

Case Report

A Collaborative Approach to Managing Complex Dental Conditions

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ABSTRACT

Effectively addressing complex dental conditions requires a coordinated effort across multiple specialties and a well-structured treatment plan. This case report outlines the comprehensive care of a 27-year-old Saudi male who presented with a high susceptibility to caries, multiple missing teeth, extensive decay, super-erupted dentition, and inadequate root canal therapy. The management strategy included preventive measures, determination of tooth restorability, extraction of non-salvageable teeth, dietary assessment, caries treatment, endodontic therapy, and pre-prosthetic surgical procedures such as periodontal interventions and implant placement. Occlusal analysis and adjustments were performed before final prosthodontic rehabilitation to ensure functional stability. The treatment plan prioritized the collection of essential diagnostic records to facilitate optimal dental function. A multidisciplinary approach involving restorative dentistry, endodontics, prosthodontics, and periodontics was key to reestablishing oral health, function, and aesthetics. This case highlights the vital role of collaborative care and tailored treatment strategies in managing complex dental issues. Through teamwork, the patient's oral health was restored by addressing plaque-induced gingivitis, occlusal trauma, high caries risk, and multiple compromised teeth, ultimately improving both function and overall dental stability.

Keywords: Case study, Dental physiology, Complex dental cases, Interdisciplinary dentistry, Treatment planning

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Introduction

Providing patients with the most effective and up-to-date treatments is a fundamental responsibility of healthcare professionals. However, various circumstances can sometimes hinder the ability to deliver optimal care. Misdiagnosis and inappropriate treatment can lead to severe complications, and despite

good intentions, errors often occur due to uncertainties and overlooked details [1]. A thorough understanding of interdisciplinary principles plays a vital role in achieving both functional and aesthetic success in full-mouth rehabilitation. Since every patient differs in personality, age, and expectations, treatment plans must be tailored accordingly. A strong grasp of these

interdisciplinary concepts broadens the range of available treatment approaches and potential outcomes. In modern dentistry, practitioners must recognize how different specialties integrate to achieve biologically sound and conservative aesthetic transformations [2]. The primary objective is to enhance diagnostics, treatment planning, and the resolution of functional and aesthetic challenges through a systematic approach. This process includes the use of temporary restorations as a guide for the final prosthetic outcome. Through interdisciplinary expertise and collaboration, clinicians can approach full-mouth rehabilitation with precision, ensuring patients receive effective and personalized care that meets or exceeds their expectations.

A comprehensive understanding of a patient's oral health status, risk factors, and treatment goals is essential for managing complex dental cases. Successful outcomes rely on the combined efforts of multiple dental specialties working together to address intricate challenges. This case report details the treatment of a 27-year-old male patient with a high risk of caries and multiple dental concerns, demonstrating the importance of interdisciplinary coordination in achieving long-term oral health and functional stability.

Materials and Methods

Case report

A 27-year-old man visited the dental clinic with concerns about persistent tooth pain, difficulty chewing, and dissatisfaction with his smile. A thorough clinical and radiographic assessment identified multiple decayed teeth, missing dentition, super-erupted molars, and inadequately performed root canal treatments (**Figures 1-3**). Despite having no significant medical history, the patient exhibited a high risk of caries due to poor oral hygiene habits.

Objectives

The final treatment approach followed the SBARD guidelines and included several phases. Key components involved: preventive care, assessment of tooth restorability, extraction of non-salvageable teeth, dietary evaluation, restoration of decayed teeth, endodontic treatment, and pre-prosthetic surgical procedures such as periodontal surgery and dental implant placement. Before the definitive prosthodontic treatment, an occlusal analysis was performed, followed by necessary adjustments to the occlusal plane.

Treatment objectives

1. Identify the essential elements involved in gathering records before providing optimal dental care.
2. Understand the critical diagnostic information that various radiographic perspectives offer.
3. Describe the six key treatment phases required to achieve optimal dental health for a patient.
4. Cultivate an understanding of the latest diagnostic tools and treatment techniques that assist in providing optimal dental care.

Treatment sequencing

Phase 1 – Preventive

- Treatment for periodontal issues
- Specialist consultations
- Creation of diagnostic casts and wax-up models
- Assessment of dental caries
- Caries management and evaluation of tooth restorability
- Dietary assessment
- Extraction of non-salvageable teeth #17, 26, 27, 36, 37, 48
- Temporary restorations to restore occlusion, function, speech, comfort, and aesthetics
- Use of removable orthodontic appliances

Phase 2 – Operative

Composite Restorations of teeth # 32, 43, 44,

Phase 3 – Endodontic

Non-Surgical Root Canal Therapy of teeth # 14, 13, 12, 11, 21, 23, 33, 45, 46

Phase 4 – Pre-Prosthodontic / Surgical

Cast post and core #24, 25, 45, 46

Fiber post and composite core #14, 13, 23, 33

Zirochomim post tooth # 12, 11, 21

Crown lengthening of teeth #12, 11, 21, 45, 46

Implant fixture area # 16, 26, 34, 35, 36

Phase 5 – Prosthodontic

IPS-Empress 3 unit-bridge of teeth # 21-23

IPS-Empress crowns for teeth # 13, 12, 11, 33

MCR (crown) of teeth # 16, 15, 14, 24, 25, 26, 36, 35, 34, 45, 46

Labial veneer for lower anterior #32-44

Phase 6 – Recall & Maintenance

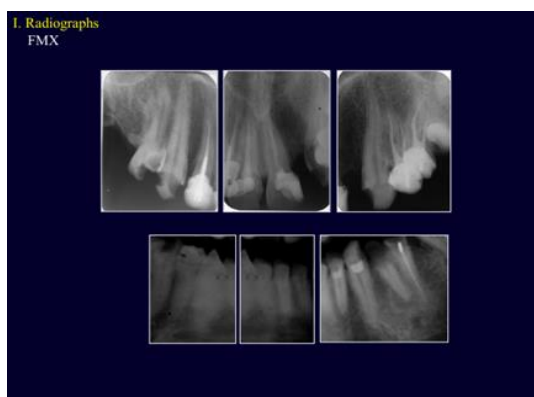


a)



b)

Figure 1. Pretreatment photographs



a)



b)

Figure 2. Pre-treatment radiographs



Figure 3. Post-treatment radiographs

Results and Discussion

The field of dentistry is continually evolving, and this special issue of *Medicine* focuses on the transformative innovations shaping oral health and clinical practice. It highlights a key trend toward a multidisciplinary, technology-driven approach, which integrates diverse areas such as restorative dentistry, oral surgery, prosthodontics, implantology, orthodontics, pediatric dentistry, and temporomandibular disorders [3].

In both dental and medical care, an interdisciplinary approach that combines the expertise of various disciplines is essential for delivering comprehensive treatment and optimizing results. With the rapid pace of scientific and technological advancements, it has become challenging for practitioners to keep up-to-date, making an integrated approach crucial in minimizing frustrations and improving patient outcomes. This report details the treatment process for a young patient with dental anxiety and significant oral health concerns [4].

For older adults, maintaining good oral health is vital for daily function, communication, and comfort. Dental issues such as periodontal disease, caries, and oral cancer can lead to pain, functional impairment, and diminished quality of life. Successful oral health outcomes often result from a collaborative approach involving healthcare providers, family members, and caregivers [2].

This case underscores the challenges of treating complex dental conditions that require the collaboration of multiple specialties. The patient faced generalized plaque-induced gingivitis, occlusal trauma, high susceptibility to caries, and several teeth that were non-vital and non-restorable, all of which required coordinated interdisciplinary care.

The gingival inflammation caused by plaque accumulation and poor oral hygiene was addressed through a combination of diligent oral hygiene practices, professional cleaning, root planing, and

ongoing periodontal care to reduce inflammation and restore periodontal health.

The occlusal trauma, resulting in discomfort during chewing and misalignment of the bite, called for a comprehensive treatment approach to stabilize the occlusion and prevent further damage to the teeth and surrounding tissues. This included interventions from prosthodontics, orthodontics, and periodontics. Treatment strategies likely involved occlusal analysis, bite adjustments, splint therapy, and orthodontic procedures to improve overall occlusal function and comfort.

The patient's elevated risk for caries called for a targeted preventive approach to reduce and manage this risk. This involved educating the patient about effective oral hygiene, dietary habits, fluoride use, and the importance of regular dental check-ups to detect and treat caries at an early stage. Restorative treatments were also carried out to repair existing carious lesions and prevent further decay [5].

The presence of multiple non-vital and non-restorable teeth complicated the treatment strategy. Possible solutions included revisiting root canal treatments, performing surgical endodontic procedures, or opting for extractions followed by prosthetic solutions. Achieving both functional and aesthetic restoration required joint efforts from endodontics, restorative dentistry, and prosthodontics.

The management of the patient's complex dental conditions required a collaborative approach across multiple dental specialties, including periodontics, endodontics, prosthodontics, orthodontics, and restorative dentistry. The combined expertise of the team facilitated a comprehensive and coordinated treatment plan addressing all aspects of the patient's oral health.

Before commencing treatment, it is essential to gather comprehensive information, including the patient's medical and dental history, clinical examination results, diagnostic models, and radiographic images. This data is fundamental for creating an effective treatment plan, as it provides a clear understanding of the patient's oral health, needs, and conditions. Radiographic imaging, such as panoramic, periapical, and CBCT scans, plays a vital role in diagnosing dental issues and planning appropriate treatment. These imaging techniques offer valuable insights into dental anatomy, pathology, and treatment outcomes, allowing clinicians to make informed decisions based on the strengths and limitations of each modality [6].

In the present case, the patient was likely diagnosed with a hypomature form of amelogenesis imperfecta (AI). The patient had already undergone extraction of

the right mandibular first molar. Although the patient was well-versed in proper oral hygiene, the initial visit revealed signs of gingivitis, suggesting inadequate oral care. The patient also mentioned that their sibling, aged 29 years, had a similar condition. Given the complexity of the case, an interdisciplinary approach was adopted. The treatment plan focused on improving aesthetics, restoring functional bite, and addressing reported sensitivity. To adjust the cervical line height, gingivectomy, and gingivoplasty were performed near the maxillary right central incisor, followed by two weeks of healing. To correct occlusion, resin composite restorations were placed on the mandibular left premolars, maxillary premolars, maxillary right first molar, and right first premolar. After a one-year follow-up, there were no signs of pathology or degradation in the restorations, and the patient's aesthetic and functional expectations were fully met.

The maxillary premolars and right maxillary first molar were restored with a resin composite material (Charisma A1, Heraeus Kulzer, Hanau, Germany) to improve their appearance. After the procedures, the patient's dental sensitivity completely resolved, and both aesthetics and function were effectively restored. The patient was monitored every three months for nine months. Throughout this time, no signs of deterioration were observed in the restorations. The patient maintained excellent oral hygiene, with no discoloration, visible cracks, or carious lesions present on the restored teeth [3].

"Oral rehabilitation" integrates various forms of dental care, blending artistic skill with scientific principles. This case highlights the importance of adopting an interdisciplinary team approach for comprehensive treatment planning, ensuring continuous care, and collaborative decision-making. Full-mouth rehabilitation presents a significant challenge for restorative dentistry practitioners, requiring precise diagnosis and detailed treatment strategies to achieve well-organized occlusal contacts and a balanced articulation. Such an approach optimizes both the function and aesthetics of the stomatognathic system, ultimately enhancing patient satisfaction and comfort. The collapse of posterior teeth, along with multiple decayed or missing teeth, can diminish the vertical dimension of occlusion and disrupt the normal occlusal plane [7].

Achieving optimal dental care requires keeping up with the latest diagnostic and treatment techniques. The use of advanced technologies such as digital radiography, CAD/CAM systems, intraoral scanners, and 3D printing enhances accuracy, patient comfort, and efficiency. By integrating these innovations, clinicians

can improve patient care, outcomes, and overall workflow.

This case report focuses on the full mouth rehabilitation of a 27-year-old patient, employing a structured approach to optimize diagnostic accuracy, treatment planning, and addressing both esthetic and functional needs in provisional restorations, which serve as the foundation for final restorative procedures. A strong understanding of interdisciplinary principles is essential for delivering both functional and esthetic results in full-mouth rehabilitation. With knowledge of these concepts, dental professionals can provide a wide array of treatment options tailored to each patient's unique age, expectations, and personality. In contemporary dentistry, every practitioner must understand how different dental disciplines collaborate to create an esthetic outcome while maintaining biological integrity and applying the most conservative treatment methods. Provisional restorations, which serve as the preliminary step in full mouth rehabilitation, should be carefully optimized, diagnostically managed, and resolved both esthetically and functionally.

The patient, a 27-year-old man in good health, sought treatment for decayed and missing teeth, pain while chewing, and a desire for improved smile and function. Upon clinical examination, issues such as malignancy, necrotic pulp, extensive decay, missing teeth, inadequate space for restorations, and widespread gingival irritation were identified. The vertical dimension of occlusion (VDO) was evaluated through mandibular jaw resting positions, facial measurements, and anatomical landmarks, revealing a reduced VDO and poor occlusion. Additionally, the freeway space was found to be greater than the typical 2-3 mm physiological space. Radiographic and clinical assessments confirmed the presence of generalized plaque-induced gingivitis, occlusal trauma, high caries risk, and several non-vital and non-restorable teeth. The process of record gathering was crucial to understanding the factors that contribute to optimal dental physiology. Multiple radiographic views provided valuable diagnostic information, and the six phases of treatment necessary to achieve optimal dental health were outlined.

The earlier study presents a case of hypoplastic rough-type amelogenesis imperfecta (AI) associated with various dental defects, along with details of the patient's prosthetic care. The primary concern for the 26-year-old female patient was tooth discoloration. Both clinical and radiographic evaluations confirmed the diagnosis of the rough hypoplastic form of AI. Treatment involved the placement of a full-mouth

porcelain-fused-to-metal fixed bridge. After closely monitoring the patient's temporomandibular joints and masticatory muscles for adaptation over the next four months, the patient demonstrated satisfactory tolerance to her new vertical dimension. Instructions on maintaining cleanliness in the interproximal and subpontic areas were provided, and two follow-up appointments were scheduled at 3 and 6 months. By the end of the follow-up period, no issues regarding function or aesthetics were reported [4].

The previous report also highlights the management of a young child facing severe dental challenges and dental anxiety. The latest advancements in medical technology, pharmacology, and dental techniques are underscored. The case exemplifies how interdisciplinary collaboration and communication between the dental team, the patient, and the guardians contribute to effective treatment. A noteworthy observation from a professional in an unrelated field significantly enhanced the patient's quality of life [8]. In the previous study, the child had undergone cardiac surgery at just ten days old and subsequently received additional procedures, including pacemaker placement and the installation of a porcine valve. During an assessment, the allergist identified a strong gag reflex and significant oral anxiety in the child, possibly linked to multiple major surgeries and heart conditions. Additionally, the child had been habitually sucking on sweets since the age of 10. Upon examining the oral cavity, the allergist noted severe dental decay. Although the patient was initially reluctant, the parents convinced the child to visit a dentist, and they referred him to one of the study's authors for evaluation [1].

The earlier article discusses a comprehensive approach to diagnosing and treating anterior dental aesthetics. The authors, specialists in periodontics, orthodontics, and treatment, have been part of an interdisciplinary research group focused on diverse dental issues for over two decades. In dental practices, a patient undergoing complex reconstruction is typically categorized as a type IV patient. This type of patient usually requires multiple visits spanning months or even years, depending on their needs for orthodontic, periodontic, endodontic, surgical, and restorative treatments. The dentist must adjust treatment fees to accommodate the time investment, increased appointments, and laboratory expenses. The study highlights that modern treatment planning in the multidisciplinary field of dentistry must prioritize clear aesthetic goals. By focusing on aesthetics first and then considering how the treatment will impact structure, function, and biology, the dentist can leverage various

dental specialties to provide optimal care for each patient [9].

Treatment outcome

Dental issues are frequently caused by multiple factors, and restorative treatments alone may not provide a complete solution. Achieving an ideal smile while maintaining oral health is a complex task that necessitates a collaborative, multidisciplinary approach and thorough planning. Special attention was given to occlusal adjustments in both the provisional and final restorations, as proper occlusal rehabilitation is critical for the long-term success of restorations and overall oral health. Crafting an aesthetically pleasing smile while ensuring functionality and health requires a comprehensive approach that goes beyond restorative treatments. This approach involves a combination of prosthodontics, periodontics, endodontics, orthodontics, and oral surgery. Dental practitioners must strategically plan treatments, taking into account the patient's unique needs, and contributing factors, and addressing both functional and aesthetic objectives. Adjustments to occlusion in both final and temporary restorations are vital for proper tooth alignment and function.

The long-term effectiveness of restorative procedures and overall oral health relies heavily on proper occlusal rehabilitation, which includes adjustments to the bite and occlusal surfaces. By fine-tuning the occlusion, clinicians can enhance the longevity and stability of restorations, while minimizing the risk of premature wear, fractures, and temporomandibular joint dysfunction.

For complex dental situations, a collaborative approach, thorough treatment planning, and occlusal rehabilitation are essential for achieving both aesthetic and functional goals. Dental professionals play a critical role in helping patients attain optimal oral health, a beautiful smile, and improved well-being by addressing the underlying causes of dental issues and delivering comprehensive treatment.

Conclusion

A challenging case often requires a team-based approach. However, providing the best treatment for the patient is only possible when there is strong communication and collaboration among all involved professionals. In this instance, the teamwork enabled the successful management of the patient's generalized plaque-induced gingivitis, high caries risk, occlusal trauma, and multiple non-vital and non-restorable teeth, ultimately restoring both oral function and health.

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