) reported with enucleation alone, adjuvant treatments such as cryotherapy or Carnoy's solution are frequently employed (7,8). However, in lesions located adjacent to critical anatomical structures like the IAC, the use of these adjuvant modalities requires careful evaluation due to the risk of nerve damage (9). In this context, Modified Carnoy's solution—obtained by removing chloroform from the classical formulation—is recommended as an adjunctive chemical fixative agent for residual cells after enucleation of odontogenic cysts and tumors (10).

This case report describes the successful management of two central OKCs located in close proximity to the IAC, using enucleation combined with Modified Carnoy's solution, while minimizing the risk of nerve injury. This report aims to provide guidance for surgical decision-making and risk management in similarly challenging cases.

2. Case Reports**Case-1**

A 20-year-old female patient with a history of renal transplantation, hydrocephalus, and meningocele presented to our clinic with swelling in the left posterior mandible. Due to her immunocompromised status, careful management was required. Intraoral examination revealed a fluctuant swelling upon buccal and lingual palpation. Cone-Beam Computed Tomography (CBCT) showed a unilocular radiolucent lesion (42x24x18 mm) extending from the region of tooth #37 to the mandibular ramus (Fig-1). Cortical expansion and thinning were present, though no perforation was noted. Fine-needle aspiration biopsy yielded a characteristic yellow, cheesy fluid. A provisional diagnosis of OKC was made, and surgical removal under general anesthesia was planned.

A crestal incision was performed, and a mucoperiosteal flap was elevated. The cystic lesion was carefully separated from surrounding bone and removed in two pieces. The specimen was submitted for histopathological examination. The cyst cavity walls were curetted and irrigated with sterile saline. After isolating the IAC, gauze soaked with Modified Carnoy's solution was applied to the cavity walls for 3 minutes. The cavity was then thoroughly irrigated with saline to neutralize the solution. Hemostasis was achieved, and primary closure was performed with 3/0 silk sutures. Histopathological analysis confirmed the diagnosis of OKC. Postoperative follow-ups revealed no complications.

Case-2

A 26-year-old systemically healthy male patient was referred to our clinic following detection of a fluctuant swelling in the left posterior mandible during routine dental examination. CBCT imaging revealed a multilocular cystic lesion (43x16x17 mm) extending into the mandibular ramus, associated with the impacted mandibular third molar (#38). With a provisional diagnosis of OKC, surgery under local anesthesia was planned.

A crestal incision was made, and a mucoperiosteal flap was elevated. The cystic lesion was dissected from the surrounding tissue and removed in one piece. The specimen was sent for histopathological evaluation

(Fig-2). The cyst cavity walls were curetted and irrigated with sterile saline. After isolating the IAC, gauze soaked in Modified Carnoy's solution was applied to the cavity walls for 3 minutes. Hemostasis was achieved, and primary closure was performed with 3/0 silk sutures. Histopathological findings confirmed the diagnosis of OKC. No postoperative complications were noted.

3. Discussion

The management of OKCs remains a complex and debated issue due to their unique biological behavior. Enucleation alone is associated with high recurrence rates (20–60%); therefore, the adjunctive use of Carnoy's solution is frequently recommended (3,4). This approach eliminates residual epithelial cells and can reduce recurrence rates to below 10% (7).

In our cases, despite the close proximity of the lesions to the IAC, Modified Carnoy's solution was applied following enucleation in order to minimize recurrence risk. The rationale for this approach lies in prioritizing the aggressive biological behavior and recurrence potential of OKCs over the possible risk of surgical complications. Nonetheless, the neurotoxic effects of Carnoy's solution, including the risk of permanent paresthesia or anesthesia, are well documented (8).

Modified Carnoy's solution, developed by removing chloroform due to its potential carcinogenicity and neurotoxicity, is widely used after surgical enucleation of lesions with high recurrence potential such as OKCs. Its safety profile is superior to the classic formulation. Reports in the literature suggest that Modified Carnoy's solution can be safely applied in the mandible, even near the IAC, while significantly reducing recurrence rates in long-term follow-ups. However, limiting the application time to 1–3 minutes is crucial to prevent damage to adjacent soft tissues (10,11).

Another critical factor is surgical technique. The success of surgical treatment depends on meticulous preoperative planning and intraoperative management. In our cases, CBCT imaging provided precise localization of the lesion's relationship with the IAC, guiding careful enucleation. The most critical step was protecting the nerve during application of Modified Carnoy's solution. For this purpose, a physical barrier such as saline-soaked gauze was placed between the nerve and the bony cavity. The solution was applied only to the cystic walls for approximately 3 minutes and subsequently neutralized with copious saline irrigation (9).

In postoperative follow-up, no neurological deficits were observed in either patient. This outcome highlights that, with precise surgical technique and careful risk management, potentially neurotoxic agents can be used safely. These cases demonstrate that recurrence prevention and nerve preservation are not mutually exclusive goals, and that careful case selection and surgical protocol can achieve both objectives.

Recurrence of OKCs can occur even years after initial treatment (3). Therefore, surgical success should not be evaluated solely based on short-term outcomes. Patients must be recalled for periodic clinical and radiographic evaluations—every 6 months during the first year and annually thereafter—to enable early detection of potential recurrences.

The main limitation of this report is its small sample size, as it includes only two cases. Additionally, because OKC recurrences can manifest even years later, long-term outcomes of these cases cannot yet be fully assessed. Thus, further studies with larger cohorts and extended follow-up periods are necessary to validate these findings.

4. Conclusion

The treatment of central OKCs adjacent to the IAC represents a surgical challenge due to the lesion's aggressive nature and the risk of nerve injury. These case reports demonstrate that enucleation combined with Carnoy's solution can be safely performed with meticulous surgical technique and thorough preoperative planning to minimize recurrence rates. In our cases, the use of protective barriers and careful dissection prevented postoperative complications such as paresthesia or anesthesia. These findings highlight that, in experienced hands, even aggressive pathologies can be managed successfully with surgical strategies that balance recurrence prevention and preservation of patient quality of life.

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SS-126

ODONTOGENIC KERATOCYST: TWO DIFFERENT CASE REPORTS

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Abstract

Objective: Odontogenic keratocyst is one of the most frequently studied cysts due to its high recurrence rate and aggressive clinical behavior. While observable across all age groups, it predominantly appears more frequently during the second and fourth decades of life. These lesions, which occur approximately twice as frequently in the mandible compared to the maxilla, are predominantly located in the posterior region, specifically in the angle and ascending ramus. Due to the presence of a thin and fibrous cyst epithelium, it poses challenges for enucleation and contains satellite cysts within its structure.

Case Reports: Case 1: An enucleation procedure was performed to remove a lesion diagnosed as odontogenic keratocyst in a 60-year-old male patient. The lesion extended from the right mandibular angle to the ascending ramus and involved the impacted tooth number 48. The impacted third molar and adjacent teeth associated with the cyst were extracted. Three tubes of Concentrated Growth Factor (CGF) were applied to the affected area. To mitigate the risk of fracture, a six-hole miniplate was secured in the region.

Case 2: A 20-year-old male patient underwent enucleation of a pathological lesion diagnosed as odontogenic keratocyst, which extended from the left mandibular angle toward the ascending ramus, surrounding the impacted tooth number 48 located at the mandibular base. The impacted tooth was extracted during the same session. Five tubes of Concentrated Growth Factor (CGF) were applied to the affected area.

Conclusion: Regular follow-up in both cases showed no soft tissue dehiscence, fracture, nerve paresthesia, or recurrence. However, extended monitoring and follow-up are recommended.

Keywords: Enucleation, Concentrate Growth Factor(CGF), Odontogenic Keratocyst

1. Introduction

Odontogenic keratocyst was first described by Philipsen in 1956. It is hypothesized that the cyst originates from remnants of cells within the dental lamina(1). Odontogenic keratocysts (OKCs) account for approximately 10-20% of odontogenic cysts in terms of incidence. These lesions are characterized by a delicate, fibrous cyst wall lined with stratified epithelium and commonly harbor small satellite cysts, which complicate enucleation within the bony tissue. Due to these pathological features, OKCs demonstrate a predisposition for recurrence following therapeutic intervention(2-3). OKCs are benign cysts of odontogenic origin. However, some reports have documented cases in which the cystic epithelium undergoes malignant transformation or progresses to ameloblastoma(4-5).

OKCs may present as solitary lesions in the jawbones; however, multiple OKCs have also been associated with Nevoid Basal Cell Carcinoma Syndrome (Gorlin-Goltz syndrome), as reported in the literature(6). On radiographic evaluation, OKCs typically appear as well-defined radiolucent lesions that can be either unilocular or multilocular. Lesions located in the posterior mandible frequently surround the third molar crown, presenting radiographic features similar to dentigerous cysts(1).

Enucleation is the primary treatment approach commonly utilized for OKCs. However, for larger and more extensive lesions, surgical resection may become necessary. The fragility of the cyst epithelium and the presence of satellite cysts in the surrounding tissue can complicate the complete removal of the lesion in a single, intact specimen(7).

2. Case Reports

Case 1 : A 60-year-old male patient presented with painless expansion in the right mandibular region. It was noted that the patient has type 2 diabetes and has been a smoker for 30 years. Based on panoramic radiography and computed tomography scans, a well-defined radiolucent lesion was observed around tooth number 48, which was impacted, extending to the mandibular ramus. The lesion was diagnosed as an odontogenic keratocyst based on a biopsy specimen. A treatment plan involving enucleation was established. Under local anesthesia with adrenaline, a full-thickness mucoperiosteal flap was elevated. The cyst was removed via cystectomy, and the impacted tooth along with adjacent affected teeth was extracted. To enhance healing and reduce the risk of paresthesia, three tubes of concentrated growth factors (CGF) were placed in the site. A miniplate was also installed to eliminate fracture risk. The flap was primarily sutured. The patient was prescribed amoxicillin, NSAIDs, and chlorhexidine mouth rinse and was scheduled for follow-up sessions.

Case 2 : During a routine clinical and radiological examination of a 20-year-old male patient without any systemic diseases, a radiolucent lesion associated with an impacted third molar tooth was identified in the region of the left mandibular angle extending to the ramus. Under local anesthesia with adrenaline, a full-thickness mucoperiosteal flap was elevated. The lesion, diagnosed as an odontogenic keratocyst, was removed via enucleation. The impacted third molar was extracted. Five tubes of concentrated growth factors (CGF) were placed in the surgical site. The area was primarily closed with sutures. The patient was prescribed amoxicillin, NSAIDs, and 0.12% chlorhexidine mouth rinse. Follow-up appointments were scheduled, and the patient was enrolled in regular monitoring.

3. Discussion

Odontogenic keratocysts (OKCs) are known for their aggressive nature, high recurrence rates, and potential for recurrence despite the use of conservative treatment modalities. Enucleation remains one of the most commonly employed surgical approaches for the management of odontogenic keratocysts(7).

Studies have demonstrated that odontogenic keratocysts (OKCs) treated solely with enucleation exhibit a recurrence rate of approximately 25%. However, when enucleation is combined with the application of Carnoy's solution, this rate has been reported to decrease to around 8%(8). Additionally, Nakamura et al. reported that marsupialization reduces cyst size and the extent of surgical intervention but does not significantly alter the recurrence rate of OKCs(9). Recurrences following resection are observed in about 2% of cases. Recurrences are generally associated with the incomplete removal of satellite cysts. In cases involving extensive lesions, marsupialization can be followed by enucleation to improve outcomes (10).

In the present review, enucleation was employed as the first-line therapeutic approach and was associated with favorable outcomes in the majority of cases. The effectiveness of this modality is intricately

linked to meticulous surgical technique, emphasizing complete lesion removal to significantly diminish the risk of recurrence.

4. Conclusion

In conclusion, enucleation remains a feasible and effective treatment modality for odontogenic keratocysts, particularly when combined with adjunctive therapies and meticulous surgical techniques. To establish standardized protocols that minimize recurrence while preserving functional and aesthetic outcomes, further studies with larger sample sizes and long-term follow-up are necessary.

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CENTRAL GIANT CELL GRANULOMA OF THE MAXILLA: A CASE REPORT

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Abstract

Objective: Central giant cell granuloma (CGCG) is an intraosseous lesion of the jawbones, generally benign but capable of exhibiting local destruction. First described by Jaffe in 1953, it presents in aggressive and non-aggressive forms. Its pathogenesis remains controversial in the literature. This case report aims to evaluate the importance of laboratory and imaging methods in differentiating CGCG from Brown tumor, and to comprehensively review its clinical, radiological, histopathological features, treatment modalities, and recurrence based on current literature, through an atypical aggressive maxillary CGCG case in a 63-year-old male.

Case: A 63-year-old male presented with a two-month history of swelling in the right maxilla and incompatibility of his removable prosthesis. Clinical examination revealed a painless swelling in the anterior-premolar region of the right maxillary alveolar ridge, mobility of tooth 11, and cortical bone destruction. Computed tomography demonstrated a multilocular osteolytic lesion consistent with previously reported findings by Zhang et al. Incisional biopsy suggested peripheral giant cell granuloma; however, excisional biopsy, in accordance with Carver et al., confirmed the diagnosis of CGCG. Radical excision of the lesion and extraction of tooth 11 were performed. To exclude Brown tumor, biochemical and endocrine tests including parathyroid hormone, calcium, and alkaline phosphatase were conducted as recommended by Vered et al. No recurrence was observed during six months of follow-up.

Conclusion: CGCG may present with maxillary involvement and aggressive behavior in older male patients, differing from classical demographic characteristics reported in the literature (6,7). As emphasized by Vered et al. (5), biochemical tests and radiological imaging are essential to exclude Brown tumor in the diagnosis of CGCG. Radical surgery has been shown to be effective in reducing recurrence in aggressive lesions, as reported by Carver et al. (4). According to Lange et al. (8), a multidisciplinary approach (pathology, radiology, endocrinology) improves diagnostic and therapeutic success.

Keywords: Central giant cell granuloma, Brown tumor, maxillary granuloma

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MAKSİLLADA SANTRAL DEV HÜCRELİ GRANÜLOM: BİR VAKA SUNUMU

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Özet

Amaç: Santral dev hücreli granüлом (SDHG), çene kemiklerinde görülen, genellikle benign ancak lokal yıkımla seyredebilen intraosseöz bir lezyondur. Literatürde ilk kez Jaffe tarafından 1953 yılında tanımlanınan (1) bu lezyon, klinik olarak agresif ve non-agresif formlarda görülür. Literatürde patogenezinin hala tartışımlı olduğu bildirilmiştir (2). Bu vaka sunumunda 63 yaşında erkek hastada üst çenede agresif seyir gösteren atipik bir santral dev hücreli granüлом (SDHG) vakası üzerinden, SDHG'nin Brown tümör ile ayırcı tanısında laboratuvar ve görüntüleme yöntemlerinin önemini tartışmak, klinik, radyolojik, histopatolojik, tedavi ve nüks özelliklerini literatür derlemesi ile kapsamlı biçimde incelemek amaçlanmıştır.

Vaka: 63 yaşında erkek hasta, 2 aydır sağ üst çenede şişlik ve hareketli protezinde uyumsuzluk şikayeti ile kliniğimize başvurmuştur. Sağ maksiller alveol kretin anterior-premolar bölgesinde ağrısız şişlik, 11 numaralı dişte mobilite, kortikal kemikte destrüksiyon bulguları tespit edilmiştir. Yapılan tomografik incelemede Zhang ve ark. (3) tarafından literatürde bildirilen olgulara paralel olarak multiloculer osteolitik lezyon tespit edilmiştir. İnsizyonel biyopsi sonucu periferal dev hücreli granüloomdan şüphelenilmiş olup, akabinde Carver ve ark. (4) tarafından literatürde bildirilen çalışmalara paralel olarak yapılan eksizyonel biyopsi sonucu SDHG tanısı konulmuştur. Lezyonun radikal eksizyonu ve 11 numaralı dişin çekimi yapılmıştır. Tanıda Brown tümörü ekarte etmek için Vered ve ark. (5) tarafından literatürde vurgulanan bildirilere paralel olarak parathormon, kalsiyum, alkalen fosfataz gibi biyokimyasal ve endokrinolojik testler yapılmıştır. 6 aylık takipte herhangi bir nüks gözlenmemiştir.

Sonuç: SDHG, literatürde belirtilen klasik demografik özelliklerin (6,7) dışında yaşlı erkek hastada, maksiller tutulum ve agresif seyir gösterebilir. Vered ve ark. (5) tarafından literatürde vurguladığı üzere SDHG tanısında Brown tümörü ekarte etmek için biyokimyasal testler (parathormon, kalsiyum, alkalen fosfataz) ve radyolojik görüntüleme şarttır. Agresif lezyonlarda radikal cerrahinin, nüks riskini azaltmada etkili olduğu Carver ve ark. (4) tarafından bildirilmiştir. Lange ve ark. (8) multidisipliner yaklaşımın (patoloji, radyoloji, endokrinoloji) tanı ve tedavi başarısını artırdığını vurgulamıştır.

Anahtar Kelimeler: Santral dev hücreli granüлом, Brown tümör, maksiller granüлом

Giriş

Santral dev hücreli granüлом (SDHG), çene kemiklerinin medüller kısmında gelişen, çok çekirdekli dev hücreler ve fibroblast benzeri stromal hücrelerden oluşan, lokal olarak yıkıcı bir lezyondur (9). WHO sınıflamasına göre benign ancak agresif potansiyel gösterebilen non-odontojenik tümörler arasında yer alır (5).

Santral dev hücreli granüлом (SDHG), ilk kez 1953 yılında Jaffe tarafından uzun kemiklerin epifizlerinde görülen dev hücreli tümörlerden, histolojik benzerlik göstermesine rağmen ayrı bir antite olarak tanımlanmıştır. Jaffe, bu lezyonların neoplastik olmaktan ziyade lokal bir reaktif proliferasyon olduğunu savunmuş ve "dev hücreli reparatif granüлом" terimini önermiştir (1). Bu kavram bazı araştırmacılar tarafından da desteklenerek literatürde yerleşmiştir (10). Fakat "dev hücreli reparatif granüлом" terimi lezyonun esas olarak yıkıcı bir süreç göstermesi nedeniyle artık kullanılmamaktadır (11,12).

Literatürde dev hücreli granüloomlar, çenelerde santral dev hücreli granüлом ve periferal dev hücreli granüлом olarak iki şekilde bildirilmiştir (13). Araştırmacılar santral dev hücreli granüloomun kemikten gelişmekteyken, periferal dev hücreli granüloomun dişeti ve alveolar proses üzerinde meydana geldiğini bildirmiştir (14).

Literatürde SDHG vakalarının %60'ından fazlasının 30 yaş altı bireylerde gözlendiği bildirilmiştir (6).

Kadın/erkek oranı yaklaşık 2:1'dir. Mandibula maksillaya göre daha sık tutulur. Aliu ve ark. (7) lezyonlarının %70'i anterior bölgede, sıklıkla orta hatta lokalizasyon gösterdiğini bildirmiştir. Carver ve ark. (4) tarafından bildirilen sonuçlar, çocukluk çağında görülen olguların daha hızlı büyümeye eğiliminde olduğunu, agresif formda seyredebildiğini göstermektedir.

Hastalar genellikle ağrısız şişlik, yüz asimetrisi veya dişlerde yer değişitirme şikayetleriyle başvurur.

Literatürde agresif olgularda ağrı, kortikal destrüksiyon, parestezi ve diş kökü rezorpsiyonu bildirilmiştir (2).

Radyografide lezyonlar unilocüler veya multilocüler radyolusent alanlar olarak görülür. Multilocüler form "bal peteği" veya "sabun köpüğü" görünümüyle tanımlanır (3). Radyolojik görüntüsünün patognomik olmaması nedeni ile çenelerde görülen diğer birçok lezyonla karışabilmektedir. Lange ve ark. (15) ayırcı tanıda Brown tümör, anevrizmal kemik kisti ve cherubizm gibi patolojilerin düşünülmesi gerektiğini bildirmiştir. Cohen ve ark. (16) tarafından, SDHG'nin çenelerin benign lezyonları arasında %7'den daha az bir sıklıkta görülmekte olduğu bildirilmiştir. Klinik olarak agresif olmayan ve agresif seyirli iki farklı formda karşımıza çıkabilir. Literatürde agresif olmayan formun yavaş büyüyen, ağırsız şişlik ve fascial asimetri ile karakterize olduğu ve vakaların %80'ini oluşturuğu rapor edilmiştir (17). Yapılan çalışmalar agresif formunun ise hızlı büyümeye, kemik korteksinde destrüksiyon, komşu diş köklerinde rezorpsiyon, nüks eğilimi ve mandibular kanal, maksiller sinüs tabanı gibi anatomik yapılarda yer değiştirmeler ile seyredebildiğini göstermiştir (18). Agresif lezyonlara genç hastalarda daha sık rastlandığı literatürde bildirilmiştir (17).

Literatürde SDHG histolojik olarak fibroblastik stromada dağılmış çok çekirdekli dev hücreler, hemosiderin birikimi ve fokal hemorajî alanlarıyla karakterizedir (9). Stromal hücreler RANKL ve M-CSF salgılayarak monositlerin osteoklast benzeri hücrelere farklılaşmasını tetikler. Bu durum, kemik yıkımına yol açar (2). Moleküler düzeyde c-fos, TNF- α , IL-6 ve MMP-9 gibi faktörlerin ekspresyonu SDHG agresifliğinde etkili bulunmuştur (19). Literatürde Cherubizm ve hiperparatiroidiye bağlı brown tümörlerle benzer patolojik özellikler sergilediği için ayırcı tanının önemli olduğu vurgulanmaktadır (5).

Literatürde benzer olgular incelendiğinde (4) cerrahi, en sık uygulanan tedavi yöntemidir. Küretaj, enükleasyon veya segmental rezeksiyon uygulanabilir. Araştırmacılar küçük, non-agresif lezyonlarda konservatif cerrahiyi; agresif, nüks eden olgularda radikal cerrahiyi önermiştir (7). Intralezyonel steroid tedavisi Jacoway ve ark. (1988) tarafından tanıtılmıştır. Metilprednizolon enjeksiyonu ile osteoklastik aktivitenin baskılanması amaçlanır. Literatürde çocuklarda cerrahi morbiditeyi azaltmak için tercih edildiği rapor edilmiştir (2). Literatürde diğer bir medikal tedavi olarak Ramesh ve ark. (9) kalsitonini, osteoklast fonksiyonlarını inhibe etmek amacıyla bildirilmiştir. Nazal sprey veya subkutan formda uygulanır. Lezyon küçülmesi bildirilen olgular vardır ancak tedavi süresinin uzun olduğu bildirilmiştir. Interferon- α anti-anjiyogenik etkisiyle vasküler proliferasyonu baskılamaktadır. Genellikle steroid veya kalsitonin tedavisine yanıt alınamayan agresif olgularda kullanıldığı rapor edilmiştir (19). Denosumab (RANKL inhibitörü) RANKL'ı bloke ederek osteoklastik aktiviteyi inhibe eder. Literatürde özellikle cerrahi uygulanamayacak agresif lezyonlarda etkili olduğu bildirilmiştir (7) ancak çocuklarda hipokalsemi, rebound rezorpsiyon ve mandibular osteonekroz gibi komplikasyonlar da rapor edilmiştir (5). Benzer vakalar incelendiğinde radyoterapi nadir kullanılan bir tedavi olmuştur. Malign dönüşüm riski nedeniyle yalnızca tekrarlayan ve rezeksiyona uygun olmayan olgularda tercih edildiği bildirilmiştir (3).

Literatürde nüks oranları %11 ile %49 arasında rapor edilmiştir (4). Agresif form, geniş lezyon çapı, multilocüler yapı ve yetersiz cerrahi sınırın nüks riskini artırdığı bildirilmiştir (7). Ramesh ve ark. (9) tarafından uzun dönemde (≥ 5 yıl) klinik ve radyolojik takip önerilmiştir.

SDHG; dev hücreli tümör, aneurysmal kemik kisti, brown tümör ve cherubizm ile karışabilir. Literatürde serum kalsiyum, fosfat ve parathormon düzeylerinin mutlaka değerlendirilmesi ve hiperparatiroidizm faktörünün dışlanması gereği bildirilmiştir (5).

Son yıllarda moleküler biyoloji alanında yapılan çalışmalar, SDHG'nin neoplastik özellikler gösterebileceğini düşündürmektedir (19). RANKL inhibitörlerinin (denosumab) konservatif tedavideki etkinliği umut verici olmakla birlikte, uzun dönem güvenlik çalışmaları yetersizdir (7).

Literatür tarandığında tanı sürecinde detaylı klinik öykü, laboratuvar testleri ve görüntüleme bulgularının bir arada değerlendirilmesi gereği vurgulanmıştır (15,20). Araştırmacılar hastaların uzun süreli takibinin nüks riski açısından önemli olduğunu ve özellikle agresif formlarda cerrahi sonrası yıllık radyolojik kontrollerin önerildiği bildirilmiştir (21).

Vaka sunumu

63 yaşında erkek hasta yaklaşık 2 aydır sağ alveolar kretin üstünde şişlik ve hareketli protezinde uyumsuzluk şikayetleri ile kliniğimize başvurmuştur. Yapılan fiziki muayenesinde sağ alveolar krette kanin-premolar bölgesinde ağırsız şişlik tespit edilmiştir. Oral muayenesinde 11 numaralı dişte mobilite, sağ üst alveolar krette destrüksiyon ve sağda sert damağı tutan ağırsız, sınırları düzensiz olan yaklaşık 2 cm boyutlarında, üzerindeki mukozada fistül oluşumu olan (Resim 1), bilgisayarlı tomografisinde 22x18x12 mm boyutlarında kitle saptanmıştır (Resim 2,3).

Ağız içindeki kitleden yapılan insizyonel biyopsinin (Resim 4) patoloji sonucu periferal dev hücreli granüloma olarak rapor edilmiştir. Sonrasında kitle total olarak lokal anestezi altında eksize edilmiş ve mobil olan 11 numaralı dişin çekimi gerçekleştirılmıştır (Resim 5,6,7,8). Eksizyonel biyopsi sonucu lezyon santral

dev hücreli granülom ile uyumlu olarak rapor edilmiş olup; Brown tümörle ayırcı tanısı yapılması için hasta cerrahi sonrası biyokimya tetkikleri için endokrinolojiye yönlendirilmiştir.

İstenilen laboratuvar tetkikleri sonuçları: Alkalen Fosfataz: 59 U/L (40-150), Kalsiyum: 10,3 mg/dL (8,2-10,4), Fosfor: 2,0 mg/dL (2,5-4,6), PTH: 120,5 pg/mL (17-90) şeklinde gözlenmiştir. Boyun ultrasonografı görüntülemesinde tiroid bezi parankimi hafif heterojen izlenmiştir. Her iki lobda büyüğü sağda 7x5mm boyutunda ölçülen düzgün sınırlı birkaç adet hipoekoik solid nodüler lezyon izlenmiştir. Bilateral jugulodigastrik bileşkede büyüğü solda 21x10mm boyutunda ölçülen korteksi difüz hafif kalınlaşmış ovoid şekilli reaktif özellikle olduğu düşünülen birkaç adet lenf nodu izlenmiştir. Hastanın üst batın MRG incelemesinde sol surrenal gland lojunda 50x50mm boyutlarında kistik sinyaller görüntülenmiştir. Hastanın 6 aylık takibinde nüks gözlenmemiştir (Resim 9,10).

Tartışma

SDHG, etiyolojisi bilinmeyen neoplastik olmayan proliferatif bir lezyon olarak literatürde bildirilmiştir. Yaygın olarak kadınlarda görülmekte olduğu, maksilladan ziyade mandibulada daha sık ortaya çıktıgı, aynı zamanda genellikle yavaş büyüyen bir lezyon olduğu rapor edilmiştir (22). Bizim vakamızda ise aksine erkek hastada, maksillada kısa sürede agresif klinik seyir göstererek büyüyen bir lezyon saptanmıştır. Genellikle 30 yaş altı bireylerde rapor edilen SDHG (14), bizim vakamızda 63 yaşında bir hastada görülmektedir.

Literatürde SDHG'nin histolojik özelliklerinin hiperparatroidizmin Brown tümörü ile ayırt edilemediği bildirildiği için (15,20) doğru bir tanı ve tedavi adına hasta endokrinolojiye yönlendirilerek kan biyokimya tetkikleri istenmiştir. Laboratuvar sonuçlarına göre parathormonda anlamlı bir yükselme görülmezken, diğer serum seviyeleri normal değerlerdedir. Ayrıca endokrinoloji konsültasyonu sonucu hastanın dahili branşlarda üst batın MRG incelemesi istenmiş ve sol surrenal gland lojunda 50x50mm boyutlara ulaşan kistik yapı tespit edilmiştir.

Araştırmacılar SDHG tedavisinde lezyonlar küçük ise cerrahi küretajı önermiştir ancak nüks ihtimali vardır (7). Lezyon büyükse ve korteksi içeriyeysa radikal eksizyonun en iyi tedavi seçenekleri olduğu bildirilmiştir (23). Bizim vakamızda da olduğu gibi agresif klinik öyküsü ve kortikal kemikte inceleme nedeniyle dış çekimi gerekli olabilir. Literatürde ameliyattan sonra, ilk ameliyat sonrası dönemde nüks oranının %13 ile %22 arasında olduğu rapor edilmiştir (24). Literatüre bakıldığından çenelerin SDHG'sinin tedavisi için, intralezyonel steroidler, deri altı veya nazal kalsitonin, protein tirozin kinaz inhibitörü gibi çeşitli cerrahi olmayan yaklaşımlar görülebilmektedir. Bununla birlikte bu tekniklerin etkili olup olmadığını belirlemek için literatürde yeterli veri yoktur (25,26). Tüm bu faktörler, küretajla birlikte lezyonun radikal bir eksizyonunu yapmamıza neden olmuştur. Uygulanan tedavi sonrasında 6 aylık takipte herhangi bir nüks gözlenmemiştir. Sonuç

Çok çekirdekli dev hücrelerin varlığı ile tanımlanan dev hücre bakımından zengin lezyonlar, çeşitli iyi huylu, neoplastik olmayan olguları kapsar. Literatürde tedavi kararlarına rehberlik etmek ve nüks riskini tahmin etmek için histopatolojik, görüntüleme ve moleküler analizler aracılığıyla doğru tanı koymaın kritik öneme sahip olduğu bildirilmiştir (27,28).

SDHG, çenelerin nadir görülen ancak klinikte önemli bir lezyonudur. Araştırmacılar tanı ve tedavisinde multidisipliner bir yaklaşım gerektiğini bildirmiştir (7). Sadece oral şikayetle klinijimize başvuran hastanın, endokrinoloji konsültasyonu sonucu dahili branşlarda sol surrenal gland lojunda 50x50mm boyutlara ulaşan kistik yapı tespit edilmiş ve dahiliyede bu yapıyla ilgili tedavisine devam edilmekte olup, multidisipliner yaklaşımı sonucu hastanın genel vücut sağlığıyla ilgili farkındalık kazanması sağlanmıştır.

Gelecekte, lezyonun moleküler patogenezinin aydınlatılması, hedefe yönelik tedavilerin geliştirilmesine olanak sağlayabilir.

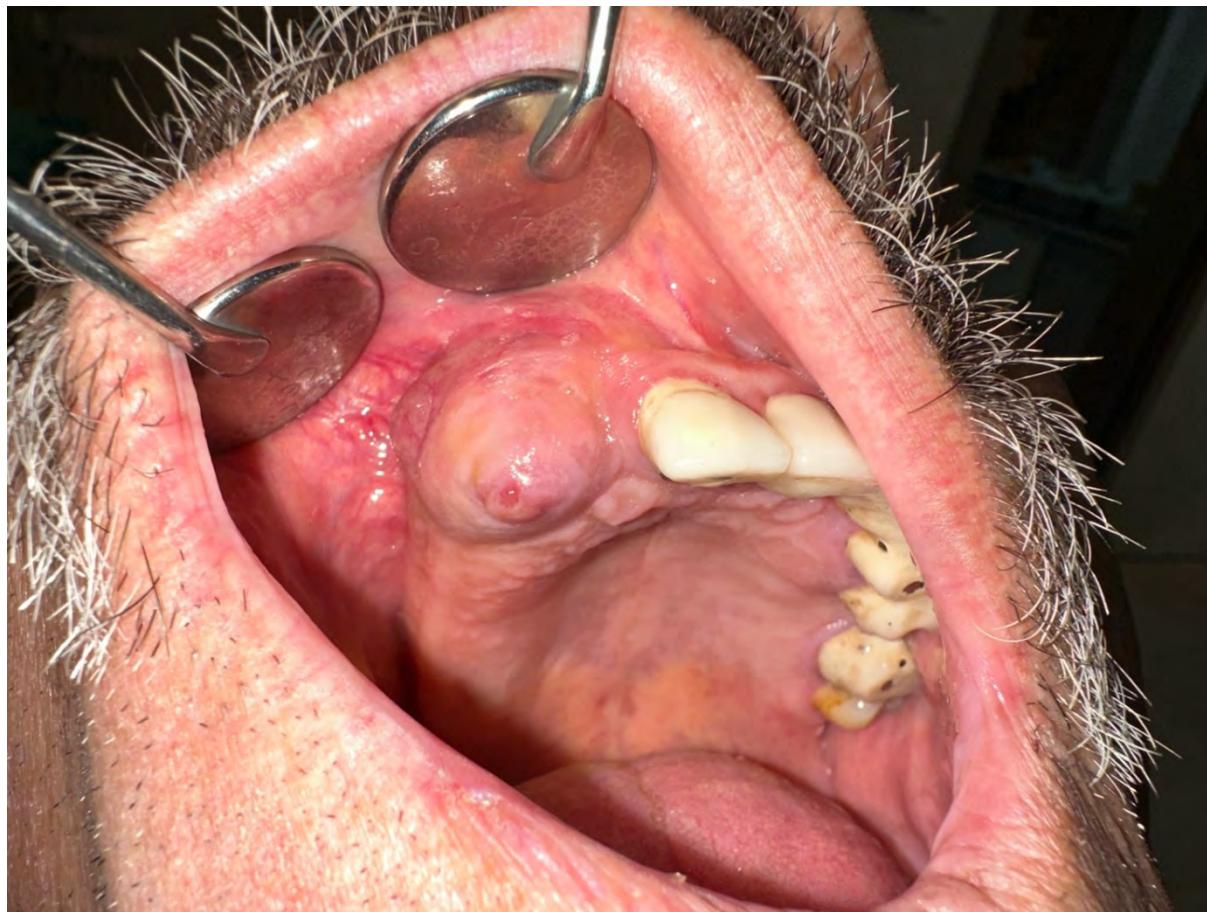
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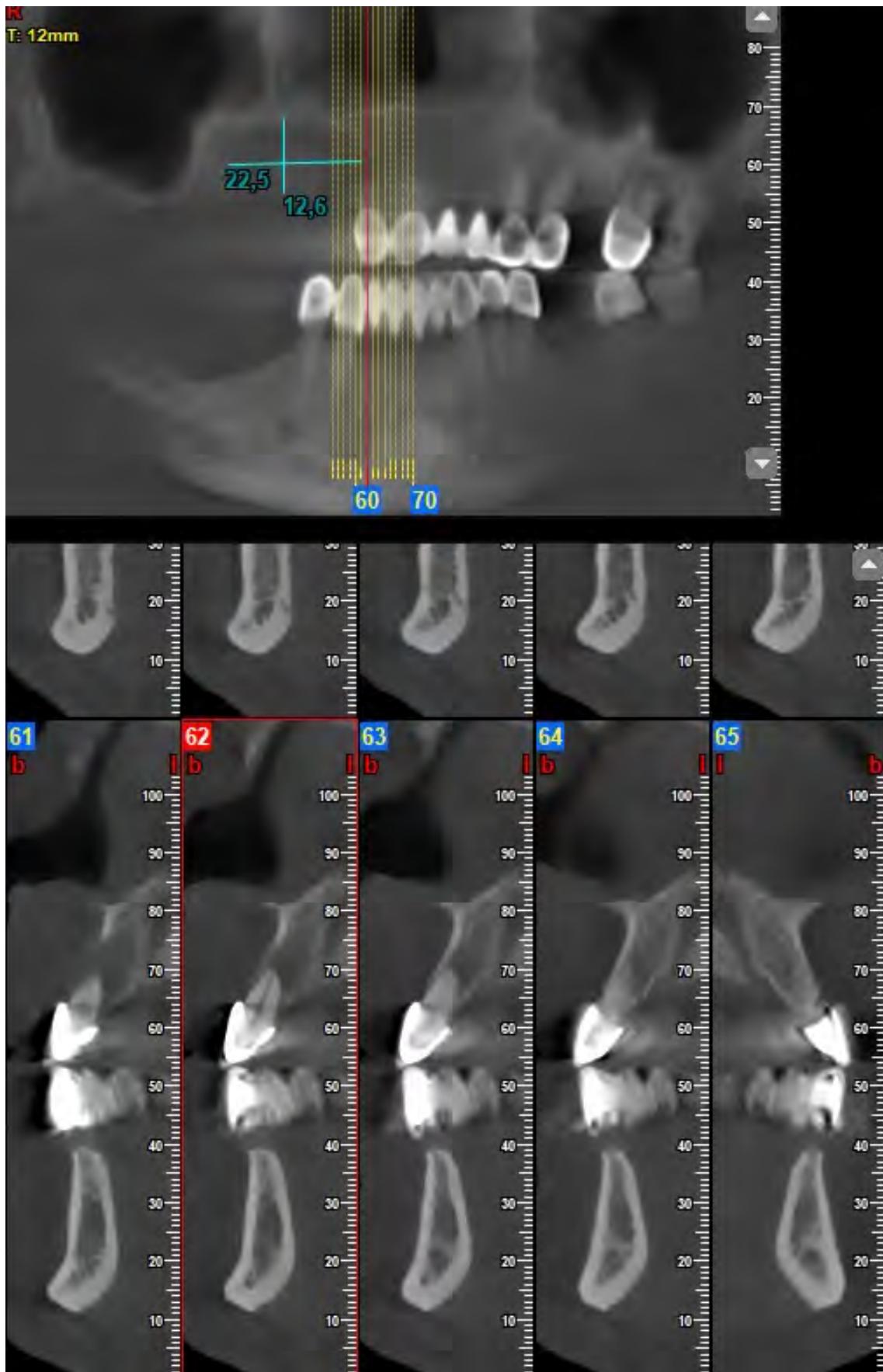
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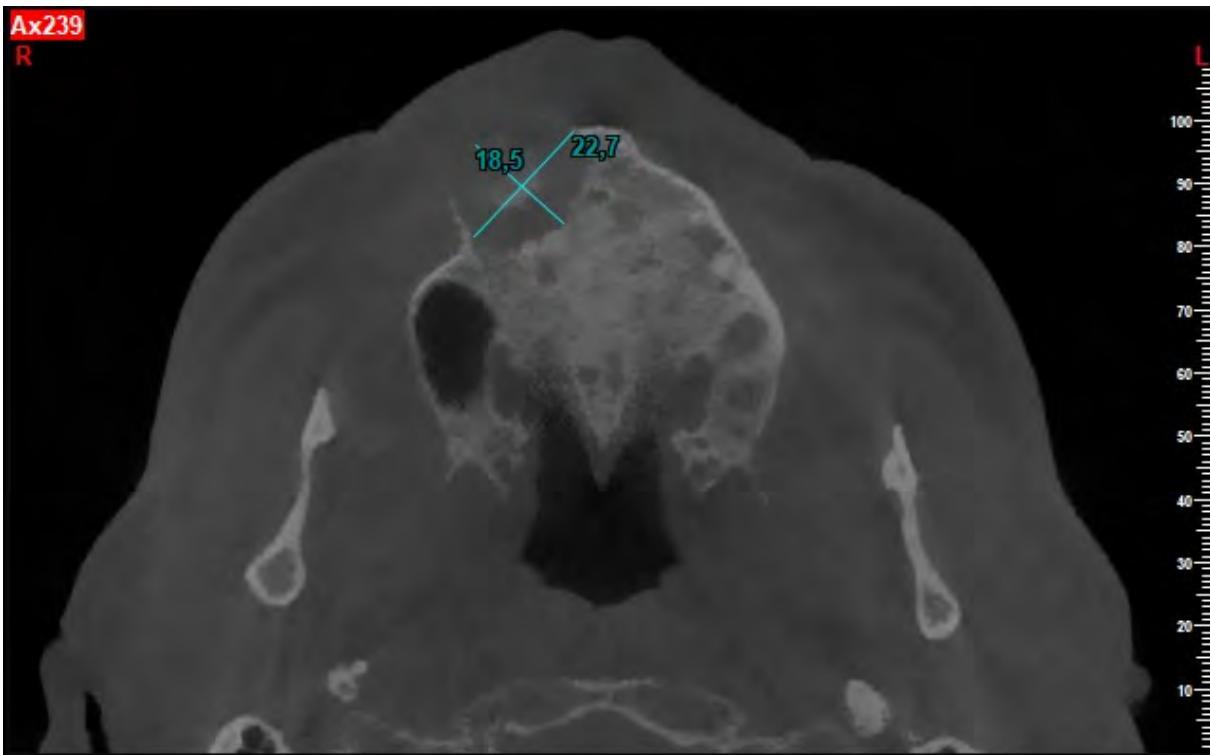
Resimler:



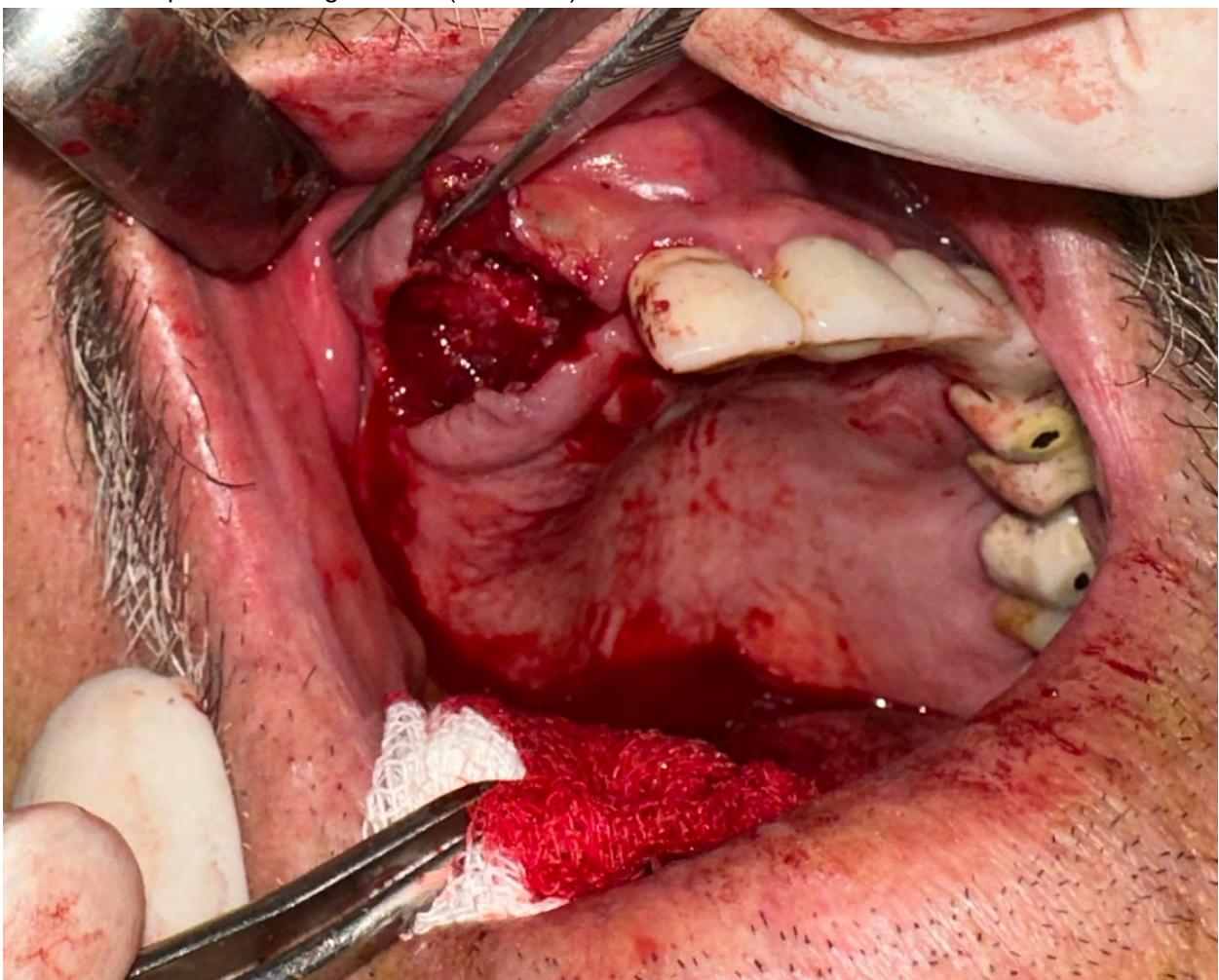
Resim 1: Preoperatif intraoral görüntü



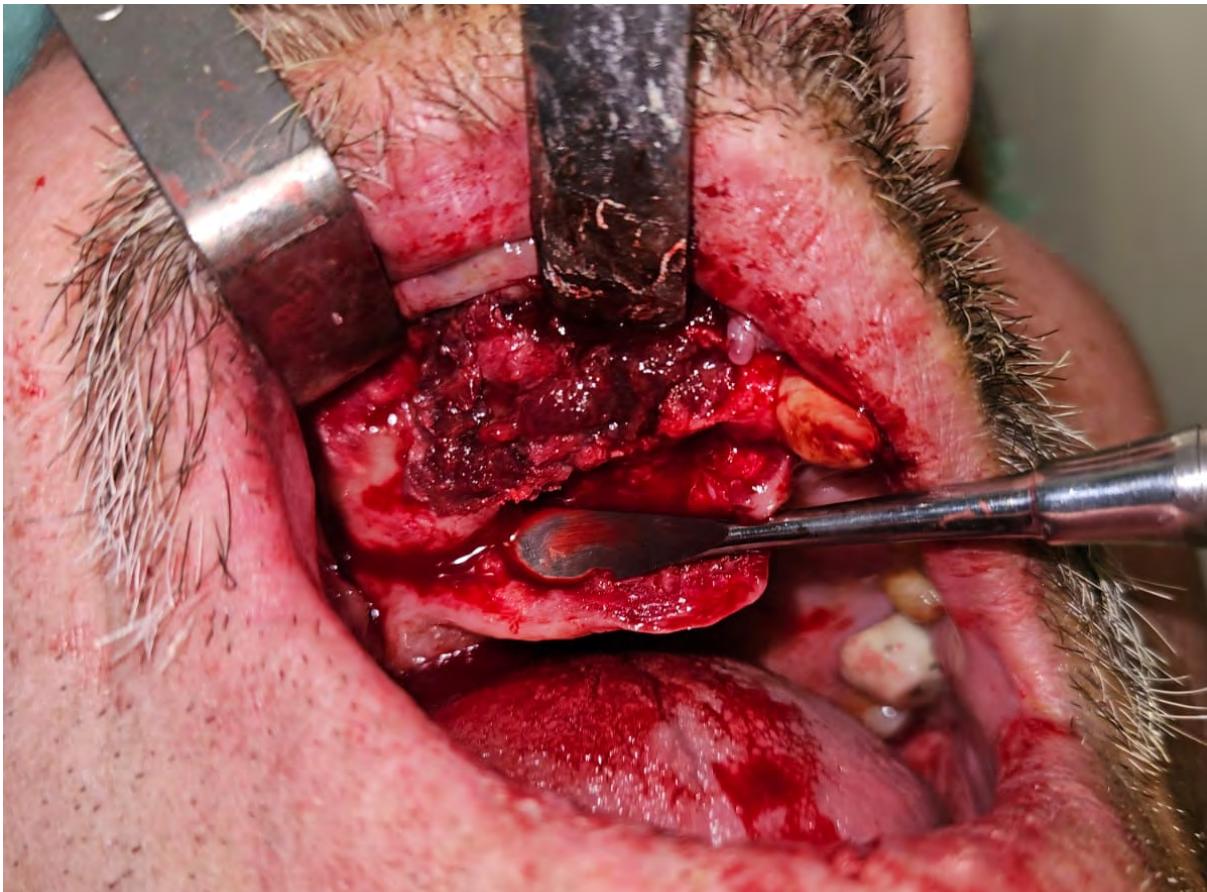
Resim 2: Preoperatif CBCT görüntüsü



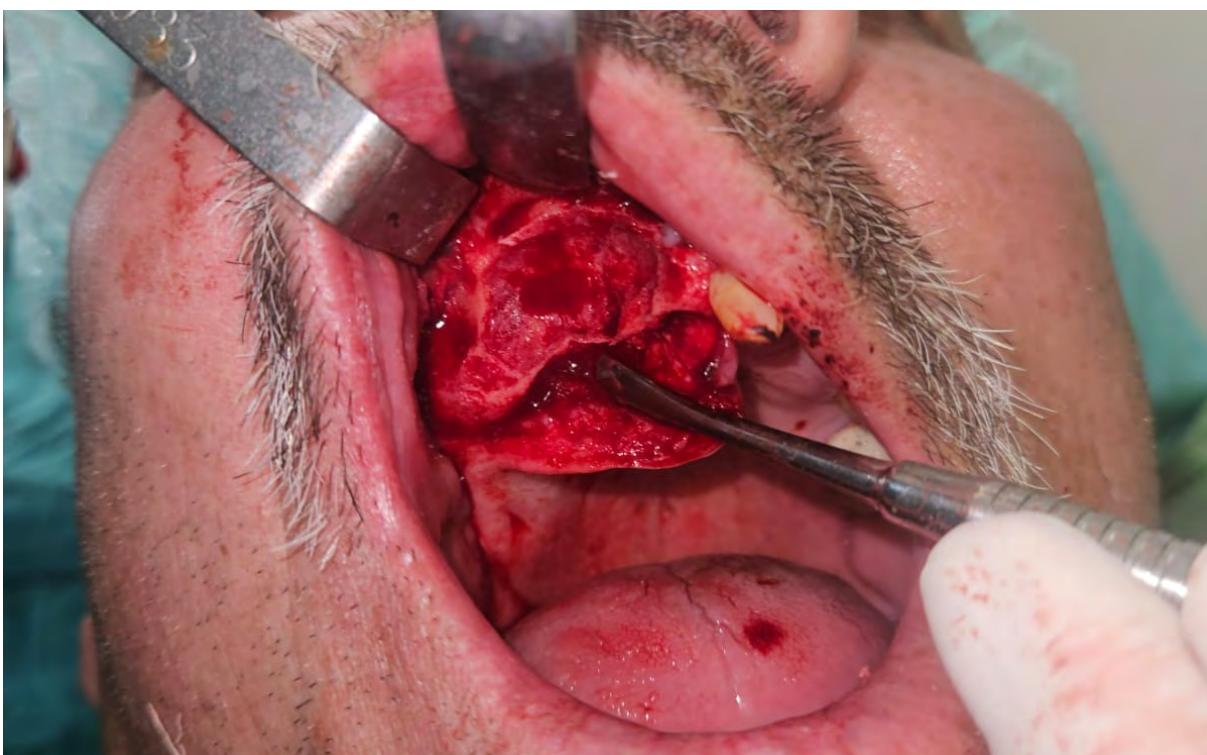
Resim 3: Preoperatif CBCT görüntüsü (horizontal)



Resim 4: İnsizyonel biyopsi görüntüsü



Resim 5: Eksizyonel biyopsi görüntüsü



Resim 6: Lezyonun küretajı sonrası görüntü



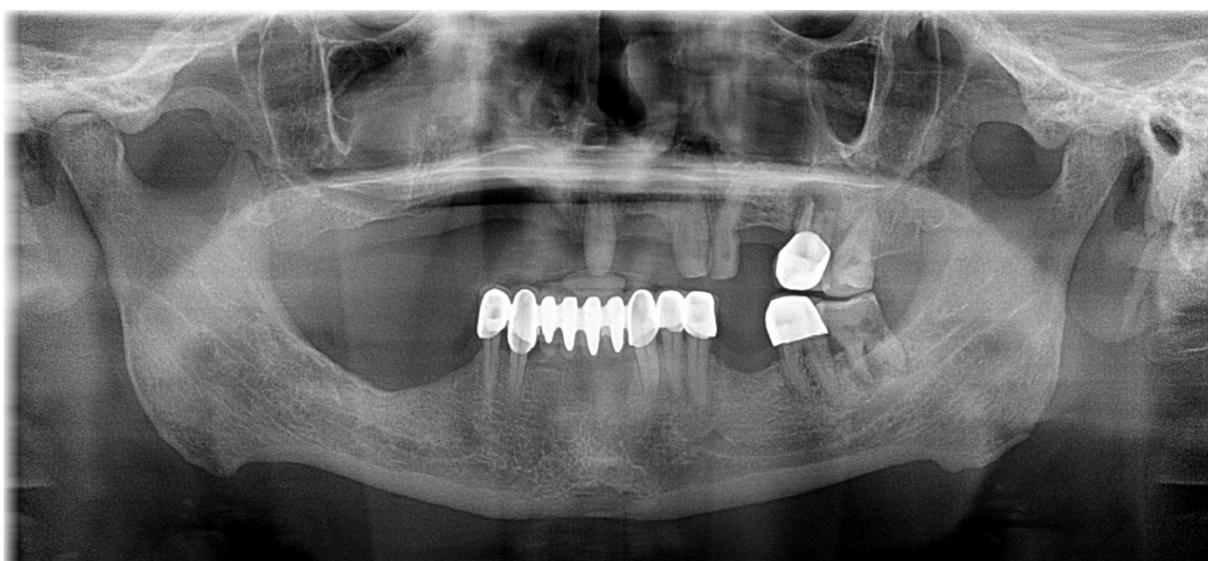
Resim 7: Eksiyonel biyopsi sonrası kavitenin irrigasyonu



Resim 8: Eksiyonel biyopsi sonrası flabin primer kapatılması



Resim 9: Postoperatif 6. ay intraoral görüntü



Resim 10: Postoperatif 6. ay panoromik görüntüsü

SS-128

SERT DAMAKTA DEV TRAVMATİK FİBROM: OLGU SUNUMU

GIANT TRAUMATIC FIBROMA OF THE HARD PALATE: A CASE REPORT

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ÖZET

Amaç

Fibromlar, bağ dokusunun iyi huylu tümörleridir ve ağız boşluğunda dil veya bukkal mukoza gibi ıslırma ve uyarılmaya açık bölgelerde sık (1) görülmelerine rağmen sert damakta oldukça nadirdir (2). Travmatik fibrom, ağız boşluğunda lokalize, neoplastik olmayan, inflamatuar hiperplastik bir fibröz bağ dokusu papülü şeklinde ortaya çıkan reaktif bir lezyondur (3). Oral yumuşak dokularda fibrom benzeri lezyonlar nispeten yüksek sıklıkla görülse de çoğu kronik irritasyona bağlı gelişen reaktif proliferasyonlardır; gerçek fibromlar ise oldukça seyrektdir (4). Sert damakta hızlı büyüterek büyük boyutlara ulaşan travmatik fibrom olguları literatürde ender bildirilmiştir.

Olgu sunumu

30 yaşında, sistemik rahatsızlığı olmayan, oral hijyeni kötü erkek hasta; sert damakta 1 yılda büyüyen, saplı, düzgün yüzeyli, sıkı kıvamlı ve iyi sınırlı, $41 \times 35 \times 25$ mm boyutunda nodül ile kliniğimize başvurdu. Lezyon literatürde Tsikopoulos ve ark. (14), Srivastava ve ark. (2) ile Jain ve ark. (28) tarafından bildirilen olgulara benzer şekilde tamamen eksize edilip tabanı koterize edildi. Histopatolojik incelemede skuamöz epitel altında kronik inflamatuar hücre infiltrasyonu ile kalın kollajen demetleri ve fibroblastlardan oluşan bağ doku izlendi. Bulgular travmatik fibrom ile uyumlu bulundu.

Sonuç

Fibromlar genellikle kronik irritasyona bağlı gelişen benign reaktif lezyonlardır (7,16). Sert damakta görülmeleri nadirdir (13). De Santana Santos ve ark. (17) 1.290 oral yumuşak doku lezyonunun %15'inin travmatik fibrom olduğunu bildirmiştir. Barker ve Lucas (7) kadınlarda daha sık görüldüğünü belirtirken, Jain ve ark. (28) erkek olgular da raporlamıştır. Burkitt'e göre fibromlar tipik olarak küçük lezyonlardır ve çapları çoğunlukla 1–1,5 cm'den küçüktür (20). Bhasker (21), Bernier (22) ve Shafer (23), oral kavitede bildirilen fibromların birkaç milimetre ile birkaç santimetre arasında değiştiğiini bildirmiştir. Bu olgu, kısa sürede büyük boyutlara ulaşmasıyla dikkat çekmektedir. Sert damakta görülen kitlelerin ayırcı tanısında travmatik fibrom göz önünde bulundurulmalı ve cerrahi eksizyon sonrası uzun dönem takip önerilmelidir.

Anahtar Kelimeler: Travmatik fibrom, sert damak, reaktif hiperplazi

Abstract

Objective

Fibromas are benign tumors of connective tissue. Although they are frequently encountered in trauma-prone areas of the oral cavity such as the tongue and buccal mucosa (1), their occurrence in the hard palate is extremely rare (2). Traumatic fibroma is a reactive lesion that presents as a localized, non-neoplastic, inflammatory hyperplastic papule of fibrous connective tissue in the oral cavity (3). While fibroma-like lesions of the oral soft tissues are relatively common, most represent reactive proliferations due to chronic irritation, whereas true fibromas are exceedingly uncommon (4). Cases of traumatic fibromas of the hard palate that rapidly enlarge to considerable sizes are rarely reported in the literature.

Case Report

A 30-year-old male patient with no systemic disease but poor oral hygiene presented with a pedunculated, smooth, firm, and well-circumscribed nodule on the hard palate that had grown over one year, measuring 41 × 35 × 25 mm. The lesion was completely excised and the base cauterized, similar to the cases reported by Tsikopoulos et al. (14), Srivastava et al. (2), and Jain et al. (28). Histopathological examination revealed fibrous connective tissue composed of thick collagen bundles and fibroblasts beneath a squamous epithelium showing chronic inflammatory cell infiltration, consistent with traumatic fibroma.

Conclusion

Fibromas are benign reactive lesions usually caused by chronic irritation (7,16). Their occurrence on the hard palate is rare (13). De Santana Santos et al. (17) found that 15% of 1,290 oral soft tissue lesions were traumatic fibromas. While Barker and Lucas (7) reported a female predominance, Jain et al. (28) also observed male cases. Typically, fibromas measure less than 1–1.5 cm (20). This case is notable for its unusually rapid growth and large size. Traumatic fibroma should be considered in the differential diagnosis of palatal masses, with long-term follow-up recommended after excision.

Keywords: Traumatic fibroma, hard palate, reactive hyperplasia

1. GİRİŞ

Fibrom, fibroblastların proliferasyonu ve kollajen lif biriminin artışı ile karakterize olan iyi huylu bir bağ dokusu tümöründür (5). Ağız boşluğunda en sık karşılaşılan benign yumuşak doku lezyonlarından biri olarak kabul edilir ve bildirilen olguların büyük çoğunluğu gerçek neoplazm değil, kronik irritasyona bağlı veya travmaya yanıt olarak gelişen reaktif hiperplazilerden oluşmaktadır (6). Genellikle tek, asemptomatik, saplı ya da sapsız lezyonlar şeklinde görülür

(7) ve en sık yaşamın dördüncü ile altıncı dekatları arasındaki bireylerde ortaya çıkar (4,7). Yetişkinlerin yaklaşık %1,2'sinde rastlanmakta ve kadınlarda daha yüksek oranda (%66) bildirilmektedir (8).

Fibromun etiyolojisi çoğunlukla kronik irritasyon ve travma ile ilişkilidir. Uygun olmayan protezler, diş taşları, taşkin restorasyonlar, keskin kenarlı kırık veya aşınmış dişler ile kişinin kendi isırması gibi faktörler irritatif fibrom gelişiminde rol oynamaktadır (7).

Tedavisi, lezyonun tamamen eksize edilmesini ve etkenin ortadan kaldırılmasını içerir (9). Rekürrens ve malign transformasyon oranı düşüktür ve çoğunlukla bölgenin tekrarlayan travmasına bağlanmaktadır (10). Oral kavitede en sık görüldüğü bölgeler dişeti, dil ve bukkal mukozadır (11). Ancak, travma ve irritasyon olasılığının daha düşük olması nedeniyle sert damakta görülmeleri oldukça nadirdir (12). Literatürde sert damakta bildirilen olgu sayısı sınırlıdır.

Bu çalışmada, yalnızca bir yıl içerisinde hızla büyüyerek dev boyutlara ulaşan nadir bir sert damak travmatik fibrom olgusu sunulmakta; klinik, histopatolojik ve tedavi süreci literatür ışığında tartışılmaktadır.

2. Olgu Sunumu

30 yaşında erkek hasta, sert damakta büyük boyutlara ulaşan kitle şikayetyle Pamukkale Üniversitesi Ağız, Diş ve Çene Cerrahisi Anabilim Dalı'na başvurdu. Hastanın öyküsünden, ön palatal bölgedeki kitlenin yaklaşık 1 yıldır mevcut olduğu, başlangıçta küçük iken zamanla artarak mevcut boyutuna ulaştığı öğrenildi. Ağrı eşlik etmiyordu, ancak çığneme ve konuşmayı etkilemesi nedeniyle rahatsızlık veriyordu. Tıbbi ve aile öyküsünde anlamlı bir özellik yoktu. Hastanın 10 yıldır günde yaklaşık on beş adet sigara kullanım öyküsü mevcuttu. İlgili bölgede travma, kanama ya da yanma gibi ek semptomlar bulunmamaktaydı. Ağız hijyeni kötüydü.

Ekstraoral muayenede herhangi bir patolojik bulguya rastlanmadı. İntraoral muayenede ise sert damağın insiziv papilla bölgesinde, santral kesicilerin hemen posteriorunda lokalize, büyük boyutlu, düzgün yüzeyli, iyi sınırlı, pediküllü ve kanamasız bir kitle gözlendi (Resim 1). Lezyon yaklaşık $41 \times 35 \times 25$ mm boyutlarında olup, palpasyonda sert kıvamlı, ağrısız ve palatal mukozaya geniş tabanlı bir sap ile bağlıydı. Servikal lenf düğümlerinde herhangi bir büyümeye veya hassasiyet saptanmadı.

Panaromik radyografide kemik destrüksiyonu görülmeli (Resim 2). Maksiller anterior okluzal radyografide yabancı cisim, patolojik kemik değişikliği veya gömülü diş rastlanmadı. Klinik ve histopatolojik açıdan ayırcı tanıda dev hücreli granülom, piyojenik granülom, nörofibrom ve benign tükürük bezi tümörü düşünüldü. Lokal anestezi altında insizyonel biyopsi alındı ve histopatolojik inceleme sonucu tanı fibrom ile uyumlu bulundu.

Daha sonra lezyon lokal anestezi altında tamamen eksize edildi. Nüksü önlemek amacıyla tabanı koterize edildi. Cerrahi sonrası kanama kontrolü sağlanarak alan sekonder iyileşmeye bırakıldı. Eksize edilen kitle $41 \times 35 \times 25$ mm boyutlarındaydı. (Resim 3). Ameliyat sonrası herhangi bir komplikasyon gelişmedi. Histopatolojik incelemede, skuamöz epitel altında kronik inflamatuar hücre infiltrasyonu ile kalın kollajen demetleri ve fibroblastlardan oluşan bağ dokusu izlendi. Bulgular travmatik fibrom ile uyumluydu. Takiplerde nüks bulgusuna rastlanmadı ve hasta herhangi bir ek şikayet bildirmedи (Resim 4,5,6)

3. Tartışma

Oral kavitede gözlenen ekzofitik lezyonların büyük çoğunluğu neoplastik değil, reaktif hiperplazilerdir. Kfir ve ark. (13), reaktif gingival lezyonları; piyojenik granülom, periferik dev hücreli granülom, fibröz hiperplazi ve kalsifiye periferik fibrom olarak sınıflandırmıştır. Fibromlar, oral kavitede en sık karşılaşılan non-neoplastik benign büyümelerden biri olup genellikle kronik irritasyon sonucu gelişmektedir (14) (15). De Santana Santos ve ark. (16),

1.290 oral yumuşak doku lezyonunun %15'inin travmatik fibrom olduğunu bildirmiştir. En sık bukkal mukozada görülürken (7), travmaya daha az maruz kalması nedeniyle sert damakta yerlesimi oldukça nadirdir (11).

Barker ve Lucas'ın (14) 650 lokalize fibröz büyümeye örneğini inceledikleri çalışmalarında bu lezyonların kadınlarda erkeklerle kıyasla daha sık gözlendiğini belirtmişlerdir. Ancak Jain ve Chnadan'ın (17,18) olgu bildirimlerinde erkek hastalarda da benzer vakalar rapor edilmiştir. Bu olgu, 30 yaşında erkek hastada rapor edilmiştir.

Burkitt'e göre fibromlar tipik olarak küçük lezyonlardır ve çapları çoğunlukla 1–1,5 cm'den küçüktür (19). Bununla birlikte, sürekli düşük dereceli irritasyonun devam ettiği olgularda lezyon birkaç santimetreye ulaşabilmektedir (20). Bhasker (21), Bernier (22) ve Shafer (23), oral kavitede bildirilen fibromların birkaç milimetre ile birkaç santimetre arasında değiştigini; Ishikawa ve ark. (24) ise bu lezyonların genellikle kırmızı fasulye ile tavuk yumurtası büyülüğu arasında değiştigini bildirmiştir. Literatürde tespit edilen 10 palatal fibrom olgusunun çoğunun ≥ 3 cm boyutunda olduğu görülmüştür (Tablo 1). Sert damakta gelişen fibromların uzun süre fark edilmemesi ve estetik veya fonksiyonel rahatsızlık yaratmaması, bu lezyonların büyük boyutlara ulaşmasının başlıca nedeni olabilir (25–27).

Sunulan olguda lezyonun boyutu $41 \times 35 \times 25$ mm olup, Tsikopoulos'un damakta 22 mm ölçülerinde fibrom bildirdiği vakayla benzerlik göstermektedir. Her iki olguda da radyografik olarak kemik tutulumuna rastlanmamıştır (12).

Ayırıcı tanıda dev hücreli granülom, piyojenik granülom, nörofibrom ve benign tükürük bezi tümörleri düşünülmelidir (28). Bu lezyonlar klinik olarak fibromu taklit edebildiğinden kesin tanı histopatolojik incelemeyle konulmalıdır. Bu olguda yapılan histopatolojik değerlendirmede, fibröz bağ dokusu içerisinde yoğun kollajen demetleri ve olgun fibroblast proliferasyonu ile çok katlı yassı epitel altında fokal hiperplazi ve hiperkeratoz izlenmiştir; bu

bulgular Barker ve Lucas'ın (14) tanımladığı irritasyon fibromu kriterleriyle uyumlu bulunmuştur.

Tedavide temel yaklaşım, lezyonun tam cerrahi eksizyonu ve irritan kaynakların ortadan kaldırılmasıdır.

Eksizyonun yetersizliği veya irritasyonun devam etmesi durumunda %8–20 oranında nüks bildirilmiştir (29).

Lazer destekli eksizyon, konvansiyonel cerrahiye kıyasla daha az intraoperatif kanama, hızlı iyileşme ve minimal skar oluşumu gibi avantajlar sunmaktadır

(30). Narayanan ve ark. (4) lazer destekli cerrahi eksizyonun etkinliğini vurgulamış, Palwankar ve ark. (10)

ise nüks riskini azaltmak için eksizyon sonrası çevre dokunun detertraj ve küretajının önemini belirtmiştir.

Bizim olgumuzda da literatürde Tsikopoulos ve ark. (12), Srivastava ve ark. (2), Jain ve ark. (31) ile

Lalchandani ve ark. (29) tarafından bildirilen olgulara benzer şekilde lezyon tamamen eksize edilmiş, taban koterize edilmiş ve nüks saptanmamıştır.

4. Sonuç

Sert damakta görülen travmatik fibromlar nadir olup genellikle benign seyirlidir. Kesin tanı histopatolojik inceleme ile doğrulanmalıdır. Uygun cerrahi eksizyon ve irritan faktörlerin (ör. sigara kullanımı, travmatik oklüzyon, kötü ağız hijyeni) eliminasyonu ile прогноз genellikle mükemmeldir. Düzenli postoperatif takip ise olası nükslerin erken saptanması açısından önem taşımaktadır.

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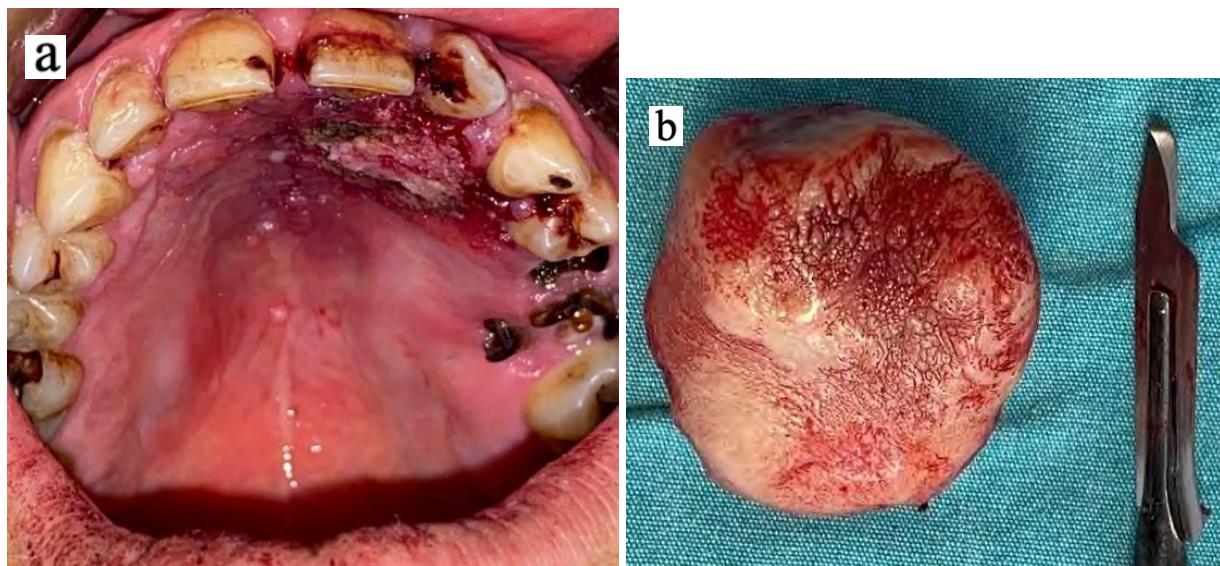
6. Resimler



Resim 1: Sert damağın merkezinde 41x35x25 mm boyutlarında, pediküllü, ekzofitik lezyonu gösteren ameliyat öncesi ağız içi görüntü.



Resim 2: Hastanın ameliyat öncesi çekilen panaromik film görüntüsü.



Resim 3: a) Kitle eksize edilip bölge koterize edildikten sonra postoperatif ağız içi görüntü b) Eksize edilmiş kitle.



Resim 4: Ameliyattan 1 hafta sonra kontrol randevusundaki ağız içi görüntü.



Resim 5: Ameliyattan 2 ay sonra kontrol randevusundaki ağız içi görüntü.



Resim 6: Ameliyattan 3 ay sonra kontrol randevusundaki ağız içi görüntü.

7. Tablolar

Tablo 1. Oral kavitede palatal bölgede bildirilen dev fibrom vakaları

No	Yazar c	Yayın Yılı	Yaş / Cinsiyet	Eksizyo na Kadar Geçen Süre (yıl)		Lokalizasyon	Boyut
1	Ueda ve ark.(1)	1968	49 / Kadın	22		Sert damağın orta hattı	Ceviz büyüklüğünde
2	Niiikuni ve ark.(1)	1968	48 / Erkek	6		Sert damağın orta hattı	50 × 40 × 20 mm
3	Kitagawa ve ark.(1)	1980	69 / Kadın	20		Sol damak	90 × 65 × 50 mm, 86 g
4	Sanka ve ark.(1)	1987	34 / Erkek	6-7		Sert damağın orta hattı	57 × 36 × 20 mm, 25 g
5	Yoshiba ve ark.(1)	2014	60 / Erkek	30		Sert damak	30 × 27 × 12 mm, 31 g
6	Kar ve ark.(8)	2015	65 / Kadın	2		Sert damak	35 x 20 x 12,5 mm
7	Jain ve ark.(31)	2016	80 / Erkek	20		Sert damağın orta hattı	40 x 50 mm
8	Tsikopoulos ve ark.(12)	2021	90 / Kadın	10		Sert damak	22 mm
9	Srivastava ve ark.(2)	2024	60 / Kadın	2		Sert damak sağ tarafı	35 × 30 mm
10	Narayanan ve ark.(4)	2024	51 / Erkek	3 ay		Sert damağın orta hattı	20 × 25 × 10 mm



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İlacı Bağlı Çene Osteonekrozu (MRONJ): Olgular Üzerinden Literatürle Desteklenmiş Bir DeğerlendirmeAtakan Şahin, ZEYNEP AFRA AKBIYIK AZ, Gülsüm Ak

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GİRİŞ: İlacı bağlı çene osteonekrozu (MRONJ), özellikle bifosfanat veya denosumab gibi antirezorptif ajanlar kullanan hastalarda ortaya çıkabilen, tedavi süreci güç bir komplikasyondur. Hastalığın oluşumunda sistemik durum, tedavi süresi, ilaç tipi, lokal faktörler ve dental cerrahi girişimler önemli rol oynamaktadır. Bu çalışmada, farklı klinik geçmişe sahip MRONJ olguları literatür bilgileriyle birlikte değerlendirilmiştir.

VAKA SUNUMU: Çeşitli onkolojik ve metabolik hastalıklar nedeniyle intravenöz antirezorptif tedavi almış bireylerde, dental cerrahi sonrasında çene osteonekrozu geliştiği gözlenmiştir. Hastaların tamamında tanı klinik ve radyografik bulgularla doğrulanmış, tedavi sürecinde pentoksifilin ve tokoferol içeren "PENTO" protokolü ile birlikte antibiyotik tedavisi, klorheksidinli irrigasyon ve lokal debridman uygulanarak takip edilmiştir. Klinik takiplerde lezyon alanlarında iyileşme eğilimi ve semptomlarda gerileme izlenmiştir. Olguların izleminde konservatif yaklaşımların, enfeksiyon kontrolü ve sistemik desteğin hastalık seyrinin yönetiminde önemli bir rol üstlenebileceği değerlendirilmiştir.

SONUÇ: Antirezorptif ilaç kullanan hastalarda dental cerrahi işlemler sonrası MRONJ gelişme riski dikkate alınmalıdır. Cerrahi planlama öncesinde sistemik durumun ayrıntılı olarak değerlendirilmesi, profilaktik önlemlerin alınması ve multidisipliner bir yaklaşımın benimsenmesi önemlidir. Bu olgular, erken tanı ve dikkatli hasta yönetiminin komplikasyonlarının önlenmesinde etkili olabileceğini göstermektedir.

Anahtar Kelimeler: Bifosfanat, MRONJ, Osteonekroz

Medication-Related Osteonecrosis of the Jaw (MRONJ): A Literature-Supported Evaluation Through Case ObservationsAtakan Şahin, ZEYNEP AFRA AKBIYIK AZ, Gülsüm Ak

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OBJECTIVE: Medication-related osteonecrosis of the jaw (MRONJ) is a challenging complication that may occur in patients receiving antiresorptive agents such as bisphosphonates or denosumab. The development of the disease is influenced by systemic conditions, duration of therapy, drug type, local factors, and dental surgical interventions. This study evaluates MRONJ cases with different clinical backgrounds in the context of relevant literature.

CASE PRESENTATION: In individuals who had received intravenous antiresorptive therapy for various oncologic and metabolic conditions, osteonecrosis of the jaw was observed following dental surgery. In all patients, the diagnosis was confirmed by clinical and radiographic findings. During the treatment process, patients were managed with the "PENTO" protocol, including pentoxifylline and tocopherol, alongside antibiotic therapy, chlorhexidine irrigation, and local debridement. Follow-up examinations revealed a tendency toward lesion improvement and reduction in symptoms. Conservative management focusing on infection control and systemic support was considered to play an important role in the overall course of the condition.

RESULT: Patients using antiresorptive medications should be carefully evaluated before dental surgical procedures due to the risk of MRONJ development. Comprehensive systemic assessment, implementation of preventive strategies, and a multidisciplinary approach are essential. These cases highlight that early diagnosis and attentive patient management may contribute to preventing complications and achieving favorable outcomes.

Keywords: Bisphosphonate, MRONJ, Osteonecrosis

Introduction

Medication-Related Osteonecrosis of the Jaw (MRONJ) is a clinical condition characterized by the presence of exposed bone, or bone that can be probed through an intraoral or extraoral fistula in the maxillofacial region, persisting for more than eight weeks. This condition occurs in patients who have been treated with antiresorptive and/or antiangiogenic agents and have no history of radiotherapy to the head and neck region. MRONJ is most commonly associated with the use of bisphosphonates and denosumab.

Initially, osteonecrosis of the jaw was thought to be exclusively related to bisphosphonate therapy. However, as evidence accumulated demonstrating that denosumab and various antiangiogenic agents could induce a similar clinical presentation, the American Association of Oral and Maxillofacial Surgeons (AAOMS) updated the terminology from "BRONJ" to "MRONJ" in 2014.

According to the updated AAOMS position paper published in 2022, the diagnostic criteria for MRONJ include the following:

- Current or previous treatment with antiresorptive therapy alone or in combination with immune modulators and/or antiangiogenic agents,
- Exposed bone or bone that can be probed through a fistula in the maxillofacial region persisting for more than eight weeks,
- No history of radiation therapy to the jaws or obvious metastatic disease to the jaws.

Based on clinical and radiographic findings, MRONJ is classified into four stages:

- Stage 0: No exposed bone; however, non-odontogenic pain, neurosensory alterations, and radiographic findings such as sclerosis may be present.
- Stage 1: Exposed or probeable bone without symptoms or signs of infection.
- Stage 2: Exposed bone associated with pain, inflammation, and clinical evidence of infection.
- Stage 3: In addition to Stage 2 findings, the presence of pathological fracture, extraoral fistula, oroantral or oronasal communication, or extensive osteolysis.

The management of MRONJ includes both non-surgical and surgical approaches. Non-surgical treatment focuses on patient education and the control of pain and infection, whereas surgical treatment involves resection techniques

tailored to the localization and extent of the defect. The primary goal of both approaches is to improve the patient's quality of life.

The PENTO protocol, consisting of a combination of pentoxifylline and tocopherol, has been proposed as an alternative treatment option, particularly for patients who are not suitable candidates for surgical intervention. Due to its angiogenic and anti-inflammatory properties, this protocol has been reported to yield favorable outcomes in the management of MRONJ.

Case Reports

Case 1

A 69-year-old female patient with a medical history of hypertension and osteoporosis had received intravenous bisphosphonate therapy. Following the extraction of tooth #47, necrosis developed in the corresponding region, and the patient was diagnosed with Stage 2 MRONJ. Sequestration was achieved through antibiotic therapy, followed by surgical removal of the necrotic bone. An uneventful healing process was observed in the postoperative period.

Case 2

A 74-year-old male patient with a history of prostate cancer had undergone chemotherapy and radiotherapy in 2020 and received intravenous bisphosphonate therapy due to bone metastases. The patient presented with pain and purulent discharge following a tooth extraction in the left mandibular region. Clinical examination revealed exposed bone, and Stage 2 MRONJ was diagnosed. After sequestrum formation became evident on computed tomography, a sequestrectomy was performed. The patient is currently under regular follow-up.

Case 3

A 58-year-old male patient had a history of surgical treatment for bladder cancer in 2021 and intravenous bisphosphonate use for osteoporosis. Following a tooth extraction in the right mandibular region, necrosis developed, and the patient was diagnosed with Stage 2 MRONJ. Surgical debridement was performed in conjunction with antibiotic therapy. At the five-month follow-up, the lesion was found to have regressed to Stage 1 disease.

Discussion

The etiology of MRONJ is multifactorial and has not yet been fully elucidated. While the role of antiresorptive agents in the development of MRONJ is strongly supported by the literature, evidence regarding antiangiogenic agents, corticosteroids, and immunomodulatory drugs remains limited. Although there are reports suggesting that the use of drug combinations and higher cumulative doses may increase the risk of MRONJ, most of these findings are based on case reports and small patient series.

Conservative treatment approaches are generally preferred; however, the localization and size of the lesion are the main determinants of treatment complexity. Although no standardized treatment protocol exists for the PENTO regimen, clinical observations suggest that, in the absence of contraindications, it may positively influence lesion prognosis in selected cases.

Conclusion

Due to the multifactorial nature of MRONJ etiology and the wide range of variables affecting treatment outcomes, establishing a standardized treatment protocol remains challenging. Therefore, a patient-centered treatment approach should be adopted, with careful evaluation of individual risk factors. Given that prevention represents the most effective strategy, it is crucial to increase awareness of MRONJ among dentists, oncologists, and orthopedists, and to ensure appropriate dental evaluation and preparation of patients prior to initiating antiresorptive or antiangiogenic therapies.

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Figures

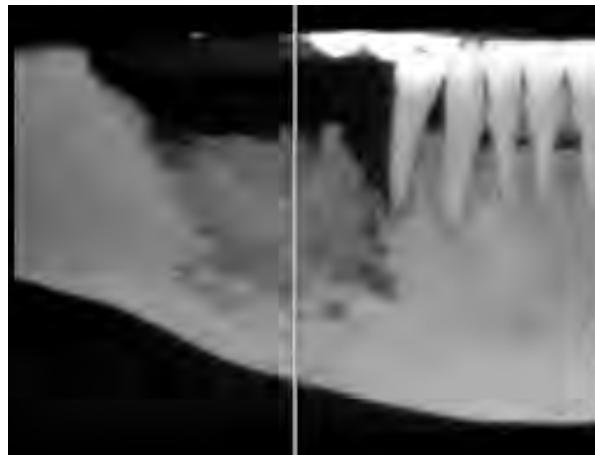


Figure 1: Preoperative panoramic radiograph



Figure 2: Preoperative intraoperative clinical image



Figure 3: Preoperative intraoperative clinical image

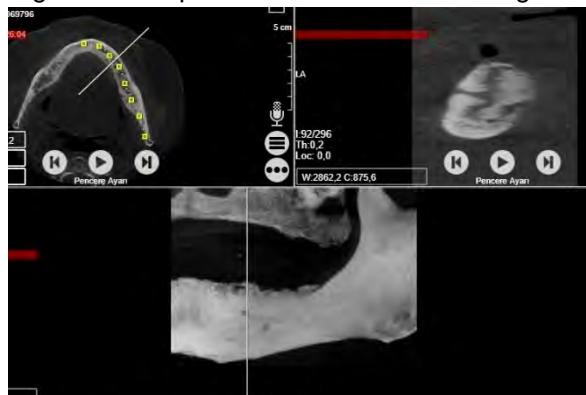


Figure 4: Preoperative computed tomography (CT) image



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Finite Element Analysis of Mandibular Biomechanical Stress under Vertical

Loading in Models with Angular Defects

1. Introduction

The mandible is among the most frequently fractured bones in trauma, and intra-osseous lytic lesions further weaken its structure, predisposing it to pathological fractures[1]. These fractures arise from underlying conditions such as neoplasms, infections, osteoporosis, radiotherapy, and bisphosphonate therapy, which compromise bone integrity[2], [3].

Enucleation is a common surgical approach for removing cystic or tumour lesions[4]. However, it increases the risk of fracture, particularly in the posterior mandible. Mini plates made of titanium or stainless steel are typically used to reduce this risk; however, their biomechanical effectiveness in enucleation defects has not been sufficiently quantified, and there are no standard protocols or established guidelines.

In this context, finite element analysis (FEA) emerges as a valuable tool for investigating the effects of biomechanical forces on bone tissue in the mandible and for assessing the performance of miniplates in this process. Finite element analysis (FEA) is an engineering technique that can be used to calculate stress and deformation. This method has been proven to be an effective solution to complex biomechanical problems, and its use in dentistry is a frequent occurrence.

Although finite element analysis (FEA) is a valuable tool for modelling stress distribution in dental biomechanics, most studies have focused on traumatic fractures or implant loading. This has resulted in limited insight into stress patterns and reinforcement strategies related to defects. This study uses FEA to characterise stress distribution in mandibular defects caused by enucleation, and to evaluate the biomechanical reinforcement provided by miniplates. Specifically, the study aims to assess stress distribution, quantify the mechanical contribution of miniplates and determine the residual strength of surgically weakened areas under functional loading. The study was conducted to evaluate stress distribution, measure the mechanical contribution of miniplates and determine the residual strength of surgically weakened areas under functional loading. The aim was to assist in creating evidence-based models to guide clinical strategies for preventing pathological fractures.



2. Materials and Methods

This study was conducted in collaboration between the Department of Oral and Maxillofacial Surgery at Ege University Faculty of Dentistry and Tinus Technologies. The research focused on designing three-dimensional (3D) mesh structures and transforming them into mathematically optimized solid meshes. These models were analyzed using finite element analysis (FEA) to evaluate stress distribution. Computational analyses were performed on HP workstations equipped with 2.40 GHz INTEL Xeon E-2286 processors and 64 GB ECC memory.

2.1. Bone Model Development

The bone model utilised in this study was obtained from the Visible Human Project (The National Library of Medicine, Maryland, USA)[5]. The tomographic data, with a slice thickness of 0.33 mm, were reconstructed and transferred to 3DSlicer software in DICOM (.dcm) format. The reverse engineering and 3D CAD processing were performed in ANSYS Spaceclaim, and the solid models were integrated into the analysis environment with optimised mesh structures generated in ANSYS Workbench. Finite element analyses were then conducted using LS-DYNA. The geometry of the cortical bone was reconstructed with 2 mm buccal and 1 mm lingual offsets, as previously described by Swasty et al.[6]

In this study, a mesh convergence test was performed to ensure the reliability and accuracy of the finite element model. The objective of this study was to ascertain a mesh density with a maximum error of 3% whilst maintaining computational efficiency. Successive meshes of varying element sizes, from coarse to fine, were analysed under identical loading and boundary conditions, and the relative error between two consecutive meshes was calculated as follows: The relative error percentage is calculated as follows: $(\text{Value_updated} - \text{Value_previous}) / \text{Value_updated} \times 100$. This process was continued until the error threshold of 2-3% was achieved. The utilisation 2D triangular meshes and 3D tetrahedral meshes was deemed appropriate in view of the fact that such meshes are well-suited to capturing complex bone geometries. The quality of the mesh was then assessed for skewness ($>80^\circ$) and minimum element length (0.001), with any failed meshes being corrected accordingly.

2.2. Mini-Plate and Screw Modeling

A 1-mm-thick, six-hole mini-plate was initially modeled in accordance with Champy's method and deformed at the ramus regions using ANSYS SpaceClaim[7] with six screws of 2 mm diameter and 5 mm length incorporated for fixation[8].

The straight titanium mini-plate was imported as a CAD model into ANSYS SpaceClaim and virtually contoured to the anatomical curvature of the mandibular ramus using defined reference planes and the "Move" and "Bend" tools to achieve a 25–30° bending angle based on CBCT-derived measurements. In addition, the integrity of the mesh was ensured, as were the preservation of cross-sectional thickness and the maintenance of co-axial screw holes to simulate a realistic screw–bone interface for finite element analysis.



2.3. Simulation Scenarios

In this study, four defect configurations were modelled to represent the most clinically relevant patterns of cortical loss in the mandibular third-molar/angle region: buccal perforation, lingual perforation, bicortical perforation, and intraosseous lesion. Buccal cortical loss is frequently observed following surgical access along the external oblique ridge, and has been associated with late angle fractures[9]. Lingual perforation, frequently induced by expansile odontogenic lesions, modifies stress distribution by compromising the integrity of the buccal plate while penetrating the lingual cortex[10]. Bicortical perforation is a severe scenario, typically associated with large cystic lesions that expand and thin both cortices, markedly reducing bone strength[11]. Finally, intraosseous lesions without overt perforation were included to model early or treated cavities where residual cortical thickness remains critical for stability. These scenarios are consistent with the clinical epidemiology of pathological or iatrogenic fractures in the mandibular angle and with established biomechanical principles for fixation along the Champy lines[12]. To simulate these conditions, defects were introduced into the mandibular bone models in the region of tooth 38, including buccal, lingual, or combined perforations, while maintaining a consistent cortical bone thickness of 2 mm across all models. The different bone models were then finalized by applying Champy-style bent mini-plates, thereby enabling a standardized evaluation of fixation performance[13].

Geometric models were meshed and prepared for analysis using ANSYS Workbench, and simulations were performed with LS-DYNA software. Linear material properties, including elastic modulus and Poisson's ratio, were applied for realistic mechanical behavior.

2.4. Loading and Boundary Conditions

In the present study, only vertical masticatory forces were simulated in order to standardize the loading conditions and ensure comparability among the models. This choice was based on literature indicating that vertical loading constitutes the predominant component of masticatory forces during intercuspal position[14]. Two force scenarios were applied to the models: A vertical force of 350 N was applied perpendicular to the fossa of the first molar (tooth 36) in the defect region. A vertical force of 350 N was applied to the fossa of the healthy first molar (tooth 46). The implementation of boundary conditions entailed constraining all degrees of freedom at the mandibular condylar process nodes, thereby preventing movement along any axis. This methodological approach ensured the stability of the models and enhanced the accuracy of the analysis results. A total of 16 linear static analyses were performed across eight models under these loading and boundary conditions. The 350 N force was selected to represent the average bite force of an adult male[15].

To ensure the accuracy of the analyses, surface interactions between components in the mathematical models were properly defined in the analysis software. A bonded contact model was applied to all interacting components, assuming full correlation of their movements during motion. This approach allowed for realistic simulation of interactions between the parts[16].



3. Results

Under loading from the defective side, the principal stress analysis revealed maximum and minimum values of 142.966 MPa and 115 MPa in Model 1, and 150.117 MPa and 17 MPa in Model 2. When the force was applied from the healthy side, the maximum and minimum principal stress values were measured as 138.381 MPa and 99.351 MPa in Model 1, and as 135.248 MPa and 39.992 MPa in Model 2, in that order.

In Model 3, maximum and minimum principle stresses were measured as 565.461 MPa and 472.137 MPa, respectively. In model 3, the maximum principle stress of 565.461 MPa is reduced to 204.173 MPa and the minimum principle stress of 472.137 MPa is reduced to 105.517 MPa at a chewing force of 350 N applied from the healthy side.

In Model 4, the maximum and minimum principal stress values were measured as 140.810 MPa and 40.010 MPa, respectively. In model 4, the maximum principle stress of 140.810 MPa is reduced to 110.619 MPa and the minimum principle stress of 40.010 MPa is reduced to 80.806 MPa at a chewing force of 350 N applied from the healthy side.

The application of a titanium plate reduced maximum principle stress in Model 1 (Model 5) from 142 MPa to 37 MPa, and in Model 2 (Model 6) from 150 MPa to 66 MPa.

In Model 3, the application of a titanium plate (Model 7) reduced maximum principle stress by 86%, from 565 MPa to 74 MPa, and minimum principle stress by 75%, from 472 MPa to 117 MPa. In Model 4, the application of a titanium plate (Model 8) reduced maximum principle stress by 52%, from 140 MPa to 66 MPa.

4. Discussion

The management of cystic and tumour lesions is an important topic in oral and maxillofacial surgery, given their tendency to cause pathological fractures of the jawbone. Studies have shown that most pathological fractures of the mandible are associated with radiolucent lesions, particularly in the third molar region. Surgical interventions in this area can result in significant bone loss, thereby increasing the risk of fracture[17], [18]. There have been reports in the literature of cases where radicular cysts have caused mandibular fractures (Xiao et al.)[19]. Similarly, cases of odontogenic myxoma demonstrate the importance of preserving adequate residual bone height and show that fixation with miniplates alone may be inadequate and that more robust reconstruction methods may be required[2]. These reports emphasise the biomechanical weakness of the mandible in the presence of cystic and tumour defects, which supports the rationale for our study.

Murakami et al. analyse mandibular resistance biomechanically after marginal resection, using both finite element models and a human cadaver mandible. The study evaluated the impact of residual bone height, occlusion and masticatory forces on fracture formation. It was found that fracture sites corresponded to areas of stress concentration in the finite element analysis (FEA). Further research is needed to define a clinically safe residual bone height, the authors emphasised, given the variability between patients in terms of resection area, force magnitude, cortical thickness, bone density and mandibular size[20].

Moreover, in their FEA studies, Yilmaz A. investigated the risk of pathological fractures following marginal resection of the mandibular corpus. The study demonstrated that when the residual bone height was 6 mm, both unicortical and bicortical defects were prone to pathological fractures under all loading conditions. It was concluded that minimizing occlusal force transmission to the defect area is critical to reducing the risk of fracture. Additionally, the author emphasized that the use of plate-screw fixation systems is recommended, as the mechanical strength of the mandible is significantly compromised post-resection[21].



In the fixation of mandibular angulus and corpus lesions in close proximity to the angulus, fixation to the superior and inferior borders of the defect does not result in a significant reduction in stress on the cortical bone. The method described by Champy, mini plate fixation with a twisted, upper part extending to the anterior edge of the ramus, is the method that minimizes the stress on the cortical bone[22]. In the models examined in this study, mini-plate application was performed in accordance with the methodology outlined by Champy.

Recent finite element analysis (FEA) studies have explored alternative fixation methods that could improve mandibular stability. For example, Pandya et al. showed that a modified 3D strut miniplate system offered better force distribution and displacement control than conventional plates[23]. Similarly, Tazh et al. found that locking miniplate-screw systems reduced stress concentration and achieved more favourable strain distribution. Taken together, these findings suggest that 3D and locking plate systems offer distinct biomechanical advantages, particularly in complex or extensive defects[24]. By contrast, the miniplate applications evaluated in the present study were found to provide adequate stability, particularly for medium- sized defects. However, for larger defects, reconstruction plates or three-dimensional plate systems appear to offer superior biomechanical resistance. In this context, our findings contribute to the growing body of evidence that can help clinicians select the most appropriate fixation method according to the size and anatomical location of the defect.

This study evaluated a series of realistic loading scenarios using 16 analyses on eight models supported by literature. Our modelling approach is consistent with recent, valid FEA methodologies. For instance, Daqiq et al. developed a mechanically validated mandibular finite element analysis (FEA) model using polymeric mandible tests, demonstrating the model's reliability in assessing fixation stability[25]. The results obtained are expected to play a role in guiding clinicians' decisions and providing patients with effective post-operative recommendations.

Operations in oral surgery are generally performed using a buccal approach, and in models where the buccal cortical layer is preserved, the defect in the buccal region is positioned more apically compared to the lingual side. This study has shown that the presence of cortical bone in the buccal region of the defect provides higher resistance to chewing forces compared to having cortical bone only in the lingual region. The compression stress was measured at 115 MPa in the model without cortical bone in the buccal region (Model 1), whereas in the model with buccal cortical bone, the compression stress was measured at 17 MPa (Model 2).

In buccal perforated models, the application of a titanium plate reduced tensile stress from 142 MPa to 37 MPa, corresponding to a 73% reduction. Similarly, in lingual perforated models, tensile stress decreased from 150 MPa to 66 MPa following titanium plate application, resulting in a 55% reduction. However, in models where a cortical bone layer is present on the buccal side of the defect, the relative effectiveness of the titanium plate is lower in terms of percentage reduction.

In models featuring bicortical perforation, the use of a titanium plate has been shown to significantly reduce both tensile and compressive stress values. Specifically, tensile stress is reduced by 86%, from 565 MPa to 74 MPa, while compressive stress decreases by 75%, from 472 MPa to 117 MPa. In non-perforated models, the application of a titanium plate results in a 52% reduction in tensile stress, lowering it from 140 MPa to 66 MPa. In all analyses, the application of masticatory force from the healthy side resulted in lower stress levels on the cortical bone compared to force applied from the defect side. Additionally, the use of titanium plate- screw fixation was found to further reduce cortical bone stress, highlighting its biomechanical effectiveness in stabilizing the defect area.



An analysis of von Mises stress values in screws within plate-screw fixation models revealed that the highest stress concentrations occurred in the screws closest to the defect site. For example, in Model 5, von Mises stress values of 587 MPa and 420 MPa were recorded in the first screws adjacent to the defect, whereas the second screws exhibited lower stress values of 147 MPa and 130 MPa. These findings highlight the critical importance of optimal positioning of the initial screws near the defect during surgical fixation to ensure mechanical stability and load distribution.

In models featuring bicortical defects, the stress accumulated within the cortical bone at the defect site significantly exceeded the ultimate strength values reported by Frost (120 MPa) and Steinhauser (186.5 MPa)[26]. This finding underscores the necessity of employing plate-screw fixation to prevent pathological fractures and maintain structural integrity.

Based on our findings, we recommend using plate-screw fixation for mandibular defects, particularly when there is bicortical perforation. This method significantly reduces tensile and compressive stresses, thereby lowering the risk of pathological fractures. It has also been observed that placing the screw in the position closest to the edge of the defect improves mechanical stability. The screw closest to the defect should be rigidly placed. Although the benefits of miniplates are more limited in buccal cortical defects, stress reduction is still clinically significant and is therefore recommended to increase resistance.

Conclusion

This study, conducted using finite element analysis, clearly demonstrated the theoretical effectiveness of miniplate application in reducing stress in the defect area following surgical removal of the lesion. Factors such as the size and location of the defect, the quality and thickness of the remaining cortical bone, patient-specific anatomical variations, and the direction and magnitude of masticatory forces may all influence the suitability and effectiveness of miniplate fixation. Therefore, clinical decision-making should be individualized and supported by comprehensive biomechanical evaluation.

In applications involving mini-plates, it is imperative that the initial screws, particularly those adjacent to the defect, are positioned accurately during the surgical procedure, as these screws bear the greatest stress. In the posterior region of the mandible, the buccal cortical bone demonstrates superior strength in comparison to the lingual cortical bone. Consequently, prophylactic mini-plate application should be considered if the defect in the buccal cortical bone is high and the patient's masticatory strength is high. Regardless of defect type, applying vertical force from the healthy side has been shown to reduce cortical bone stress.

The results may assist surgeons in optimizing fixation strategies, particularly in cases involving extensive cortical bone loss. Future studies should aim to incorporate patient-specific data, including variable bone densities and geometries, and simulate multi-directional masticatory forces to enhance the realism of finite element models. Additionally, validation of simulation outcomes with in vitro or in vivo studies would strengthen the clinical applicability of the results.

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Mandibular Asimetriye Sahip Post-Pubertal Sınıf III Hastaların Ortognatik Cerrahi Tedavisi: 5 Olgu Sunumu

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Özet

Amaç: İskeletsel Sınıf III maloklüzyon, estetik kaygılar, fonksiyonel bozukluklar ve psikososyal etkilerle ilişkili sık görülen bir dentofasiyal deformitedir. Postpubertal bireylerde, özellikle mandibular asimetri varlığında, optimal düzeltme genellikle ortodontik–ortognatik cerrahi kombinasyonu ile sağlanmaktadır. Bu olgu serisi, beş hastanın tanı, tedavi ve takip süreçlerini sunmakta ve güncel literatürle karşılaştırmaktadır.

Vaka Raporları : 2019–2023 yılları arasında Uşak Üniversitesi Diş Hekimliği Fakültesi Ortodonti Anabilim Dalı'na başvuran dört kadın ve bir erkek iskeletsel Sınıf III hasta değerlendirilmiştir.

Vaka 1: 36 yaşındaki kadın hasta mandibular prognatizm ve fasiyal asimetri nedeniyle Kasım 2022'de ortognatik cerrahi uygulanmış, 30 aylık takipte stabil sonuçlar elde edilmiştir.

Vaka 2: Mandibular prognatizm ve asimetri şikayeti olan 20 yaşındaki kadın hasta Şubat 2023'te ortognatik cerrahi uygulanmış, 18 aylık takipte stabilite ve estetik iyileşme sağlanmıştır.

Vaka 3: 18 yaşındaki kadın hasta, hassasiyet ve mandibular asimetri ile başvurmuştur. Şubat 2024'te ortognatik cerrahi uygulanmış, 12 aylık takipte fonksiyonel ve estetik düzeltme gözlenmiştir.

Vaka 4: 18 yaşındaki erkek hasta mandibular prognatizm ve alt dudak protrüzyonu nedeniyle Mayıs 2024'te opere edilmiş, 10 aylık takipte stabil sonuç elde edilmiştir.

Vaka 5: 19 yaşındaki kadın hasta, çene asimetrisi ile Mayıs 2025'te cerrahi tedavi uygulanmış, 3 aylık erken dönem takibi yapılmıştır.

Ortognatik cerrahi planlaması için KLS Martin IPS Case Designer kullanılmıştır. Tüm hastalarda standart radyolojik kontroller 3–6 ay ve sonrasında 6 ay aralıklarla uygulanmıştır.

Sonuç: Takip süreleri 3–30 ay arasında değişmiş, tüm hastalarda okluzal ve iskeletsel stabilitet korunmuştur. Bulgular, iskeletsel Sınıf III maloklüzyonun uzun dönemli tedavisinde multidisipliner ortodontik–cerrahi yaklaşımın etkinliğini desteklemektedir.

Anahtar Kelimeler: İskeletsel Sınıf III maloklüzyon, Ortognatik Cerrahi, Fasiyal Asimetri,

1. GİRİŞ

Dental anomaliler çevresel faktörler, genetik faktörler ve bu ikisinin kombinasyonlarıyla oluşabilmektedir. Unutulmamalıdır ki farklı toplumlarda iskeletsel anomalî görülmeye sıklığı birbirine göre değişebilmektedir. İngiltere'de yapılan bir çalışmaya göre ortodonti kliniğine başvuran iskeletsel anomalîye sahip olan hastaların cerrahi gereksinimi %5-19 arası değişirken (1), ABD'de bu oran bir çalışmada %2 oranında bulunmuştur (2). Ülkemizde ise 2008-2012 yılları arasında yapılan ve 2329 adolesanın tarandığı bir çalışmada (3), %40'ında Sınıf 2 maloklüzyon, %10.3'ünde Sınıf 3 maloklüzyon saptanmıştır, popülasyonun üçte birinin ortodontik tedavi görmesinin gerekli olduğu bildirilmiştir. Ancak bu vakaların kaçının cerrahi gereksinimde olduğu tespit edilmemiştir. Yine ülkemizde 2022 yılında yapılan çalışmada (4) iskeletsel maloklüzyon görülmeye sıklığı Sınıf II bireyler için %35.7, Sınıf III bireyler için % 17.7'dir. Yapılan araştırmada aynı zamanda asimetri de değerlendirilmiş ve görülmeye sıklığı 1/5 (%20) olarak raporlanmıştır. Bunun ışığında sınıf III anomali görülmeye sıklığının zaman içerisinde artmış olarak görmekteyiz. Bu konuda yetersiz literatürde daha fazla çalışmaya ihtiyaç vardır.

2. VAKA RAPORLARI

Bu vaka raporunda Uşak Üniversitesi Diş Hekimliği Fakültesi Ortodonti Anabilim Dalında tedavi görmüş iskeletsel Sınıf III anomalîye ve asimetriye sahip ve planlaması 3 boyutlu cerrahi planlama programı ile yapılan (IPS Case Designer, KLS Martin Group, Tuttlingen, Germany) 5 hastanın başarılı cerrahi-ortodontik tedavisi anlatılacaktır.

- 2.1. VAKA 1: Mandibular prognatizm ve fasiyal asimetri nedeniyle kliniğimize başvuran 36 yaşındaki kadın hastada iskeletsel Sınıf III anomalî tespit edilmiştir. Görsel estetikte bozulma ve solunum güçlüğü şikayetleri üzerine ortognatik cerrahi planlanmıştır. 2022 yılında opere edilen hastaya planlanan cerrahi hareketler tabloda belirtilmiştir (Tablo 1). Bir yıllık ve üç yıllık postoperatif takibi bulunan hastanın sefalometrik analizinden elde edilen sonuçlarda elde edilen iskeletsel değişimin korunduğu gözlemlenmiştir (Tablo 6).
- 2.2. VAKA 2: 20 yaşındaki iskeletsel Sınıf III maloklüzyona sahip kadın hastanın temel şikayetî alt çenesinin onde olmasıydı. Ciddi bir iskeletsel mandibular prognatîsi olan hastaya ortognatik cerrahi önerilmiştir. 2023 yılında opere edilen hastaya planlanan cerrahi hareketler tabloda açıklanmıştır (Tablo 2). Post operatif 1 yıllık ve 2 yıllık takibi bulunan hastanın elde edilen sonuçlarının kabul edilebilir olduğu görülmüştür (Tablo 7).
- 2.3. VAKA 3: Estetik memnuniyetsizlik, oklüzyon bozukluğu ve diş hassasiyeti şikayetleriyle kliniğimize başvuran Amelogenezis Imperfektalı hastada Sınıf III maloklüzyon, mandibular

asimetri ve anterior openbite gözlenmiştir. Hastanın ihtiyaçlarına uygun olarak planlanan hareketler tabloda gösterilmiştir (Tablo 3). İki yıllık postoperatif takipte iskeletsel stabilite sağlandığı görülmüştür (Tablo 8). Operasyon sonrası 6. Ayda protetik tedavisi için yönlendirilen hastanın gerekli işlemleri yapılmış ve takibi için ortodonti kliniğine tekrar yönlendirilmiştir.

- 2.4. VAKA 4: Temporomandibular eklemden ses gelmesi şikayetiyle başvuran erkek hastada redüksiyonlu disk deplasmanı ve Sınıf III iskeletsel anomalisi tespit edilmiştir. Sekiz ay süren anterior rehberlikli splint tedavisi sonrası cerrahi-ortodontik tedavi endikasyonu konmuştur. 2024 yılında yapılan cerrahi için planlanan hareketler tabloda belirtilmiştir (Tablo 4). Çene ucundaki silikleşme nedeniyle genioplasti de uygulanmıştır. On sekiz aylık takipte stabil sonuçlar elde edilmiştir (Tablo 9).
- 2.5. VAKA 5: Alt çenesinin önde olması şikayetiyle kliniğimize başvuran 17 yaşındaki kadın hastada iskeletsel Sınıf III maloklüzyon saptanmıştır. Fasiyal harmoniyi sağlamak amacıyla 2025 yılında ortognatik cerrahi uygulanan hastaya yönelik planlanan hareketler tabloda belirtilmiştir (Tablo 5). Altı aylık postoperatif takipte stabilite korunmuştur (Tablo 10).

Fikir vermesi için VAKA 3'ün öncesi ve sonrası fotoğrafları paylaşılmıştır (Resim 1).

3. TARTIŞMA

İskeletsel Sınıf III kapanışa sahip hastaların tedavisi bulunduğu yaş grubuna göre şekillenmektedir. Post-pubertal dönemde ortodonti kliniğine tedavi için başvuran hastalarda kamuflaj tedavisi ve cerrahi tedavi seçenekleri mümkündür, ancak kamuflaj tedavisi her bireye uygun değildir. Bunun nedeni bu hastalarda sıkılıkla kompanzasyon görülmesidir. Dişlerin iskelet üzerinde belli bir alveol kemik üzerine yerleşmesi gerekmektedir. Fazla retroklinasyon gösteren mandibular dişler ve proklinasyon gösteren maksiller dişler ortodontik tedavi esnasında belli kaidelere göre kemiğin içerisine alınmalıdır. Buna göre U1-SN açısının 120 dereceden büyük olmaması ve IMPA'nın 80'den küçük olmaması istenir. Post pubertal dönemde kliniğe başvuran hastaların sefalometrik röntgenleri bu nedenle dikkatle incelenmelidir. Başvuru esnasında kompanzasyon nedeniyle bu değerlerin aşıldığı bireyler daha fazla kompanse edilemeyeceği için cerrahiye yönlendirilmelidir. Bu tarz hastalar maksiller yetersizlik, mandibular büyümeye fazlalığı veya her ikisinin kombinasyonuna sahip olabilir. Bu nedenle her bireyin ihtiyacına göre cerrahi dekompanzasyon yapılmalıdır. İskeletsel Sınıf III problemi olan hastaların ortognatik cerrahisinde sıkılıkla gerçekleştirilen hareketler maksiller ilerletme, maksiller gömme ve mandibular set-back olmaktadır. Proffit ve arkadaşlarının (5) yaptığı çalışma sonucunda, bu üç hareketten en stabil olanı maksiller

gömmedir. Bunu maksiller ilerletme takip eder ve en stabil olmayan hareketlerin de arasında gösterilen mandibular set-back bu üç hareketin içinde en stabil olmayanıdır. Ancak maksiller ilerletme esnasında kemik temasının kaybolmamasına dikkat edilmelidir. 2019 yılında ise hareketlerin kapsamının da genişletildiği başka bir çalışma Haas Junior ve arkadaşları tarafından yapılmıştır (6). Hareketler fiksasyon tiplerine göre stabilité açısından değerlendirilmiş ve sistematik incelemelerle desteklenmiştir. Buna göre tek çene cerrahilerde yalnızca maksiller ilerletme hareketinin rezorbe olabilen veya titanyum rıjıt internal fiksasyon (RIF) kullanılmasıyla yüksek derecede stabil hareketler elde edildiği belirtilmiştir. Aynı şekilde bilateral sagittal split osteotomisiyle (BSSO) yapılan set-back hareketinin titanyum RIF ile yapılmasıyla yüksek stabilizasyon gösteren hareketler içinde gösterilmiştir. Aynı çalışmada yapılan hiyerarşik resme göre (Resim 2) titanyum RIF ile yapılan maksillanın aşağı doğru hareketi, intraoral vertikal ramus osteotomisiyle yapılan (IVRO), maksillomandibuler fiksasyon yapılan surgery first vakaları ve BSSO ile yapılan mandibular ilerletme (titanyum veya rezorbe olabilen RIF ile) yüksek stabilité gösteren vakalar arasında gösterilmiştir. Aynı çalışmada maksillanın aşağı yönde hareketi ise rezorbe olan RIF ile stabil olmayan hareketlerin içerisinde yer almıştır.

Asimetri düzeltimiyle ilgili çalışmalarla bakıldığına Yoo ve ark. tarafından yürütülen çalışmada, asimetrik ve simetrik Sınıf III olgularda mandibular geriletme sonrasında proksimal segmentlerin transversal stabilitesi ve gruplar arasında anlamlı bir fark saptanmamıştır (7). Hagensli ve arkadaşlarının 2014 yılında yaptığı çalışmada da BSSO ve rıjıt fiksasyon ile mandibular prognatizm ve asimetrinin düzeltilmesi, ameliyattan sonraki ilk altı ay içinde orta düzeyde iskeletsel bir nüks meydana gelse bile oldukça stabil olarak değerlendirilmiştir (8).

4. SONUÇ

Kombine ortodontik-cerrahi tedavide stabiliteyi etkileyen birçok faktör vardır. Bunlar; ayırcı tanı ve uygun hasta, büyümeye ve cerrahi zamanlaması, temporomandibuler eklem ve kondil pozisyonunun stabilitesi, dental stabilité, nöromusküler adaptasyon, cerrahın becerisi, osteotomi tasarımları, hareket miktarı, yumuşak dokuların ve kasların gerilimsiz olması, mandibular rotasyonun tipi, kompanzasyon mekanizmalarının azaltılması için cerrahi öncesi ortodontik hazırlık, intermaksiller fiksasyon süresi ve yöntemi, cerrahi planlaması, fiksasyon türü, cerrahi işlemin tipi ve malokluzyon türü olarak sınıflandırılabilir (9). Yaptığımız değerlendirmeler sunduğumuz 5 vakada planlanan ameliyat hareketlerinin post operatif dönemde uyumlu olduğunu, takibi yapılan hastaların planlanan sonuçlara göre stabil olduğunu göstermiştir.

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6. RESİMLER





Resim 1: Vaka 3'ün preoperatif ve post operatif intraoral ve ekstraoral fotoğrafları



Resim 2: Ortognatik cerrahide gerçekleştirilen hareketlerin stabilitesinin hiyerarşik sıralaması (6)

7. TABLOLAR

Tablo 1: Vaka 1'in planlanan cerrahi hareketleri

ÇENE HAREKETLERİ

Maksilla: 4 mm maksiller ilerletme, 1,4 mm maksiller gömme ve 0,6 mm sağa kütlesel hareket

5 mm solda ve 2,1 mm sağda set-back olacak şekilde set back/ yaw hareketi Mandibula: kombinasyonuyla asimetri düzeltimi sağlanmıştır.

Tablo 2: Vaka 2'nin planlanan cerrahi hareketleri

ÇENE HAREKETLER

7 maksiller ilerletme, maksillanın 1 mm sağa hareketi ve 2 mm maksiller gömme, ANS

Maksilla: sabit olacak şekilde 4 derece pitch ve saat yönünde 0,4 derece yaw

4 mm set back, 37 numara rotasyon merkezi olacak şekilde saat yönünün tersine 2,3

Mandibula: derecelik pitch hareketi ve saat yönü tersine 0,9 derecelik yaw hareketi

Tablo 3: Vaka 3'ün planlanan cerrahi hareketleri

ÇENE HAREKETLER

5 mm maksiller ilerletme, ANS rotasyon merkezi olacak şekilde 3,5 derce posterior

Maksilla: gömme

Mandibula: 1 mm mandibular set back ve 37 numara rotasyon merkezi olacak şekilde 2,7 derece yaw

Tablo 4: Vaka 4'ün planlanan cerrahi hareketleri

ÇENE HAREKETLER

Maksilla: 4 mm maksiller ilerletme, sağ taraf vertikal olarak sabit sol tarafta 2 mm vertikal gömme

Sağda 4 mm ilerletme, solda 1,5 mm set back olacak şekilde asimetri düzeltimiyle birlikte Mandibula: mandibular sagital hareket .5 mm sliding advancement genioplasti

Tablo 5: Vaka 5'in planlanan cerrahi hareketleri

ÇENE HAREKETLER

6 mm maksiller ilerletme, 2 mm maksiller gömme, ANS sabit olacak şekilde 5,1 derce

Maksilla: posterior sarkıtma ve saat yönünün tersine 2 derce roll

4 mm ilerletme, sola doğru 0,5 mm hareket, 1 mm mandibular sarkıtma, 47 numaralı dış rotasyon merkezi olacak şekilde saat yönünün tersine 4,2 dercelik pitch hareketi ve 2,5 derecelik roll hareketi, 47 numara rotasyon merkezi olacak şekilde saat yönünde 2,6

Mandibula: derecelik yaw

Tablo 6: Hastanın T0 (cerrahi öncesi), T1 (cerrahi sonrası), T2 (post op 12. ay), T3 (post op 36. ay)

Parametre	T0	T1	T2	T3
SNA	83,1	88,3	88,4	89,83
SNB	88,7	87,5	78,7	88,1
ANB	-5,6	0,8	2,1	1,2
Witt's	-7,6	-1,2	-6,3	-1,6
Mx İskelletsel (A-Na Perp)(mm)	-1,6	0,9	-0,3	3,4
Mnd İskelletsel (B -Na Perp)(mm)	8	5,1	3,2	8,7
Konveksite	-14,1	-3,9	2,9	-3,6
Orta Yüz Yüksekliği (Co-A)(mm)	80,8	83,4	84,5	75,9
SN/Go-Gn	19,5	17,3	18	15,2
FMA	17,1	18,6	15,1	14,1

Y Aksı Açısı	59,6	59,3	60,3	58,5
P-A Yüz Yüksekliği	75,3	77,8	74,4	77,1
Nazolabial Açı	116,7	98,5	98,3	100,1
SN-U1	110,4	118,8	117,4	110,3
IMPA	92,5	93,1	92,3	93,2

Tablo 7: Hastanın T0 (cerrahi öncesi), T1 (post op 6. ay), T2 (post op 12. ay) sefalometrik analiz değerleri tablosu

Parametre	T0	T1	T2
SNA	80,6	85,4	88,3
SNB	85,9	80,9	84,8
ANB	-5,3	1,4	3,6
Witt's	-13,1	-5,9	-3,6
Mx İskelletsel (A-Na Perp)(mm)	-2,1	3,4	5,5
Mnd İskelletsel (B -Na Perp)(mm)	14,7	8,1	8,2
Konveksisite	-14,5	-1,5	3,3
Orta Yüz Yüksekliği (Co-A)(mm)	80,5	81,9	83,7
SN/Go-Gn	31,2	36,2	35,8
FMA	25,2	31,7	31,3
Y Aksı Açısı	62,3	64,6	63,4
P-A Yüz Yüksekliği	68,1	60,6	60,4
Nazolabial Açı	120,1	111,2	110,3
SN-U1	108,6	105	109,1
IMPA	82	80	81

Tablo 8: Hastanın T0 (cerrahi öncesi), T1 (cerrahi sonrası), T2 (post op 6. ay), T3 (post op 12. ay), T4 (post op 2. yıl) sefalometrik analiz değerleri tablosu

Parametre	T0	T1	T2	T3	T4
SNA	76,3	79	80,8	79,7	78,9
SNB	78,2	76	78,7	76,8	76
ANB	-1,9	2,9	2,1	2,9	2,9
Witt's	-7,7	-3,3	-6,3	-3,2	-2,7
Mx İskelletsel (A-Na Perp)(mm)	-6,1	1,7	-0,3	0,1	0,4
Mnd İskelletsel (B -Na Perp)(mm)	-7,9	-1,6	-3,2	-3,6	-3,1
Konveksisite	-4,6	5	2,9	4	4,1
Orta Yüz Yüksekliği (Co-A)(mm)	76,6	83,4	84,5	84,3	84,1
SN/Go-Gn	33,2	33,1	31,8	32,4	37
FMA	28,3	25,5	26,1	36,5	29
Y Aksı Açısı	71,4	73,5	69,9	71,8	72,8
P-A Yüz Yüksekliği	74,5	67,5	69,8	67,6	66,5
Nazolabial Açı	121	101,4	120,2	118,7	111,8
SN-U1	107,8	102,1	102,7	105,7	104,1
IMPA	85,4	92,1	86,7	88,9	86,2

Tablo 9: Hastanın T0 (cerrahi öncesi), T1(cerrahi sonrası 6/ay), T2 (Cerrahi sonrası 12. Ay) sefalometrik analiz değerleri tablosu

Parametre	T0	T1	T2
SNA	82,4	86,1	86,4
SNB	84,1	84,2	84,6
ANB	-1,7	1,9	1,9
Witt's	-7,5	-2,1	-2,4
Mx İskelsetsel (A-Na Perp)(mm)	-3,1	0,1	0,3
Mnd İskelsetsel (B -Na Perp)(mm)	-2,4	1,8	2,7
Konveksisite	-3,9	-1,6	-2,1
Orta Yüz Yüksekliği (Co-A)(mm)	81,6	88,8	85,1
SN/Go-Gn	24,6	21,6	21,7
FMA	24	22,3	22,1
Y Aksi Açısı	65,2	63,8	63
P-A Yüz Yüksekliği	70,2	72,5	71,6
Nazolabial Açı	121	116,4	115,5
SN-U1	111,2	113	110,1
IMPA	93	92,4	91,9

Tablo 10: Hastanın T0 (cerrahi öncesi), T1(cerrahiden hemen sonrası), T2 (Cerrahi sonrası 6. Ay) sefalometrik analiz değerleri tablosu

Parametre	T0	T1	T2
SNA	77,8	83,3	83,4
SNB	81,1	82,9	82,9
ANB	-3,3	0,5	0,5
Witt's	-7,1	-4,7	-0,7
Mx İskelsetsel (A-Na Perp)(mm)	-5,9	-0,9	0,2
Mnd İskelsetsel (B -Na Perp)(mm)	-4,9	1,8	0,5
Konveksisite	-7,4	-0,6	1
Orta Yüz Yüksekliği (Co-A)(mm)	77,2	69,8	71,3
SN/Go-Gn	35,2	37,4	35,4
FMA	31,8	35,3	32,4
Y Aksi Açısı	66,2	65,1	64,9
P-A Yüz Yüksekliği	62,2	57	58,5
Nazolabial Açı	63,7	88,1	104,4
SN-U1	105,2	107,8	109,8
IMPA	85,8	81	81,2

Class III Post-Pubertal Patients With Mandibular Asymmetry & Orthognathic Surgery: 5 Cases

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Abstract

Objectives: Skeletal Class III malocclusion is a dentofacial deformity associated with esthetic concerns, functional impairment, and psychosocial distress. In post-pubertal patients, particularly those with mandibular asymmetry, correction usually requires combined orthodontic-orthognathic surgical treatment. This case series presents the diagnosis, management, and follow-up of five patients, compared with current literature.

Case Reports : Between 2019 and 2023, five patients (four females, one male) presented to the Department of Orthodontics, Faculty of Dentistry, Uşak University, with skeletal Class III malocclusion. Main complaints included facial asymmetry, mandibular prognathism, malocclusion, and chewing difficulties.

Case 1: A 36-year-old female with mandibular prognathism and asymmetry underwent orthognathic surgery in November 2022; 30-month follow-up showed stable results.

Case 2: A 20-year-old female with severe mandibular prognathism and asymmetry was treated in February 2023 with orthognathic surgery; 18-month follow-up confirmed stability and esthetic improvement.

Case 3: An 18-year-old female with amelogenesis imperfecta, open bite, and asymmetry underwent orthognathic surgery in February 2024; 12-month follow-up demonstrated functional and esthetic improvement.

Case 4: An 18-year-old male with prognathism and lower lip protrusion was treated in May 2024 with orthognathic surgery; 10-month follow-up showed skeletal stability.

Case 5: A 19-year-old female with bimaxillary retrusion and chin deviation underwent orthognathic surgery in May 2025; early 3-month follow-up showed satisfactory correction.

Virtual planning was performed with KLS Martin IPS Case Designer, and radiological evaluations were obtained at 3–6 months and at 6-month intervals thereafter.

Conclusion: Follow-up periods of 3–30 months demonstrated stable occlusal and skeletal outcomes. Results support the effectiveness of interdisciplinary orthodontic-surgical management in long-term treatment of skeletal Class III malocclusion.

Keywords: Skeletal Class III malocclusion, Orthognathic surgery, Facial asymmetry

1. INTRODUCTION

Dental anomalies can develop due to environmental factors, genetic predispositions, or a combination of both. It should be noted that the prevalence of skeletal anomalies varies among different populations. According to a study conducted in England, the proportion of patients with skeletal anomalies requiring orthognathic surgery among those presenting to orthodontic clinics ranges between 5% and 19% (1), whereas a study in the United States reported this rate as approximately 2% (2).

In Turkey, a study conducted between 2008 and 2012 involving 2,329 adolescents reported Class II malocclusion in 40% of subjects and Class III malocclusion in 10.3% (3). It was also stated that nearly one-third of the population required orthodontic treatment, although the proportion of cases requiring surgical intervention was not specified.

Another study conducted in Turkey in 2022 (4) reported the prevalence of skeletal malocclusion as 35.7% for Class II individuals and 17.7% for Class III individuals. The same study also assessed facial asymmetry, reporting a prevalence of 1 in 5 individuals (20%). These findings suggest that the incidence of Class III anomalies has increased over time. However, more systematic reviews are required to obtain clearer and more comprehensive conclusions.

2. CASE REPORTS

This case series presents the successful orthognathic-orthodontic management of five patients diagnosed with skeletal Class III malocclusion and facial asymmetry, all treated at the Department of Orthodontics, Faculty of Dentistry, Uşak University. Surgical planning was performed using a three-dimensional virtual planning software (IPS Case Designer, KLS Martin Group, Tuttlingen, Germany).

2.1. Case 1

A 36-year-old female patient presented with mandibular prognathism and facial asymmetry. Skeletal Class III malocclusion was diagnosed. The main complaints were facial esthetic disharmony and difficulty in breathing. Orthognathic surgery was planned, and the surgical movements are listed in Table 1. The patient underwent surgery in 2022. Cephalometric analyses obtained at one-year and three-year postoperative follow-ups demonstrated maintenance of the achieved skeletal correction (Table 6).

2.2. Case 2

A 20-year-old female patient with skeletal Class III malocclusion presented with the chief complaint of mandibular protrusion. Due to the presence of marked mandibular prognathism, orthognathic surgery was indicated. The surgical movements performed in 2023 are summarized in Table 2. At one- and two-year postoperative follow-ups, cephalometric evaluation revealed acceptable and stable outcomes (Table 7).

2.3. Case 3

A patient diagnosed with amelogenesis imperfecta presented with esthetic dissatisfaction, malocclusion, and dental hypersensitivity. Clinical examination revealed Class III malocclusion, mandibular asymmetry, and anterior open bite. The surgical plan tailored to the patient's needs is shown in Table 3. Two-year postoperative follow-up demonstrated stable skeletal outcomes (Table

8). The patient was referred for prosthetic rehabilitation at six months postoperatively and subsequently returned to the orthodontic clinic for follow-up.

2.4. Case 4

A male patient presented with complaints of joint sounds in the temporomandibular joint. Clinical evaluation revealed Class III skeletal malocclusion and disc displacement with reduction. After eight months of anterior-guided splint therapy, combined orthodontic–surgical treatment was indicated. The surgical movements performed in 2024 are detailed in Table 4. Due to chin contour deficiency, genioplasty was also performed. The 18-month follow-up revealed stable skeletal and functional results (Table 9).

2.5. Case 5

A 17-year-old female patient presented with the complaint of mandibular protrusion. Skeletal Class III malocclusion was diagnosed. To achieve facial harmony, orthognathic surgery was performed in 2025. Planned surgical movements are summarized in Table 5. At the six-month postoperative follow-up, skeletal stability was maintained (Table 10).

The pre- and postoperative photographs of Case 3 are presented for illustrative purposes (Figure 1).

3. DISCUSSION

The treatment of skeletal Class III malocclusion varies according to the patient's age group. In post-pubertal patients presenting to orthodontic clinics, both camouflage and surgical treatment options are available; however, camouflage therapy is not suitable for all cases due to the frequent presence of dentoalveolar compensation.

Teeth must be properly positioned within the alveolar bone. During orthodontic treatment, excessive retroclination of mandibular incisors and proclination of maxillary incisors should be corrected within biological limits. Ideally, the U1–SN angle should not exceed 120°, and the IMPA should not fall below 80°. Therefore, cephalometric radiographs of post-pubertal patients should be carefully evaluated. Patients whose compensations have exceeded these limits at initial presentation are candidates for surgical correction.

Skeletal Class III patients may present with maxillary deficiency, mandibular excess, or a combination of both. Therefore, surgical decompensation should be individualized based on the patient's skeletal pattern. The most commonly performed movements in orthognathic surgery for Class III patients are maxillary advancement, maxillary impaction, and mandibular setback.

According to the study by Proffit et al. (5), among these three movements, maxillary impaction is the most stable, followed by maxillary advancement, while mandibular setback is considered the least stable. During maxillary advancement, special care should be taken to maintain adequate bone contact.

A study by Haas Junior et al. in 2019 (6) further expanded the scope of these movements by evaluating the stability of surgical outcomes based on fixation types and systematic reviews. The study reported that single-jaw maxillary advancements achieved high stability when performed using either resorbable or titanium rigid internal fixation (RIF). Similarly, bilateral sagittal split osteotomy (BSSO) setback procedures with titanium RIF demonstrated high postoperative stability.

In the same hierarchical stability chart (Figure 2), the most stable movements were reported as maxillary downward movement with titanium RIF, intraoral vertical ramus osteotomy (IVRO) with maxillomandibular fixation, and surgery-first BSSO advancements with either titanium or resorbable RIF. Conversely, downward repositioning of the maxilla using resorbable fixation materials was categorized among the least stable movements.

Regarding asymmetry correction, Yoo et al. (7) investigated the transverse stability of proximal segments after mandibular setback in asymmetric and symmetric Class III cases and found no significant difference between the groups. Similarly, Hagensli et al. (8) reported that the correction of mandibular prognathism and asymmetry using BSSO with rigid fixation demonstrated considerable stability, despite moderate skeletal relapse within the first six months postoperatively.

4. CONCLUSION

Several factors influence stability in combined orthodontic–surgical treatments. These include accurate diagnosis and patient selection, appropriate timing of growth and surgery, stability of the temporomandibular joint and condylar position, dental stability, neuromuscular adaptation, surgical skill, osteotomy design, magnitude of movement, soft-tissue and muscular tension, type of mandibular rotation, adequate pre-surgical orthodontic decompensation, duration and type of intermaxillary fixation, surgical planning, fixation method, surgical technique, and type of malocclusion(9).

In our evaluation, the surgical movements planned for the five presented cases were consistent with the postoperative outcomes, demonstrating stable skeletal and occlusal results throughout the follow- up period.

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6. FIGURES



Figure 1: Preoperative & postoperative photos of third case



Figure 2: Hierarchical ranking of the stability of movements performed in orthognathic surgery (6)

7. TABLES

Table 1: Planned surgical movements for Case 1

JAW MOVEMENTS	
4 mm maxillary advancement, 1.4 mm maxillary impaction, and 0.6 mm rightward Maxilla:	translational movement.
Asymmetry correction was achieved using a combination of setback and yaw movements, Mandible: resulting in a 5 mm setback on the left side and a 2.1 mm setback on the right side.	

Table 2: Planned surgical movements for Case 2

JAW MOVEMENTS	
7 mm maxillary advancement, 1 mm rightward maxillary shift, and 2 mm maxillary impaction, with a 4° pitch rotation (clockwise) around a fixed ANS point and a 0.4° yaw	Maxilla: rotation in the clockwise direction.
For the mandible, a 4 mm setback was performed with the center of rotation at the region of tooth #37, involving a 2.3° counterclockwise pitch rotation and a 0.9° counterclockwise	
Mandible: yaw rotation.	

Table 3: Planned surgical movements for Case 3

JAW MOVEMENTS	
5 mm maxillary advancement and a 3.5° posterior impaction were performed with the	Maxilla: rotation center at the ANS.
Mandible: 1 mm mandibular setback and a 2.7° yaw rotation (centered at tooth #37)	

Table 4: Planned surgical movements for Case 4

JAW MOVEMENTS	
4 mm maxillary advancement, vertically stable on the right side, and 2 mm vertical Maxilla:	impaction on the left side.
Mandibular sagittal movement with asymmetry correction — 4 mm advancement on the right side and 1.5 mm setback on the left side, accompanied by a 0.5 mm sliding	
Mandible: advancement genioplasty.	

Table 5: Planned surgical movements for Case 5

JAW MOVEMENTS	
6 mm maxillary advancement, 2 mm maxillary impaction, 5.1° posterior rotation with the Maxilla: ANS as the fixed point, and 2° counterclockwise roll.	
4 mm advancement, 0.5 mm leftward movement, 1 mm mandibular downward movement, 4.2° counterclockwise pitch and 2.5° roll with the rotation center at tooth #47, and 2.6°	
Mandible: clockwise yaw with the same rotation center (tooth #47).	

Table 6: Cephalometric measurements were obtained at four time points: T0 (preoperative), T1 (immediately postoperative), T2 (12 months postoperative), and T3 (36 months postoperative).

Parameters	T0	T1	T2	T3
SNA	83,1	88,3	88,4	89,83
SNB	88,7	87,5	78,7	88,1
ANB	-5,6	0,8	2,1	1,2
Witt's	-7,6	-1,2	-6,3	-1,6
Mx Skeletal (A-Na Perp)(mm)	-1,6	0,9	-0,3	3,4
Mnd Skeletal (B -Na Perp)(mm)	8	5,1	3,2	8,7
Convexity	-14,1	-3,9	2,9	-3,6
Midface LengthCo-A)(mm)	80,8	83,4	84,5	75,9
SN/Go-Gn	19,5	17,3	18	15,2
FMA	17,1	18,6	15,1	14,1
Y Axis Angle	59,6	59,3	60,3	58,5
P-A Face Height	75,3	77,8	74,4	77,1
Nasolabial Angle	116,7	98,5	98,3	100,1
SN-U1	110,4	118,8	117,4	110,3
IMPA	92,5	93,1	92,3	93,2

Table 7: Cephalometric analysis values of the patient at T0 (preoperative), T1 (6 months postoperative), and T2 (12 months postoperative).

Parameters	T0	T1	T2
SNA	80,6	85,4	88,3
SNB	85,9	80,9	84,8
ANB	-5,3	1,4	3,6
Witt's	-13,1	-5,9	-3,6
Mx Skeletal (A-Na Perp)(mm)	-2,1	3,4	5,5

Mnd Skeletal (B -Na Perp)(mm)	14,7	8,1	8,2
Convexity	-14,5	-1,5	3,3
Midface LengthCo-A)(mm)	80,5	81,9	83,7
SN/Go-Gn	31,2	36,2	35,8
FMA	25,2	31,7	31,3
Y Axis Angle	62,3	64,6	63,4
P-A Face Height	68,1	60,6	60,4
Nasolabial Angle	120,1	111,2	110,3
SN-U1	108,6	105	109,1
IMPA	82	80	81

Table 8: Cephalometric analysis values of the patient at T0 (preoperative), T1 (immediate postoperative), T2 (6 months postoperative), T3 (12 months postoperative), and T4 (2 years postoperative).

Parameters	T0	T1	T2	T3	T4
SNA	76,3	79	80,8	79,7	78,9
SNB	78,2	76	78,7	76,8	76
ANB	-1,9	2,9	2,1	2,9	2,9
Witt's	-7,7	-3,3	-6,3	-3,2	-2,7
Mx Skeletal (A-Na Perp)(mm)	-6,1	1,7	-0,3	0,1	0,4
Mnd Skeletal (B -Na Perp)(mm)	-7,9	-1,6	-3,2	-3,6	-3,1
Convexity	-4,6	5	2,9	4	4,1
Midface LengthCo-A)(mm)	76,6	83,4	84,5	84,3	84,1
SN/Go-Gn	33,2	33,1	31,8	32,4	37
FMA	28,3	25,5	26,1	36,5	29
Y Axis Angle	71,4	73,5	69,9	71,8	72,8
P-A Face Height	74,5	67,5	69,8	67,6	66,5
Nasolabial Angle	121	101,4	120,2	118,7	111,8
SN-U1	107,8	102,1	102,7	105,7	104,1
IMPA	85,4	92,1	86,7	88,9	86,2

Table 9: Cephalometric analysis values of the patient at T0 (preoperative), T1 (6 months postoperative), and T2 (12 months postoperative)

Parameters	T0	T1	T2
SNA	82,4	86,1	86,4
SNB	84,1	84,2	84,6
ANB	-1,7	1,9	1,9
Witt's	-7,5	-2,1	-2,4
Mx Skeletal (A-Na Perp)(mm)	-3,1	0,1	0,3
Mnd Skeletal (B -Na Perp)(mm)	-2,4	1,8	2,7
Convexity	-3,9	-1,6	-2,1
Midface LengthCo-A)(mm)	81,6	88,8	85,1
SN/Go-Gn	24,6	21,6	21,7
FMA	24	22,3	22,1

Y Axis Angle	65,2	63,8	63
P-A Face Height	70,2	72,5	71,6
Nasolabial Angle	121	116,4	115,5
SN-U1	111,2	113	110,1
IMPA	93	92,4	91,9

Table 10: Cephalometric analysis values of the patient at T0 (preoperative), T1 (immediate postoperative), and T2 (6 months postoperative)

Parameters	T0	T1	T2
SNA	77,8	83,3	83,4
SNB	81,1	82,9	82,9
ANB	-3,3	0,5	0,5
Witt's	-7,1	-4,7	-0,7
Mx Skeletal (A-Na Perp)(mm)	-5,9	-0,9	0,2
Mnd Skeletal (B -Na Perp)(mm)	-4,9	1,8	0,5
Convexity	-7,4	-0,6	1
Midface LengthCo-A)(mm)	77,2	69,8	71,3
SN/Go-Gn	35,2	37,4	35,4
FMA	31,8	35,3	32,4
Y Axis Angle	66,2	65,1	64,9
P-A Face Height	62,2	57	58,5
Nasolabial Angle	63,7	88,1	104,4
SN-U1	105,2	107,8	109,8
IMPA	85,8	81	81,2

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**BİLATERAL KONDİL KIRİĞİ SONRASI GELİŞEN MALOKLÜZYONUN ORTOGNATİK CERRAHİ
İLE YÖNETİMİ : OLGU SUNUMU**Damla Değer1, Tuncer Akdoğan2, Mehmet Emre Benlidayı3, Mustafa Şahin3

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GİRİŞ:

Kondil kırıkları mandibula kırıklarının %30'unu oluşturur ve ilk yönetimi tartışmalıdır.(1) Açık redüksiyon ve internal fiksasyon (ORIF) pek çok çalışmada daha stabil sonuçlar sağlasa da kapalı tedavi yöntemleri özellikle intermaksiller fiksasyon (IMF) hala bazı merkezlerde uygulanmaktadır.Bilateral mandibular kondil kırıkları ,tek taraflı olgulara kıyasla oklüzyon bozukluğu ve anterior açık kapanış riskini artırdığı için tedavide açık - kapalı yaklaşım seçimi daha kritik hale gelir.Güncel sistematik derlemeler ve kılavuzlar , yüksek deplasman / angulasyon , oklüzyon stabilitenin sağlanması , fonksiyonel bozulma ve bilateral kırık varlığında açık redüksiyon - internal fiksasyon (ORIF) lehine daha güçlü kanıt bulunduğunu , açık tedavinin ağız açılığı , mandibular hareketler ve maloklüzyon oranları açısından kapalı tedaviye üstün olduğu bildirilmektedir.(9) Öte yandan kapalı tedavi az deplasmanlı olgularda kabul edilebilir sonuç verebilir (10); ancak IMF sonrası literatürde maloklüzyon , anterior açık kapanış , konuşma bozuklukları ve temporomandibular eklem fonksiyon kayıpları gibi komplikasyonlar bildirilmektedir.(2,3) Bu tür sekonder deformiteler , hastalarda fonksiyonel şikayetlerin devam etmesine yol açmakta ve revizyon cerrahisi ihtiyacını doğurmaktadır. Litaratürde , bu olguların tedavisinde eklem protezi gibi majör rekonsüktif yaklaşımardan ziyade fonksiyonel oklüzyonu yeniden tesis etmeye odaklanan ortognatik cerrahının özellikle bilateral sagittal split osteotomi (BSSO) veya Lefort 1 osteotomi ile başarılı sonuçlar verdiği gösterilmiştir.(4) Bu vakamızda bilateral kondil kırığı olan hastanın kapalı tedavi sonrası oluşan fonksiyonel oklüzyon bozukluğunu bilateral sagittal split osteotomisi yaklaşımını sunacağım.

VAKA :

35 yaşında kadın hasta , düşme sonrası gelişen travmaya bağlı deplase bilateral kondil kırığı nedeniyle başka bir merkezde kapalı yöntem ile intermaksiller fiksasyon uygulanarak iki hafta süreyle tedavi edilmiş.Ancak tedavi sonrasında hastada belirgin anterior açık kapanış , maloklüzyon ve artikülasyon bozukluğu (peltek konuşma) şikayetleri ortaya çıkmış . Bu yakınlarda nedeniyle hasta, travmadan yaklaşık 2 ay sonra Çukurova Üniversitesi Diş Hekimliği Fakültesi Ağız Diş ve Çene Cerrahisi kliniğimize başvurdu.Alınan anamnezde hastanın sistemik bir rahatsızlığı olmadığı öğrenildi. Klinik muayenede , fonksiyonel oklüzyon kaybı , anterior açık kapanış ve çiğneme zorlukları saptandı. Temporomandibular eklem hareket açığının yeterli olduğu ve eklemde ankiyoz bulgusu olmadığı belirlendi. Hastanın alınan panoramik ve konik işinli bilgisayarlı tomografi (CBCT) görüntülerinin değerlendirilmesinde ramus boyunun kısalığı ve kondil bölgesinde malunion saptandı. Hastanın mevcut fonksiyonel şikayetlerini gidermek amacıyla , bilateral sagittal split osetotomi (BSSO) ile oklüzyonun düzeltmesine karar verildi. Genel anestezi altında intraoral yaklaşım ile monopolar koter kullanılarak retromolar pad'den başlayarak birinci molar bölgesine kadar vestibüler insizyon yapıldı.Mukoperiosteal flap kaldırılarak ramusun lateral yüzeyi ortaya çıkarıldı.Künt direksiyon lingual tarafta nervus lingualis korunarak lingula mandibula görünene kadar devam edildi.Horizontal ve vertikal osteotomi hatları belirlendikten sonra piezocerrahi ile kesiler yapıldı.Çenenin doğru konumlandırılması final Split ile sağlanarak mandibula 10 mm öne alındı ve counter-clockwise

yapılarak hareket ettirildi ve rıjıt fiksasyon yapıldı. Flap primer olarak suture edildi. Hastanın ameliyat sonrası iyileşmesi hem hasta açısından hem de cerrahi ekibi tarafından tatmin ediciydi.

TARTIŞMA :

Mandibular kondil kırıkları, tüm mandibula kırıkları içerisinde en sık karşılaşılanlardan biridir ve travma sonrası ortaya çıkan fonksiyonel, estetik ve artikülasyon bozuklukları nedeniyle klinik açıdan önemli bir problem oluşturmaktadır [7]. Mandibular kondil kırıklarının tedavisinde amaç, hem fonksiyonel oklüzyonun hem de temporomandibular eklem hareket açıklığının korunmasıdır. Tedavi yaklaşımı, özellikle açık redüksiyon - internal fiksasyon (ORIF) ile kapalı tedavi (intermaksiller fiksasyon-IMF) arasında halen tartışmalıdır. Kapalı tedavi, uzun yıllardır geleneksel yöntem olarak uygulanmakta olup minimal invazivliği, düşük morbiditesi ve teknik kolaylığı nedeniyle tercih edilmektedir. Ancak literatürde uzun süreli IMF'nin komplikasyonları arasında anterior açık kapanış, maloklüzyon, deviasyon, konuşma bozuklukları ve TMJ disfonksiyonu gibi komplikasyonların görülebildiği sıkça rapor edilmiştir. (5) Özellikle bilateral kondil kırıkları sonrası gelişen açık kapanış deformiteleri, sekonder dönemde hasta konforunu ciddi şekilde etkilemektedir. Bu nedenle güncel eğilim, fonksiyonel sonuçları öne çıkaran açık cerrahi yaklaşılara doğru kaymaktadır.

Açık tedavi (ORIF) ile kondil kırıklarının stabil şekilde fiks edilmesi, daha iyi oklüzal ilişki, daha hızlı fonksiyonel rehabilitasyon ve daha düşük maloklüzyon oranları ile ilişkilendirilmiştir. Schneider ve ark. (2008), prospektif randomize çalışmalarında ORIF uygulanan grupta fonksiyonel sonuçların anlamlı derecede daha iyi olduğunu göstermiştir [6]. Bununla birlikte, açık cerrahi; fasiyal sinir hasarı, skar oluşumu ve cerrahi morbidite risklerini de beraberinde getirmektedir [8]. Güncel kılavuzlar; tedavi yaklaşımında özellikle yüksek deplasmanlı, bilateral ve fonksiyonel maloklüzyon riski taşıyan kırıklarda ORIF önerirken, minimal deplasmanlı ve stabil oklüzyonlu olgularda kapalı tedavi halen uygun bir seçenek olarak değerlendirilmektedir. (1)

Kapalı tedavi sonrası gelişen sekonder deformite vakalarında tedavi seçeneği fonksiyonel şikayetlerin şiddetine ve eklem durumuna bağlı olarak değişmektedir. Eklem protezi veya rekonsüktif girişimler yerine, fonksiyonel rehabilitasyonu hedefleyen ortognatik cerrahi yöntemler ön plana çıkmaktadır. Literatürde bu konu ile ilgili önemli seriler mevcuttur. Becking ve arkadaşları kondil kırığı sonrası gelişen maloklüzyonlu 21 hastanın tedavisinde, özellikle bilateral açık anterior kapanış olgularında BSSO ve Lefort 1 osteotomi ile başarılı ve stabil sonuçlar elde edildiğini rapor etmiştir. (4) Ellis ve arkadaşları ise, IMF sonrası gelişen sekonder maloklüzyonlarda konservatif tedavilerin yetersiz kaldığını, ortognatik cerrahının ise fonksiyonel ve estetik açıdan daha tatmin edici sonuçlar sağladığını vurgulamaktadır (2) Benzer şekilde Nilesh ve arkadaşları post travmatik maloklüzyonların yönetiminde BSSO'nun güvenilir ve stabil bir seçenek olduğunu belirtmiştir. (3) Güncel olarak Sidebottom ve arkadaşları da, temporomandibular eklem fonksiyonunun korunmuş olduğu ve ankiloz gibi ağır eklem patolojilerinin bulunmadığı vakalarda, ortognatik cerrahının eklem protezi gibi major girişimlerden önce tercih edilmesi gerektiğini vurgulamaktadır. (1)

Bizim vakamızda, kapalı yöntemle tedavi edilen bilateral kondil kırığı sonrası, hasta anterior açık kapanış, maloklüzyon ve konuşma bozukluğu şikayetleri ile başvurmuştur. Fonksiyonel değerlendirmede eklem hareket açıklığının yeterli olduğu, ankiloz bulgusu bulunmadığı ve esas problemin oklüzal malpozisyon olduğu görülmüştür. Bu nedenle, literatürle uyumlu olarak eklem cerrahisi ya da protezi yerine BSSO tercih edilmiş, hastanın fonksiyonel oklüzyonu yeniden tesis edilmiştir. Bu yaklaşım, hem fonksiyonel şikayetleri gidermiş hem de hastanın artikülasyon ve çiğneme fonksiyonlarında belirgin iyileşme sağlamıştır.

SONUÇ:

Sonuç olarak, mandibular kondil kırıklarının tedavisinde halen tek tip bir yaklaşım bulunmamakla birlikte, fonksiyonel sonuçlar açısından açık tedavi yöntemleri öne çıkmaktadır. Bununla birlikte, travma sonrası sekonder deformite gelişen olgularda ortognatik cerrahi, estetikten ziyade fonksiyonel

rehabilitasyonu önceliklendiren, öngörülebilir ve literatürle desteklenen bir tedavi seçeneği olarak önemini korumaktadır.

MANAGEMENT of MALOCCLUSION FOLLOWING BILATERAL CONDYLAR FRACTURE with ORTHOGNATHIC SURGERY : A CASE REPORT

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INTRODUCTION:

Condylar fractures account for approximately 30% of mandibular fractures, and their initial management remains controversial (1). Although open reduction and internal fixation (ORIF) has been shown in many studies to provide more stable outcomes, closed treatment methods—particularly intermaxillary fixation (IMF)—are still employed in some centers. Bilateral mandibular condylar fractures make the choice between open and closed approaches more critical compared with unilateral cases, as they carry an increased risk of malocclusion and anterior open bite. Current systematic reviews and guidelines report stronger evidence in favor of ORIF in cases with severe displacement/angulation, occlusal instability, functional impairment, and bilateral fractures. Open treatment has been shown to be superior to closed treatment in terms of mouth opening, mandibular mobility, and malocclusion rates (9). On the other hand, closed treatment may provide acceptable results in cases with minimal displacement (10); however, complications such as malocclusion, anterior open bite, speech disorders, and temporomandibular joint dysfunction following IMF have been reported in the literature (2,3). Such secondary deformities may lead to persistent functional complaints and the need for revision surgery. In the literature, orthognathic surgery—particularly bilateral sagittal split osteotomy (BSSO) or Le Fort I osteotomy—has been shown to yield successful outcomes in these cases by re-establishing functional occlusion, rather than resorting to major reconstructive approaches such as joint prostheses (4). In this case, we present the management of functional occlusal disorder following closed treatment of bilateral condylar fractures with bilateral sagittal split osteotomy.

Case Report

A 35-year-old female patient had sustained displaced bilateral condylar fractures due to trauma following a fall. She had initially been treated at another center with intermaxillary fixation (IMF) for two weeks using a closed technique. However, after treatment she developed a marked anterior open bite, malocclusion, and articulation disorder (lisping). Due to these complaints, the patient presented to the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University, approximately two months after the trauma. Medical history revealed no systemic diseases. Clinical examination demonstrated loss of functional occlusion, anterior open bite, and difficulty in mastication.

Temporomandibular joint movements were within normal limits, and no signs of ankylosis were detected. Panoramic radiograph and cone beam computed tomography (CBCT) imaging revealed shortened ramus height and malunion in the condylar region.

To resolve the patient's functional complaints, correction of occlusion with bilateral sagittal split osteotomy (BSSO) was planned. Under general anesthesia, an intraoral approach was performed with a vestibular incision made using monopolar cautery, extending from the retromolar pad to the first molar region. After elevating a mucoperiosteal flap, the lateral surface of the ramus was exposed. The

lingual side was bluntly dissected with protection of the lingual nerve until the mandibular lingula was visualized. Horizontal and vertical osteotomy lines were determined, and osteotomies were performed with piezosurgery. Correct mandibular positioning was achieved with the final split technique; the mandible was advanced 10 mm and rotated counter-clockwise. Rigid fixation was performed, and the flap was closed primarily. Postoperative recovery was uneventful and satisfactory both for the patient and the surgical team.

DISCUSSION

Mandibular condylar fractures are among the most common mandibular fractures and represent an important clinical problem due to the functional, esthetic, and articulation disorders that may occur after trauma [7]. The primary goal in the management of mandibular condylar fractures is the preservation of both functional occlusion and temporomandibular joint (TMJ) mobility. Treatment approaches, particularly open reduction and internal fixation (ORIF) versus closed treatment (intermaxillary fixation—IMF), remain a matter of debate. Closed treatment has long been considered the traditional method and is often preferred because of its minimally invasive nature, lower morbidity, and technical simplicity. However, the literature has frequently reported complications of prolonged IMF, including anterior open bite, malocclusion, deviation, speech disorders, and TMJ dysfunction (5). Especially in cases of bilateral condylar fractures, open bite deformities developing in the secondary period may significantly impair patient comfort. Consequently, the current trend has shifted toward open surgical approaches that prioritize functional outcomes.

ORIF provides stable fixation of condylar fractures and has been associated with improved occlusal relationships, faster functional rehabilitation, and lower rates of malocclusion. Schneider et al. (2008), in a prospective randomized study, demonstrated that functional outcomes were significantly better in the ORIF group [6]. Nevertheless, open surgery carries risks such as facial nerve injury, scar formation, and surgical morbidity [8]. Current guidelines recommend ORIF particularly in cases with severe displacement, bilateral fractures, or a high risk of functional malocclusion, whereas closed treatment remains an acceptable option for minimally displaced fractures with stable occlusion (1).

In cases of secondary deformities after closed treatment, the therapeutic choice depends on the severity of functional complaints and the condition of the joint. Instead of prosthetic replacement or major reconstructive procedures, orthognathic surgery aiming at functional rehabilitation comes to the forefront. Several important case series have been reported in the literature. Becking et al. treated 21 patients with malocclusion after condylar fracture and reported that BSSO and Le Fort I osteotomy achieved successful and stable results, particularly in bilateral anterior open bite cases (4). Ellis et al. emphasized that conservative treatments were inadequate for secondary malocclusions after IMF, whereas orthognathic surgery provided more satisfactory functional and esthetic outcomes (2). Similarly, Nilesh et al. highlighted BSSO as a reliable and stable option in the management of post-traumatic malocclusions (3). More recently, Sidebottom et al. also underlined that in cases where TMJ function is preserved and severe joint pathologies such as ankylosis are absent, orthognathic surgery should be preferred before considering major interventions such as joint prostheses (1).

In our case, the patient presented with anterior open bite, malocclusion, and speech disorder following closed treatment of bilateral condylar fractures. Functional assessment revealed adequate joint mobility, absence of ankylosis, and the main problem being occlusal malposition. Therefore, in line with the literature, BSSO was chosen over joint surgery or prosthetic replacement, and the patient's functional occlusion was re-established. This approach successfully resolved the functional complaints and provided significant improvement in articulation and masticatory function.

CONCLUSION

In conclusion, although there is still no single universally accepted approach in the management of mandibular condylar fractures, open treatment methods are increasingly favored due to their superior functional outcomes. Furthermore, in cases where secondary deformities develop after trauma,

orthognathic surgery remains an important treatment option that prioritizes functional rehabilitation over esthetics, providing a predictable and literature-supported solution.

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Temporomandibular Eklem Bozukluklarının Yönetiminde Artrosentez: Olgu Sunumu ve Literatür DerlemesiBerkan Duman1, Betül Gedik2, Gülce Ecem Doğancalı2, Mehmet Ali Erdem21stİstanbul Üniversitesi, Sağlık Bilimleri Enstitüsü, Ağız Diş ve Çene Cerrahisi Anabilim Dalı, İstanbul
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Temporomandibular eklem bozuklukları (TMEB) toplumun yaklaşık %5–12'sini etkileyen ve kronik bel ağrısından sonra en sık görülen ikinci kas-iskelet sistemi rahatsızlığıdır (1). Bu bozukluklar, çene ekleminde ağrı, hareket kısıtlılığı ve fonksiyon bozukluğu ile seyreden heterojen bir grup hastalığı içermektedir (2).

Temporomandibular eklem bozukluklarında ilk tedavi yaklaşımı genellikle antiinflamatuvar ilaçlar, fizik tedavi, ısırma splintleri gibi non-invaziv konservatif yöntemlerdir. Ancak hastaların %10–25'inde konservatif tedaviye yanıt yetersiz kalmakta ve semptomlar kronikleşebilmektedir (3). Bu durumda minimal invaziv girişimler, özellikle artrosentez ve artroskopi gündeme gelmektedir (2).

Artrosentez, 1991 yılında Nitzan tarafından tanımlanan, üst eklem boşluğunun serum fizyolojik veya Ringer laktat gibi solüsyonlarla yikanarak eklem içi basıncın düzenlenmesini, adezyonların açılmasını ve inflamatuar mediatörlerin uzaklaştırılmasını amaçlayan bir yöntemdir (4). Bu mekanizma, inflamatuar sitokinlerin uzaklaştırılmasını, "suction cup" etkisi olarak adlandırılan negatif basıncın ortadan kaldırılmasını ve fibröz bantların çözülmektedir (5). Literatürde, artrosentezin kapalı çene kilitlenmesi olgularında %80'in üzerinde başarı oranlarına sahip, güvenli ve maliyet-etkin bir yöntem olduğu bildirilmiştir (3). Konservatif tedaviye dirençli TME ağrısı ve hareket kısıtlılığı durumlarında artrosentez, günümüzde standart bir girişim olarak kabul görmektedir (2). Ayrıca bazı araştırmalar, konservatif yöntemleri uzun süre denemek yerine minimal invaziv girişimlere (artrosentez veya artroskopi) erken dönemde geçilmesinin, semptomları daha hızlı düzeltileceğini ve kronikleşmeyi önleyebileceğini ortaya koymuştur (2, 3).

Son yıllarda artrosentez tekniğinde ve eklem içine uygulanan ajanlarda önemli gelişmeler yaşanmıştır. Geleneksel çift iğneli yöntem yanı sıra, tek iğne ile uygulama teknikleri geliştirilmiş; ayrıca eklem içine hyaluronik asit (HA), kortikosteroid, Platelet Rich Plasma (PRP), injectable Platelet Rich Fibrin (i-PRF), kemik iliği konsantresi (BMAC) ve mikro-fragmente yağ dokusu gibi çeşitli ajanların eklenmesiyle etkinin artırılması amaçlanmıştır (1, 6). Bununla birlikte, bu değişkenler arasında en iyi yaklaşım konusunda henüz tam bir fikir birliği bulunmamaktadır. Bu derlemede vaka sunumunun ardından artrosentezin TMEB tedavisindeki yeri güncel literatür ışığında tartışılmak; teknik farklılıklar, zamanlama ve eklem içi enjeksiyon materyallerinin sonuçlara etkisi mevcut kanıtlar doğrultusunda değerlendirilecektir.

Vaka Sunumu

30 yaşındaki kadın hasta, temporomandibular eklem (TME) ağrısı şikayetiyle İstanbul Üniversitesi Diş Hekimliği Fakültesi'ne başvurdu. Anamnezinde yaklaşık 1 yıl boyunca okluzal splint kullandığı, ancak bu tedaviden belirgin bir fayda görmediği ve eklem ağrularının azalmadığı öğrenildi. Devam eden şikayetleri nedeniyle hasta ileri değerlendirme ve tedavi için cerrahi kliniğine yönlendirildi. Yapılan klinik muayene ve ardından çekilen manyetik rezonans (MR) görüntülemesi sonucunda redüksiyonlu disk deplasmanı tanısı konuldu. Bu tanı doğrultusunda, konservatif tedaviden sonuç alınamadığı için artrosentez uygulanmasına karar verildi.

İşlem öncesinde hasta, şikayet ve muayene bulgularının sistematik olarak değerlendirildiği Temporomandibular Eklem Muayene ve Takip Formu'nu doldurdu. Bu formda, hastaya şikayetinin ne zaman başladığı, sık sık baş ağrısı yayayıp yaşamadığı, yemek yerken tek taraflı çığneme alışkanlığı olup olmadığı ve ailede benzer şikayetlerin bulunup bulunmadığı gibi kısa cevaplı sorular yöneltildi. Ayrıca hastanın vizuel analog skala (VAS) ile ağrı şiddeti, maksimum ağrısız interinsizal açıklığı,

çığneme kaslarında palpasyonla ağrı mevcudiyeti, eklem sesleri (örneğin klik) ve mandibulada deviasyon veya defleksiyon olup olmadığı gibi klinik muayene bulguları ayrıntılı olarak kaydedildi. Artrosentez işlemi, planlandığı şekilde hastanın daha fazla ağrı hissettiği sağ TME'ye uygulandı. İşlem günü eklem bölgesi antiseptik solüsyonla dezenfekte edildikten sonra çift iğne giriş tekniği kullanılarak eklem boşluğununda Ringer laktat solüsyonu ile yıkama gerçekleştirildi. Lavaj başarılı bir şekilde tamamlandıktan sonra eklem boşluğu hyalüronik asit içeren solüsyon ile son bir kez yıkandı ve ilgili bölgeye basınç bandajı uygulandı. İşlem sonrası dönemde hastaya dikkat etmesi gereken hususlar ayrıntılı olarak açıklandı; ağrı kesici, antibiyotik ve kas gevşetici ilaçlar reçete edilerek düzenli kullanması önerildi. Hasta belirli aralıklarla kontrol muayenelerine çağrılarak takibe alındı.

Yapılan kontrollerde, artrosentez uygulanan sağ tarafta 3. ve 6. ay değerlendirmelerinde ağrı şiddetinde belirgin azalma ve maksimum ağız açıklığında artış tespit edildi. Ancak işleminden yaklaşık 1 yıl sonra hastanın sol taraf TME bölgesindeki ağrılarının yeniden belirgin biçimde arttığı gözlandı. Bunun üzerine sol TME için de artrosentez planlanarak uygulandı. Sol eklemde MR incelemesinde eklem aralığının ciddi derecede daraldığı saptandı. Bu nedenle sol tarafta eklem boşluğunun yıkaması teknik olarak nispeten güçlükle gerçekleştirilmiş olsa da işlem sonrası sol taraf ağrısında da bir miktar azalma sağlandı. Hasta halen düzenli aralıklarla kontrol edilmekte olup klinik bulguları yakından izlenmektedir.

Tartışma

Artrosentez, konservatif tedaviye dirençli temporomandibular eklem bozukluklarında başvurulan ilk minimal invaziv yöntemlerden biridir. Literatürde, bu tekniğin ağrıyı azalttığını ve maksimum ağız açıklığını artırdığını tutarlı biçimde gösterilmiştir (2). Klasik yaklaşım, üst eklem boşluğuna yerleştirilen iki iğne aracılığıyla sıvı verilmesi ve drenajın sağlanması esasına dayanır. Son yıllarda ise işlemi kolaylaştırmak ve komplikasyon riskini azaltmak amacıyla tek girişli teknikler geliştirilmiştir. Bu teknikte aynı noktadan sıvı giriş ve çıkışı sağlanmakta ve çift lümenli kanüller kullanılabilir. Karşılaştırmalı çalışmalar, tek ve çift iğne yöntemleri arasında klinik sonuçlar açısından anlamlı bir fark olmadığını, yalnızca çift iğne tekniğinde ağrı azalmasının kısmen daha belirgin olabileceğini bildirmektedir (4). Benzer şekilde Nagori ve ark. tarafından yapılan güncel bir meta-analizde, tek ve çift girişli artrosentez teknikleri arasında postoperatif ağrı skorları ve maksimum ağız açıklığı açısından anlamlı fark bulunmamıştır. Bu durum, yöntemin etkinliğinin esasen lavaj etkisine dayandığını göstermektedir. Ancak işlemel farklılıklar açısından tek girişli teknik, operasyon süresini kısaltması ve iğne yerinin yeniden ayarlanma ihtiyacını azaltmasıyla öne çıkmaktadır. Bu avantajlar, işlem konforunu artırarak komplikasyon riskini azaltabileceğinden, sınırlı veriler ışığında klinik pratikte tercih edilebilir bir seçenek olarak önerilmektedir (5).

Artrosentezin yalnız lavaj etkisiyle ağrı ve fonksiyon üzerinde yarar sağladığı bilinmekle birlikte, post-lavaj intraartiküler enjeksiyonların ek katkı sağlayabileceği düşüncesiyle çok sayıda ajan incelenmiştir (1, 6, 7). Geleneksel hyaluronik asit (HA) kayganlaştırıcı ve anti-inflamatuvar özellikleri nedeniyle yaygın biçimde kullanılmaktadır (7). Yılmaz ve ark. tarafından yapılan randomize kontrollü bir çalışmada, disk deplasmanlı TMEB hastalarında yalnızca eklem içine hyaluronik asit (HA) enjeksiyonu ile artrosentez sonrası HA uygulaması karşılaştırılmıştır. Altı aylık takipte her iki grupta da ağrı, ağız açıklığı ve çığneme fonksiyonunda anlamlı iyileşme kaydedilmiş, buna karşın tedavi almayan kontrol grubunda düzelleme gözlenmemiştir. Özellikle artrosentez ile HA kombinasyonu, hem redüksiyonlu hem de redüksiyonsuz disk deplasmanı olgularında çığneme etkinliği ve yaşam kalitesinde tek başına HA enjeksiyonuna kıyasla daha üstün bulunmuştur. Bu sonuçlar, eklem lavajının eklem içi basıncı azaltarak ve inflamatuar ortamı temizleyerek konservatif tedaviye dirençli vakalarda belirgin klinik fayda sağladığını göstermektedir (9,2).

Nagori ve ark. (2024) tarafından yapılan meta-analiz, artrosentez sonrası PRP veya PRF enjeksiyonunun yalnızca artrosenteze göre ağrı azalması ve maksimum ağız açıklığında ek iyileşme sağladığını, ancak iki yöntem arasında anlamlı fark bulunmadığını göstermiştir. Bununla birlikte, hazırlama protokollerindeki heterojenite ve etki büyülüğünün görece düşük olması nedeniyle sonuçların klinik açıdan sınırlı yorumlanması gereği vurgulanmıştır (6).

Li ve Chen'in meta-analizi, artrosentez sonrası PRP ve HA uygulamalarının ağrı ve ağız açıklığı açısından benzer etkinlik gösterdiğini ortaya koymuştur (7). Bu nedenle klinik seçim hasta özellikleri ve

tercihler doğrultusunda yapılabilir. Ayrıca kombinasyon stratejileri de gündemdedir. Nitekim Zhang ve ark. tarafından yapılan ağ-meta analizinde kısa dönemde HA+PRP, orta dönemde i-PRF ve uzun dönemde BMAC en etkili seçenekler olarak bildirilmiştir (1) Bu ajanlar, özellikle dejeneratif eklem patolojilerinde umut verici görünümekle birlikte, uzun dönemde etkinlik ve güvenliklerinin belirlenmesi için ileri çalışmalarla ihtiyaç vardır (7,1).

Eklem içi kortikosteroid ve analjezik enjeksiyonları da artrosentez ile birlikte sıkça tartışılan diğer tedavi modifikasyonlarıdır (2, 10). Steroidler güçlü antiinflamatuvar etkileriyle akut dönemde ağrıyi hızla azaltabilir; fakat eklem kırkıdağı üzerindeki olası olumsuz etkileri nedeniyle kullanımı konusunda farklı görüşler mevcuttur (2).

Liu ve ark. (2020) tarafından yapılan meta-analiz, artrosentez sonrası eklem içine uygulanan NSAID ve opioid enjeksiyonlarını değerlendirmiştir. Dokuz RCT'nin incelendiği çalışmada, NSAID enjeksiyonlarının postoperatif ağrı veya ağız açıklığı üzerine placeboya göre ek fayda sağlama olmadığı görülmüştür. Buna karşılık opioid enjeksiyonları, özellikle kısa dönemde belirgin avantaj göstermiş; 1. hafta, 1. ay ve 3. ayda ağrı skorlarında anlamlı azalma ve erken dönemde maksimum ağız açıklığında artış rapor edilmiştir. Bu etkinin 6. ayda yalnızca ağrı kontrolü açısından sürdüğü bildirilmiştir. Ancak örneklem büyüklüklerinin küçük ve çalışmaların kalitesinin düşük olması nedeniyle bulgular dikkatle yorumlanmalıdır. Ayrıca opioidlerin potansiyel yan etkileri göz önünde bulundurulduğunda, rutin kullanımı önerilmemekte; yalnızca seçilmiş şiddetli vakalarda kısa süreli bir seçenek olarak değerlendirilmektedir (10).

Artrosentezin etkinliğini değerlendirmek için literatürde, bu yöntemin artroskopi veya tamamen konservatif tedavi ile karşılaşıldığı çalışmalar da mevcuttur. Tang ve ark. (2) tarafından yapılan sistematik derlemede, artrosentez ve artroskopinin ağrı kontrolü ve komplikasyon oranları açısından benzer olduğu; ancak orta dönemde artroskopinin maksimum ağız açıklığında yaklaşık 5 mm daha fazla artış sağladığı bildirilmiştir. İleri cerrahinin ise artrosenteze üstünlüğü gösterilememiştir. Genel olarak her iki minimal invaziv yaklaşım konservatif tedaviden daha etkili bulunmuş, ancak hangi basamakta uygulanması gerektiği konusunda kesin bir görüş birliği sağlanamamıştır. Kronikleşme eğilimi olan olgularda girişimin geciktirilmemesi, özellikle üç ay içinde konservatif tedaviye yanıt alınmayanlarda artrosentezin daha iyi sonuç verebileceği ileri sürülmektedir. Bununla birlikte, tedavi zamanlaması mutlaka hasta özelliklerine göre bireyselleştirilmelidir (2).

Artrosentez sırasında giriş yerinin belirlenmesi ve iğne yönlendirilmesi konusunda da teknik modifikasyonlar araştırılmıştır. Klasik yöntemde anatomik işaretlere dayalı kör giriş yapılrken, ultrason eşliğinde artrosentez gibi görüntüleme destekli yaklaşımlar değerlendirilmiştir. Teorik olarak ultrason intraartiküler yerleşimi kolaylaştırabilir; ancak Hu ve ark. (11) tarafından yapılan dört RCT'yi içeren sistematik derleme, kısa dönemde (1 hafta–1 ay) ağrı ve ağız açıklığı açısından klasik yöntemle anlamlı fark göstermemiştir. İşlemsel ölçütler açısından da bulgular heterojen olup belirgin bir üstünlük saptanmamıştır. Bu nedenle ultrason rehberliği rutin kullanım için önerilmemekte, yalnızca zor anatomilerde yardımcı bir seçenek olarak düşünülmektedir.

Sonuç

Temporomandibular eklem bozuklıklarının tedavisinde artrosentez, konservatif yöntemlerle başarı sağlanamayan olgular için değerli bir minimal invaziv seçenek olarak öne çıkmaktadır. Güncel derleme ve meta-analizler, artrosentezin eklem ağrısını azaltmada ve ağız açıklığını artırmada anlamlı derecede etkili olduğunu göstermektedir (1, 2). Farklı teknikler (tek veya çift iğne girişimi, görüntüleme eşliğinde uygulama gibi) arasında klinik sonuçlar büyük ölçüde benzer olup, deneyime ve olanaklara göre her iki yaklaşım da uygulanabilir görülmektedir (4, 5, 11). Özellikle tek girişli çift lümenli teknik, daha kısa operasyon süresi ve kolaylık avantajıyla pratikte tercih edilebilecek bir alternatiftir (5). Eklem içi enjeksiyon konusunda, artrosentez ile kombine edilen PRP, i-PRF, BMAC gibi biyolojik ajanlar kısa ve uzun vadeli sonuçları bir miktar iyileştirebilmektedir (1, 6). Bunun yanı sıra HA ile PRP'nin benzer etkinlikte olması, uygun durumda HA'nın da kullanılabilceğini desteklemektedir (7). Yine de bu ajanların katkısının klinik anlamda ne ölçüde önemli olduğu tartışmalı olup, hasta özeline karar verilmelidir (6, 7). Mevcut kanıtlara dayanarak, artrosentezin tedavi algoritmasında konservatif yöntemlerin başarısız olduğu veya uygun görülmemiş durumlarda geciktirilmeden uygulanması önerilir (2, 3). Klinik pratikte, her ne kadar artrosentez genel olarak güvenli ve başarılı bir

yöntem olsa da en ideal uygulama tekniği ve eklem içi sıvı seçimi konusunda daha fazla araştırmaya ihtiyaç vardır. Son olarak, artrosentezin uzun dönem etkinliğini ve en ideal uygulama protokollerini ortaya koymak üzere, daha uzun takip süreli ve kaliteli klinik çalışmalara ihtiyaç olduğu açıklar.

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GENÇ TAOMS TAM METİN

From Function to Aesthetics: The Bidirectional Effect of Orthognathic Surgery

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Abstract:

Objective: Orthognathic surgery is a treatment approach that provides not only functional improvements but also significant enhancements in facial aesthetics by correcting skeletal discrepancies of the jaws. The main objective of this presentation is dual interaction between the functional and aesthetic aspects of orthognathic surgery.

Materials and Methods: For this purpose, the current literature and up-to-date data is discussed.

Results: Orthognathic surgery should consider function and aesthetics not as separate entities, but as two complementary components. While the procedure has functional effects on mastication, respiration, speech, and overall quality of life, its aesthetic contributions to facial proportions and profile balance should also be emphasized.

Conclusion: Facial proportions and balances must be carefully evaluated during preoperative planning. Today, with the support of digital surgical planning techniques, when combined with appropriate surgical methods, esthetic-functional approach provides the most ideal and long-lasting postoperative outcomes.

Keywords: facial esthetics; maxillofacial surgery; orthognathic surgery

1. Introduction

Orthognathic surgery has shown remarkable progress throughout the years, with its foundations first laid by a case report published by Hullihen in 1849(1). This case report, which documented the first surgical procedure performed on a mandible deformed as a result of burn injury, is regarded as the historical starting point of orthognathic surgery in literature.

While surgical interventions on the jaws initially focused solely on functional correction, they evolved into today's modern aesthetic-functional integrative approach through the contributions of Obwegeser in the 20th century(2,3). In his article in which he described the sagittal split technique, the author emphasized that a new technique was needed because the existing methods addressed only a single type of deformity, and this opened the door to an aesthetic perspective by expanding the range of cases that could be treated(3).

The primary goal of orthognathic surgery is to correct the occlusion, thereby improving mastication and speech, as well as influencing the patient's airway volume and posture(4,5,6).

In orthognathic surgery, aesthetic enhancement follows functional improvement; however, the combination of both yields the most stable and enduring outcome. Therefore, it is crucial to know the effect of orthognathic surgery on overall facial appearance. Nose is the most affected facial feature by orthognathic surgery. Most esthetically pleasing outcomes are achieved with maxillary advancement; with the nasal tip rotating upward and a depression occurring in the supratip region, but the alar base width might increase(7). Leon et al. have developed a Le Fort I osteotomy technique that has no effect on nasal appearance(8). This technique also prevents the loss of nasal bone support and preserves the nasal chamber volume. For the mandible, a modified mandibular sagittal split osteotomy is described by Ferri et al.(9). This technique guarantees a less visible antegonial notch by performing the vertical cut of the lower mandibular border in the area of the masseter-pterygoid sling. As for notching in the parasymphysis region of the mandible that can be encountered after genioplasty, chin wing osteotomy is designed for its prevention(10). This modified genioplasty osteotomy also aids in the correction of basilar border asymmetries, skin tension, better definition of the mandibular angles.

2. Discussion

The esthetic outcomes of orthognathic surgery have recently become a highly popular research topic, because beyond being solely a skeletal intervention, orthognathic surgery significantly influences facial harmony by affecting soft-tissue balance, nasal morphology, lip posture, and airway function(11).

In a case series that investigates patients' motivation before and satisfaction after orthognathic surgery, it has been observed that although patients primarily report functional complaints before surgery, they often do not recall these concerns postoperatively and instead state that aesthetic considerations become more prominent(12). In other words, even if patients initially seek orthognathic surgery for functional improvement, they may later prioritize aesthetic outcomes, provided they are satisfied with the postoperative changes. Therefore, planning from an aesthetic perspective is of great importance.

A retrospective cohort study where the effect of orthognathic surgery on the long-term quality of life was evaluated revealed that patients' satisfaction from the orthognathic surgical procedure was mostly a result of improvements in facial esthetics, followed by psychological well-being and then functional abilities. Additionally, most dissatisfaction after the orthognathic surgical procedure was related to nasal appearance(13).

Since orthognathic surgery, particularly Le Fort I osteotomy, affects the nasal morphology(7), it would only be appropriate to take possible nasal changes into account during pre-surgical planning phase. Also, Özal et al. found that nasal esthetic parameters can solely be achieved by orthognathic surgery, eliminating patients' need for rhinoplasty(14).

3. Conclusion

By evaluating all facial compartments as a unified whole and planning orthognathic surgery with the understanding that they must remain in harmony, it becomes possible to achieve highly satisfying outcomes for both the patient and the surgeon.

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AMELOBLASTOMADA CERRAHİ SPEKTRUM: HASTAYA ÖZEL STRATEJİK YAKLAŞIM

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Ameloblastoma, lokal agresif özellik gösteren benign epitelyal bir tümör olup, maksillofasial bölgedeki odontojenik lezyonların önemli bir bölümünü oluşturmaktadır. Dental lamina, mine organı, odontojenik kist epiteli veya bazal epitel hücrelerinden köken alabileceği bildirilmiştir. Klinik olarak genellikle yavaş büyüyen, ağrısız bir şişlik olarak ortaya çıkmakta ve kortikal kemikte ekspansiyona yol açmaktadır. Bu durum, zamanla fonksiyonel ve estetik bozukluklara neden olabilmektedir. Ayrıca yavaş büyümeye paterninin çoğunlukla tanı koyulmasında gecikmeye yol açtığı da ifade edilmiştir.

Her ne kadar benign kabul edilse de ameloblastomanın invaziv davranış göstermesi, nüks riskinin yüksek olmasına neden olmaktadır. Ameloblastomanın temel tedavi yaklaşımı; enükleasyon, küretaj ve hatta marsupializasyon gibi konservatif tedavilerden marginal veya segmental rezeksiyon gibi daha radikal yöntemlere kadar çeşitlilik göstermektedir. Bazı olgularda nüks riskini azaltmak amacıyla konservatif cerrahiye ek olarak Carnoy solüsyonu da uygulanabilmektedir. Bu cerrahi strateji; tümörün tipi, boyutu, lokalizasyonu ve klinik özelliklerinin yanı sıra hastanın yaşı ve sosyoekonomik durumu gibi bireysel faktörler de dikkate alınarak belirlenmektedir.

Konservatif yaklaşımın daha az agresif tiplerde kullanılabilıldığı ve kısa operasyon süresi, normal hayatı hızlı dönüş ve rekonstrüksiyon kolaylığı gibi avantajlar sağlayabildiği bildirilmektedir. Buna karşılık, daha yüksek nüks oranları ve ek cerrahi gereksinimleriyle ilişkili olabileceği de ifade edilmiştir. Agresif tipteki ameloblastomalar için ise radikal cerrahi yöntemler tercih edildiği bildirilmiştir. Radikal cerrahiler daha düşük nüks oranlarına sahiptir fakat sıklıkla kemik devamlılığının bozulmasına, yumuşak doku kayıplarına ve estetik ya da fonksiyonel açıdan önemli defektlerin oluşmasına neden olmaktadır. Bu durum da hem fonksiyonel hem de estetik sonuçların yeniden sağlanması amacıyla rekonstrüksiyonu zorlaştırmaktadır. Rekonstrüksiyon yöntemleri arasında otolog kemik greftleri, serbest vaskülerize doku

greftleri ve alloplastik materyaller yer almaktadır. Özellikle kondiler bölgeyi içeren geniş rezeksiyonlarda, temporomandibular eklem(TME) fonksiyonunun yeniden sağlanması amacıyla TME protezleri, anatomik uyum ve fonksiyonel stabilitet açısından önemli bir seçenek olarak değerlendirilmektedir.

Bu sunumda, kliniğimizde tedavi edilen ameloblastoma olgularına uygulanan farklı cerrahi yaklaşımalar derlenmiş ve cerrahi stratejinin hastaya ve lezyon özelliklerine göre bireyselleştirilmesinin; nüks riskinin azaltılmasında, fonksiyonel yapıların korunmasında ve estetik sonuçların iyileştirilmesinde oynayabileceği rol vurgulanmıştır.

THE SURGICAL SPECTRUM OF AMELOBLASTOMA: A PATIENT-SPECIFIC STRATEGIC APPROACH

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Ameloblastoma is a locally aggressive benign tumor of epithelial origin, representing a considerable proportion of odontogenic lesions in the maxillofacial region. Clinically, ameloblastoma typically presents as a slow-growing, painless swelling that causes cortical bone expansion. Over time, this may lead to functional impairment and aesthetic deformity. Diagnosis is often delayed, likely due to its indolent growth pattern.

Despite its benign nature, ameloblastoma exhibits aggressive behavior and is associated with a high risk of recurrence. Management strategies range from conservative procedures, such as enucleation, curettage, and marsupialization, to radical approaches including marginal or segmental resection. In some cases, Carnoy's solution is applied as an adjunct to conservative surgery to reduce the risk of recurrence. The choice of surgical technique depends on multiple factors, including tumor type, size, location, clinical behavior, and patient-related considerations such as age and socioeconomic status.

Conservative techniques may be appropriate for less aggressive lesions and offer advantages such as shorter operative time, faster recovery, and simpler reconstruction, although they have been associated with higher recurrence rates. Radical surgery is generally preferred for aggressive lesions, achieving lower recurrence but often resulting in significant hard and soft tissue defects. These consequences may complicate subsequent reconstruction aimed at restoring both function and appearance. Reconstruction techniques include autologous bone grafts, free vascularized flaps, and alloplastic materials. In resections involving the condylar region, temporomandibular joint prostheses provide functional stability and anatomical compatibility.

This presentation reviews various surgical approaches applied to ameloblastoma cases treated in our clinic and highlights the potential role of tailoring the surgical strategy to patient and lesion-specific characteristics in reducing recurrence risk, preserving functional structures, and improving aesthetic outcomes.

VESTIBULOPLASTY AND REPOSITIONAL FLAP: A NEW TECHNIQUE

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Abstract

Objective: Severe alveolar ridge resorption causes a reduction in vestibular depth and a loss of keratinized mucosa, both of which adversely affect prosthesis stability and peri-soft tissue health. In such cases, vestibuloplasty combined with excision of the hypermobile mucosa is commonly performed; however, this approach often leads to the complete loss of the remaining keratinized tissue.

Case: The Pedicled Repositional Split-Flap Technique was developed to reposition keratinized but hypermobile mucosa onto the alveolar crest without the need for a donor site. This method is applied in combination with Clark's vestibuloplasty, providing simultaneous vestibular deepening and stabilization of the mucosa while preserving its keratinized character. In the treated cases, an average gain of 7 mm of immobile, keratinized-character mucosa was achieved. The repositioned tissue maintained its stability and keratinized features throughout the follow-up period.

Conclusion: The proposed technique offers an effective, safe, and low-morbidity option for achieving a stable soft-tissue surface in severely resorbed mandibles—both prior to prosthetic rehabilitation and for increasing the amount of keratinized-character mucosa in implant-planned areas.

Key words: Vestibuloplasty, hypermobile tissue, mucosal repositioning

1. Introduction

Severe alveolar ridge resorption that develops after long-term edentulism results in reduced vestibular depth, loss of keratinized mucosa, and the formation of hypermobile soft-tissue folds on the residual ridge (1–3). These changes decrease the retention and stability of prostheses and adversely affect peri-soft tissue health (3).

In cases where bone grafting is not planned but vestibular depth is insufficient, vestibuloplasty combined with excision of the hypermobile mucosa is commonly performed (4).

The presence of keratinized mucosa is crucial not only for patients using removable prostheses but also for those receiving dental implants, as it contributes to peri-implant tissue health, hygiene control, and patient comfort (5). Although autologous tissue grafts such as free gingival grafts can be used for this purpose, they require a second surgical site and therefore cause additional morbidity (6).

This report introduces the Pedicled Repositional Split-Flap Technique, which eliminates the need for a donor site and enables the repositioning of keratinized yet hypermobile mucosa onto the edentulous ridge. When combined with classical vestibuloplasty, this approach aims to enhance prosthesis stability and achieve keratinized-character mucosa without creating a secondary surgical site, particularly in anterior regions planned for implant placement.

2. Case Report

The technique was applied after detailed explanation of the procedure and obtaining written informed consent from all participants. Both patients were female, aged 64 and 65 years, and had no systemic diseases.

All operations were performed under local anesthesia with a vasoconstrictor (articaine + epinephrine 1:100,000) following the classical Clark vestibuloplasty approach. A partial-thickness incision was made along the mucogingival junction near the crest of the alveolar ridge. The overlying mucosa was carefully separated from the periosteum and released in an inferior direction to increase the vestibular depth. The oral mucosa was then adapted to the base of the vestibule and secured using 4/0 resorbable sutures, completing the vestibuloplasty stage.

In the second stage, the mobile keratinized mucosa over the ridge was targeted. Two vertical, partial-thickness releasing incisions were made at the mesial and distal borders of this mucosal band. A careful dissection was performed to elevate a keratinized, mobile flap while maintaining its lingual attachment. The split keratinized flap was then repositioned apically over the exposed periosteal surface created during vestibuloplasty and stabilized with 5/0 resorbable sutures (Figure 1).

Postoperatively, patients were prescribed systemic antibiotics, analgesics, and chlorhexidine mouthwash. Clinical evaluations were performed on the 3rd postoperative day and at the 3rd week. The repositioned mucosa showed uneventful healing with no signs of infection or dehiscence, and the vestibular depth was preserved during early follow-up. Preoperative and follow-up photographs of Case 1 are presented in Figure 2, whereas those of Case 2 are shown in Figure 3.

The second case was re-evaluated 8 months postoperatively, showing a stable vestibular depth and immobile mucosa that retained its keratinized character (Figure 4).

3. Discussion

The most distinctive advantage of the Pedicled Repositional Split-Flap Technique is the transformation of a functionally unfavorable, mobile soft-tissue band into one of the most valuable oral mucosal types, immobile mucosa with keratinized character. Such tissue provides a stable base for removable prostheses and acts as a biological barrier that contributes to peri-implant health and maintenance (3,6,7).

Among the commonly used methods for increasing the amount of keratinized-character mucosa, the free gingival graft (FGG) remains one of the most established techniques. In this procedure, mucosa with keratinized character harvested from the palate is transplanted onto a prepared recipient bed and secured with sutures. The success of the graft depends critically on its immobility and adequate vascularization from the underlying periosteum (8). Any movement or insufficient perfusion may lead to graft failure. Moreover, because FGG requires a second surgical site, donor site-related complications such as bleeding, pain, and infection may occur during the postoperative period (6,9).

The Pedicled Repositional Split-Flap Technique eliminates the need for a donor site, offering a major advantage in terms of patient comfort and reduced morbidity. Since the flap remains pedicled and nourished by the lingual vasculature, perfusion is supported not only from the recipient periosteal surface but also from its own vascular network. This dual blood supply may theoretically reduce ischemic risk. Additionally, the flap can be stabilized to the periosteum with simple sutures placed along its anterior margin, without requiring complex suturing techniques. This simplicity may contribute to shorter operative time and minimize the risk of circulation compromise that may result from excessive suturing.

In the mandible, excision of hypermobile soft tissues is typically recommended in non-grafted cases (4,10). In contrast, this technique preserves keratinized-character mucosa by repositioning, rather than excising, the mobile tissue over the alveolar crest. Compared with the excision approach, each millimeter of immobile tissue gained through repositioning represents a biologically meaningful improvement. In the present cases, an average of 7 mm of immobile mucosa with keratinized character was achieved. Although previous studies have explored tissue stiffening via sclerosing agent injection, such approaches are no longer in clinical use (7).

When compared with FGG, the amount of keratinized-character mucosa obtained through this method appears comparable; however, the absence of a donor site provides a clear advantage in postoperative comfort. A prerequisite for the use of this technique is that the hypermobile mucosa over the ridge must already possess keratinized characteristics, therefore, its indication is limited to selected patients with such mucosal features.

Histologically, hypermobile tissue is characterized as hyperplastic fibrous tissue, in which a small number of inflammatory cells may occasionally be observed. As long as the epithelial integrity remains intact, significant inflammation is typically absent. Although variations in epithelial thickness may occur, maturation generally remains normal (3). Nonetheless, the long-term stability and histologic properties of the immobile, keratinized-character mucosa obtained with this technique should be further evaluated and compared with those achieved by FGG in future clinical and histopathological studies.

For successful outcomes, it is essential to detach muscular attachments and fibrous bands from the crest and reposition the flap onto stable periosteal tissue. To this end, Clark's vestibuloplasty technique was applied in this study. However, in severely resorbed mandibles where the mental foramen lies close to the ridge crest, this approach should be applied cautiously.

Furthermore, because the Pedicled Repositional Split-Flap Technique covers the periosteal surface that would otherwise heal by secondary intention after Clark's vestibuloplasty, it effectively minimizes the secondary wound area. The influence of this feature on postoperative pain and healing duration should be investigated in future clinical studies.

4. Conclusion

The Pedicled Repositional Split-Flap Technique can be safely applied in patients with severely resorbed mandibles who present with hypermobile mucosa of keratinized character over the alveolar crest, provided that no surgical contraindications exist. It offers an effective and low-morbidity option for creating a stable supporting surface prior to removable prosthetic rehabilitation or for increasing the amount of keratinized-character mucosa in the anterior mandibular region before implant placement.

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6. Figures

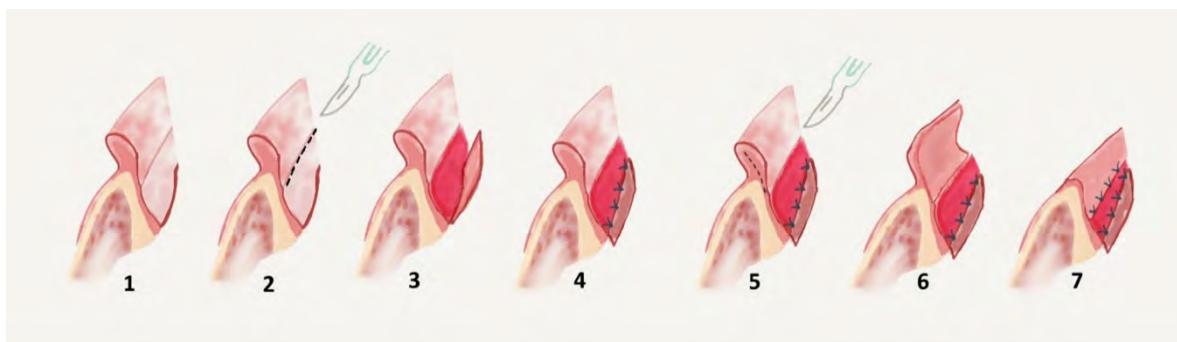


Figure 1. Stepwise application of the pedicled repositional split-flap technique: (1) Preoperative view, (2) Partial-thickness incision along the margin of the keratinized mucosa, (3) Inferior dissection from the periosteum to increase vestibular depth, (4) Suturing of the oral mucosa to the base, (5) Planned incision line for splitting the mobile keratinized tissue indicated with dashed lines, (6) Mobilized flap with preserved lingual pedicle after splitting, (7) Apical advancement and fixation of the flap with sutures.

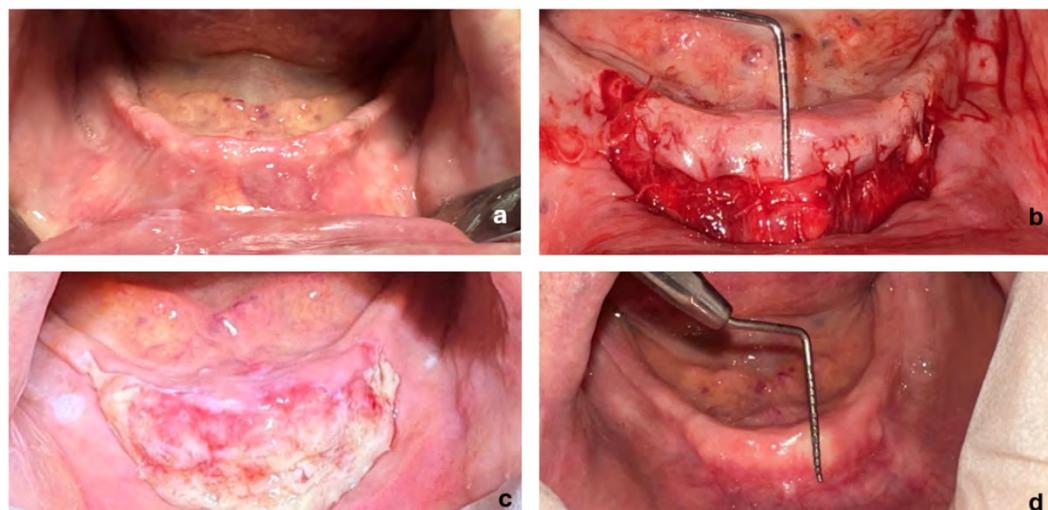


Figure 2. Intraoperative views of Case 1 (a) preoperative; (b) immediate postoperative; (c) postoperative day 3; (d) postoperative day 20.

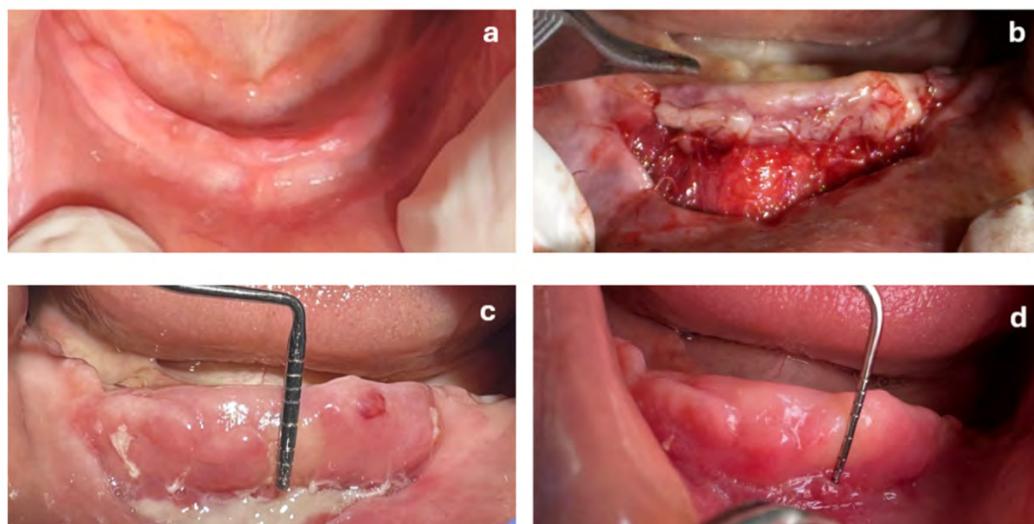


Figure 3. Intraoperative views of Case 2 (a) preoperative; (b) immediate postoperative; (c) postoperative day 3; (d) postoperative day 20.



Figure 4. Intraoperative view of Case 2 at the 8th postoperative month.

Clinical Pearls in Reconstruction Plate Application

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Abstract

Objective:

Pathologic fractures of the mandible represent a major complication in the surgical treatment of large cysts and benign tumors. This study aimed to evaluate the indications and limitations of reconstruction plate application and to assess its role in preventing mandibular pathologic fractures.

Materials and Methods:

A retrospective analysis was conducted on patients treated at Istanbul University between November 2024 and October 2025. Inclusion criteria were mandibular cysts or benign tumors requiring enucleation, curettage, or resection with concomitant reconstruction plate placement. Malignant lesions, trauma history, and systemic conditions impairing bone healing were excluded. Demographic, clinical, and surgical data were reviewed. Outcomes included plate indications, complications, and postoperative follow-up of at least 6 months.

Results:

Eight patients (7 males, 1 female; mean age: 46 years) met the inclusion criteria. The most frequent indication for plate application was marked cortical thinning and large bony defects. Lesions were predominantly located in the mandibular body, followed by the angle and symphysis regions. During a mean follow-up of 10 months, no pathologic fractures were observed. Complication rates were low, with no plate exposure, loosening, or fracture, and only one case of localized infection.

Conclusion:

Reconstruction plates are an effective preventive measure against mandibular pathologic fractures in high-risk cases. Proper case selection and surgical experience are critical for minimizing complications. Prophylactic plate application can safely be performed under local anesthesia and remains a reliable strategy for maintaining mandibular integrity in benign lesions.

Key Words: mandibular fracture, reconstruction plate, benign pathology

Introduction

Pathologic fractures of the mandible represent a significant complication in the surgical management of large cysts and benign tumors. It has been reported that 81.8% of mandibular pathologic fractures are associated with radiolucent lesions [1]. The highest frequency of fractures has been observed in lesions located in the third molar region [2-4].

These lesions often cause marked thinning or destruction of the cortical bone, thereby increasing the susceptibility of the mandible to fracture either during or after surgery. Consequently, preventive stabilization methods such as reconstruction plates are widely employed to preserve mandibular integrity and to reduce fracture-related morbidity. However, the indications and limitations of plate use in benign pathologies remain controversial. While some authors advocate routine prophylactic plating in extensive defects, others recommend a more selective approach based on lesion size, location, and bone quality [5].

The aim of this study is to evaluate the indications and limitations of reconstruction plate application in such cases, to investigate its role in preventing pathologic mandibular fractures, and to provide clinical insights.

Results

A total of 8 patients (7 males, 1 female) who underwent surgical treatment for large mandibular cysts or benign tumors with reconstruction plate application were included in the study.

The most common indication for plate placement was extensive cortical thinning and large bone defects. Lesions were most frequently located in the mandibular body, followed by the angle and symphysis regions.

During a mean follow-up period of 10 months, no pathological fractures were observed in any of the cases.

Complications related to plate application were minimal. No plate exposure occurred, and localized infection was not observed. No plate fracture or loosening was recorded.

Discussion

Pathologic fractures of the mandible are among the most important complications in the surgical management of large cysts and benign tumors (Figure 1). The risk is particularly higher in the angle region, as masticatory forces and bending moments generated by hypertrophic masseter muscles impose the greatest load on the mandible in patients with molar occlusion (Figure 2). The position of the lesion, its inferior extension, and its relationship with the cortical plates are the most critical factors determining the likelihood of fracture. In our study, prophylactic rigid fixation was selectively applied in cases where the lesion approached the basal bone, where residual bone height was less than 10 mm, or where cortical perforation was present (Figure 3). Conversely, in patients with intact basal and lingual cortices, a conservative approach was preferred, and no fractures occurred in these cases. The absence of pathologic fractures in patients who underwent simultaneous enucleation and reconstruction plate application confirms the protective role of rigid fixation when appropriately indicated.

Our findings are consistent with previous biomechanical and clinical studies. Murakami et al. used finite element analysis in a virtual environment to investigate stress distribution in the mandible after cyst enucleation and demonstrated that disruption of cortical continuity increases the risk of microdamage and pathologic fracture in the residual bone. The same study reported that miniplate placement significantly reduced stress concentrations, thereby highlighting the theoretical efficacy of reinforcement strategies [6]. These biomechanical data support the use of plates, particularly in lesions extending into the angle region and inferiorly.

In our series, preoperative three-dimensional (3D) models were generated and reconstruction plates were pre-bent prior to surgery (Figure 4). This workflow improved plate–bone conformity and contour accuracy, reduced intraoperative trial-and-error bending, and likely shortened operative time. It also limited periosteal stripping and facilitated soft-tissue preservation, while allowing pre-planned screw

trajectories that respected tooth roots and the inferior alveolar canal. These practical advantages provide a direct bridge between the biomechanical rationale and the favorable clinical outcomes observed in our cohort.[7]

From a clinical perspective, reconstruction plates have been shown to be a reliable method in benign mandibular pathologies. İşler et al., in a retrospective study of 23 patients, reported that plate application was effective in preserving mandibular integrity, while the complication rates remained manageable. Although minor complications such as screw loosening, plate exposure, and paresthesia were observed, most of these were associated with disarticulation resections or the use of non-locking plates. The study specifically emphasized that locking plates reduced complication rates [8]. Similarly, in our series, no major complications were encountered despite the potential risks, underscoring the importance of surgical experience and appropriate case selection.

Considering the morbidity of a second surgical intervention in the event of a pathologic fracture, prophylactic plate application in high-risk cases protects patients from additional surgical trauma. Naturally, plate application also carries possible disadvantages (inferior alveolar nerve injury, screw loosening, infection, etc.). However, both the literature and our series demonstrate that the incidence of such complications in high-risk cases is low and far more tolerable compared to a pathologic fracture [6, 8].

In our study, all surgeries were performed under local anesthesia or local anesthesia with sedation support. This demonstrates that rigid fixation procedures can be safely performed without the need for general anesthesia. Nevertheless, certain limitations remain: inability to fully control muscle tone under local anesthesia, prolonged operative time, and the exclusion of cases extending to the condyle are among the main ones.

Clinical Pearls

1. Identify high-risk cases early: Large defects at the angle/body, residual bone height ≤ 10 mm, or basal bone/lingual cortex compromise → consider prophylactic rigid fixation. ; third-molar region carries elevated fracture risk.
2. Plate before or concomitant with lesion removal to prevent intraoperative green-stick fractures; FEM shows plating reduces stress concentrations after cyst/tumor surgery.
3. Choose a load-bearing 2.4 mm locking reconstruction plate for extensive cortical thinning; aim for $\geq 3-4$ bicortical screws per side and overlap 2–3 holes onto healthy bone.
4. Inferior border placement with anatomic contouring respects mandibular biomechanics and reduces failure risk in the angle region.
5. Preoperative imaging and planning: Use CBCT-based planning to optimize screw trajectories and plate adaptation. Favor bicortical fixation along the inferior border and monocortical screws superior to the canal to protect tooth roots and the inferior alveolar nerve. In suitable cases, virtual surgical planning (VSP) with pre-bent/patient-specific plates may shorten operative time and improve fit.
6. Safe screw trajectory: avoid tooth roots and the inferior alveolar canal; bicortical purchase when feasible.
7. Locking systems may reduce complications (loosening/exposure) while preserving continuity in benign disease.
8. Soft-tissue principles: minimal periosteal stripping, tension-free closure → lower exposure/infection rates.
9. Anesthesia & aftercare: local (\pm sedation) is feasible in selected cases; soft diet and activity restriction help mitigate fracture risk.

- Follow-up: ≥6–10 months without pathologic fracture supports the preventive role of plating when case selection is correct.

Conclusion

Reconstruction plates represent a reliable preventive approach for maintaining mandibular integrity in the surgical management of large cysts and benign tumors. Their use is particularly beneficial in high-risk cases with cortical thinning, basal bone involvement, or large defects. When applied with proper case selection and surgical expertise, prophylactic rigid fixation effectively reduces the risk of pathologic fracture with minimal complication rates. Thus, reconstruction plate application should be considered as a safe and valuable adjunct in the management of benign mandibular pathologies.

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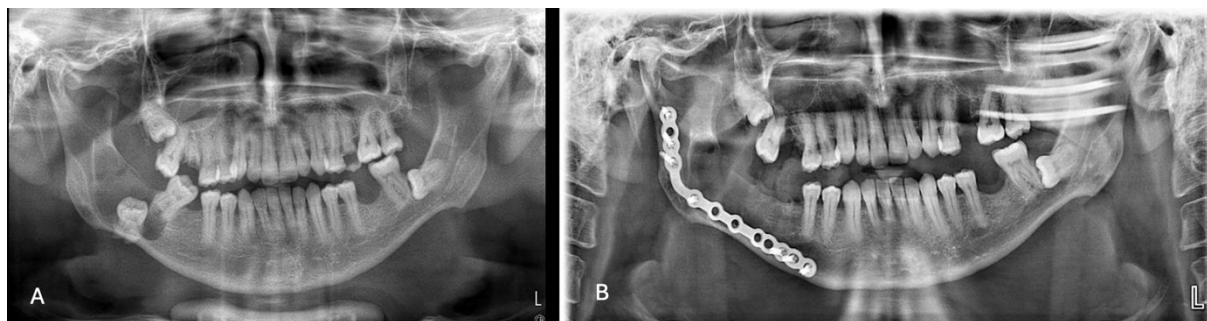
Figures

Figure 1: (A) Preoperative panoramic radiograph showing a large mandibular cyst. (B) Postoperative panoramic view following surgical management and reconstruction plate application.

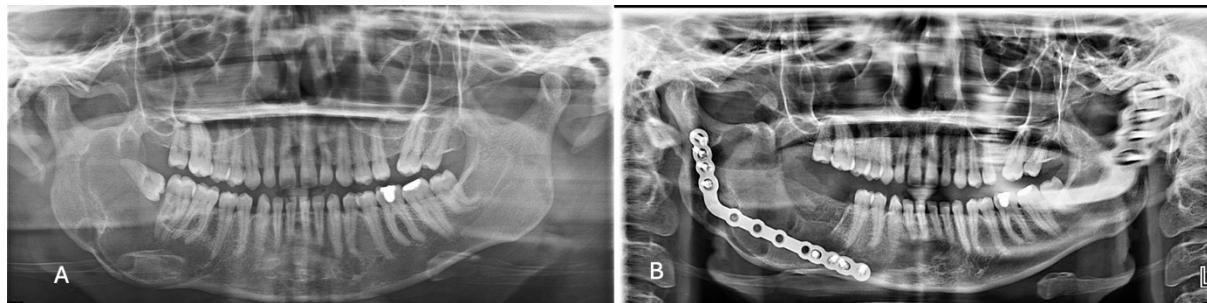


Figure 2: A) Large lesion located in the mandibular angle region. (B) Postoperative radiograph following surgical management and reconstruction plate fixation.

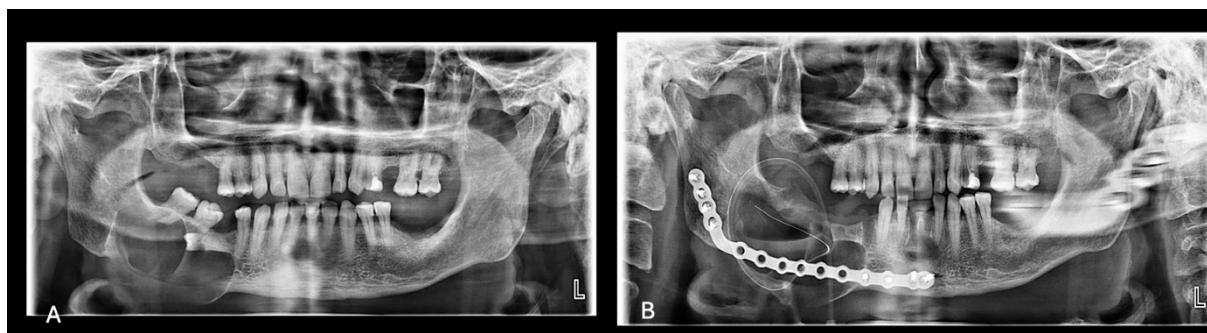


Figure 3: (A) Mandibular lesion with perforation extending close to the basal border, indicating a high risk of fracture. (B) Postoperative panoramic radiograph following surgical management and reconstruction plate application.



Figure 4: Pre-bent reconstruction plate adapted on the mandibular model.

CLINICAL TIPS IN TEMPOROMANDIBULAR JOINT LAVAGE

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Abstract

Objective: This study aims to provide practical recommendations to improve the effectiveness of temporomandibular joint (TMJ) lavage (arthrocentesis) in patients with internal derangements who do not adequately benefit from conservative treatment. The objective is to highlight essential anatomical considerations, technical parameters, and evidence-based procedural tips that contribute to predictable clinical outcomes.

Materials and Methods: This presentation is based on current literature, clinical observations, and procedural experience with TMJ arthrocentesis. Reviewed parameters include patient selection criteria, anatomical landmarks guiding needle insertion, optimal entry angles, preferred lavage solutions, and recommended irrigation volumes. The potential benefits of adjunctive intra-articular agents, including hyaluronic acid and corticosteroids, were also evaluated. Technical factors influencing success—such as joint space distention, mechanical lysis of adhesions, and maintenance of adequate lavage flow—were analyzed to develop practical guidelines for clinicians.

Results: Evidence from multiple clinical studies shows that TMJ lavage provides meaningful reductions in pain and improvements in maximal mouth opening, particularly in early-stage internal derangements. Higher success rates are associated with accurate needle placement, sufficient irrigation volume, and performing the procedure before major degenerative changes appear. Combining lavage with intra-articular injections may enhance long-term symptom control and patient satisfaction. Clinical experience indicates that careful attention to anatomical variation and precise technique minimizes complications and supports functional recovery.

Conclusion: TMJ arthrocentesis is a safe, minimally invasive, and effective treatment option for well-selected patients. Optimizing case selection, refining technical steps, and incorporating adjunctive therapies can significantly improve overall clinical outcomes.

Key Words: TMJ Arthrocentesis, Internal Derangement, Lavage Technique

Introduction

Temporomandibular joint (TMJ) disorders encompass a broad spectrum of musculoskeletal pathologies that compromise the structural and functional integrity of the masticatory system(1). Among these,

internal derangement represents the most common intra-articular disorder and is characterized by an abnormal positional relationship between the articular disc and mandibular condyle(2). This condition frequently leads to increased intra-articular pressure, accumulation of inflammatory mediators, synovial irritation, the development of fibrous adhesions, and progressive limitation of mandibular movement(3). Clinical manifestations commonly include pain, clicking, joint stiffness, headaches, and restricted mouth opening, which may significantly reduce the patient's quality of life. Although conservative therapies such as nonsteroidal anti-inflammatory drugs, occlusal splints, physical therapy, and behavioral interventions are considered first-line treatments, a considerable proportion of patients do not experience satisfactory improvement and require minimally invasive or surgical interventions(4).

Arthrocentesis is widely recognized as an effective and minimally invasive procedure designed to restore joint mobility by irrigating the superior joint compartment with isotonic saline or lactated Ringer's solution. The primary therapeutic mechanisms involve the removal of inflammatory biochemical mediators, reduction of intra-articular pressure, mechanical separation of adhesions through hydraulic distention, and re-establishment of physiological joint mechanics(5). Clinical studies have consistently shown substantial pain reduction and significant improvements in maximal mouth opening following the procedure, particularly in early- and mid-stage internal derangement. The success of arthrocentesis is influenced by multiple factors including accurate identification of anatomical landmarks, appropriate needle angulation and depth, adequate irrigation volume, and meticulous technical execution. Over the years, several modified techniques such as single-needle arthrocentesis, classical double-needle arthrocentesis, high-pressure modified techniques, cannula-based systems, and arthroscopy-assisted lavage have been developed to optimize clinical outcomes(6). Understanding the nuances of each approach is essential for appropriate technique selection and clinical decision-making.

Materials and Methods

This review is based on an extensive evaluation of the existing literature on TMJ arthrocentesis, focusing on clinical studies, randomized controlled trials, systematic reviews, and meta-analyses published in the last two decades. The literature search was performed using PubMed, Scopus, Web of Science, and Cochrane Library databases, with keywords including "TMJ arthrocentesis," "internal derangement," "single-needle technique," "double-needle technique," "hydraulic distention," and "arthroscopy-assisted lavage." Only studies involving adult patients with internal derangement and reporting clinical outcomes such as pain scores, maximal mouth opening, and functional improvement were included.

The review included studies employing classical double-needle arthrocentesis, single-needle arthrocentesis, modified high-pressure techniques, cannula-assisted systems, and arthroscopy-assisted lavage. Although each technique has unique procedural characteristics, all share the common goal of disrupting adhesions and removing inflammatory mediators through pressurized irrigation. The classical double-needle technique served as the reference method for evaluating anatomical precision. This standard technique typically involves positioning the first needle approximately 10 mm anterior and 2 mm inferior to the tragus along the tragus–lateral canthus line to access the superior joint

compartment. Once distention occurs, the second needle is inserted roughly 20–25 mm anterior to the first, allowing inflow and outflow of the irrigating solution. Studies were analyzed for sample size, irrigation volume, type of irrigating solution, use of adjunctive intra-articular agents such as hyaluronic acid or platelet-rich plasma, follow-up period, complications, and overall treatment success.

Description of Arthrocentesis Techniques

Different arthrocentesis techniques have been developed to enhance irrigation efficiency, patient comfort, and clinical efficacy. The classical double-needle arthrocentesis remains the most widely adopted technique. By allowing simultaneous inflow and outflow of irrigating fluid, this technique ensures continuous lavage of inflammatory byproducts and provides stable hydraulic pressure capable of mechanically disrupting intra-articular adhesions(7). Its effectiveness and favorable safety profile make it the preferred option for most early- and mid-stage internal derangement cases.

In contrast, the single-needle arthrocentesis technique was introduced to simplify the procedure by reducing invasiveness(8). This method uses a single needle connected to a Y-shaped apparatus that enables both inflow and outflow through the same entry point. While it offers advantages in terms of patient comfort and reduced soft tissue trauma, its capacity to generate sufficient hydraulic pressure is limited, and therefore it may be less effective in cases requiring vigorous adhesion release(9). Nevertheless, it remains a useful option for patients with significant anxiety, anatomical limitations, or those who do not tolerate multiple needle insertions.

The modified high-pressure double-needle technique aims to increase turbulence and hydraulic force within the joint space(10). By inserting two needles closer together or by using narrower gauge needles, clinicians can significantly enhance the mechanical lysis of adhesions. This method has been shown to yield superior improvements in mouth opening, particularly in cases with dense fibrous adhesions or chronic limitation of movement. Cannula-assisted arthrocentesis represents another modification in which rigid or flexible cannulas replace standard needles. Cannulas provide improved stability, reduce the risk of accidental needle movement, and facilitate more controlled irrigation, making them especially useful in patients requiring repeated procedures.

Arthroscopy-assisted arthrocentesis represents the most sophisticated variation, combining lavage with direct visualization of the joint space. This approach allows clinicians to identify synovitis, adhesions, disc displacement, and degenerative changes, while simultaneously performing targeted adhesion release under visual control(11). Although arthroscopy-assisted procedures require more specialized training and equipment, they may offer superior long-term outcomes in advanced internal derangement and degenerative joint disease.

Hydraulic distention techniques, used either alone or as part of other variations, emphasize the generation of higher intra-articular pressure prior to lavage. By creating separation between the articular disc and the fossa, this method enhances mechanical release of adhesions and often leads to immediate

improvements in mandibular mobility. These techniques are particularly beneficial in cases where adhesions significantly restrict movement.

Results

Across the reviewed literature, arthrocentesis consistently demonstrated clinically meaningful improvements in both pain and functional outcomes(12). Pain scores on the Visual Analog Scale, typically ranging from 6 to 8 before treatment, were reduced to between 1 and 3 following the procedure. Improvements in maximal mouth opening were equally significant, rising from approximately 28–32 mm preoperatively to 38–45 mm at follow-up. Studies comparing different arthrocentesis techniques generally reported that double-needle and high-pressure modified techniques yielded the greatest improvements in cases with significant adhesions, whereas single-needle approaches were more effective in mild-to-moderate internal derangement(13).

Combining arthrocentesis with intra-articular injections further enhanced outcomes. Hyaluronic acid demonstrated restorative effects on lubrication and viscoelastic properties of the joint, whereas corticosteroids offered short-term anti-inflammatory benefits without consistent long-term improvement(14). Platelet-rich plasma showed promising regenerative potential, particularly in improving long-term pain control and joint mobility; however, variability in preparation and administration protocols limited definitive conclusions. Complications associated with arthrocentesis were minimal and generally transient, including mild swelling, localized tenderness, rare temporary facial nerve involvement, and very infrequent cases of intra-articular air. Importantly, no severe long-term complications were identified in the reviewed studies(15).

Discussion

The findings of this comprehensive review indicate that arthrocentesis is an effective and safe minimally invasive procedure for managing internal derangement, especially when conservative treatment fails. The success of the procedure depends heavily on accurate anatomical knowledge, needle placement, irrigation pressure, and careful technique. While the classical double-needle approach remains a reliable method, variations such as high-pressure techniques, cannula-assisted approaches, and arthroscopy-assisted arthrocentesis offer additional benefits depending on the complexity of the case. Technique selection should therefore be individualized based on the stage of pathology, anatomical characteristics, and the clinician's experience.

Hydraulic distention plays an essential role in the mechanical release of adhesions, and adequate irrigation volume is necessary to flush inflammatory mediators effectively. Adjunctive therapies such as hyaluronic acid and platelet-rich plasma have become increasingly important in enhancing long-term outcomes, particularly in terms of pain suppression and joint mobility. Patient-related factors—including psychological status, parafunctional habits like bruxism, and chronic muscle hyperactivity—also influence treatment response and should be considered during planning. The overall evidence strongly

suggests that arthrocentesis offers rapid symptomatic relief, improved mandibular function, and durable outcomes, with minimal risk of complications.

Conclusion

TMJ arthrocentesis, whether performed using single-needle, double-needle, modified techniques, cannula systems, or arthroscopy-assisted methods, is a highly effective and reliable treatment for internal derangement that does not respond to conservative therapy. Proper patient selection, precise anatomical assessment, meticulous execution of technical steps, and the strategic use of adjunctive intra-articular agents significantly enhance treatment success. Current evidence supports arthrocentesis as a valuable short- and long-term therapeutic option for restoring function, reducing pain, and improving overall quality of life in patients with temporomandibular joint internal derangement.

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