Case Report

# MULTIDISCIPLINARY COURSE OF ACTION IN TREATING AN INTRICATE DENTAL CONDITION: A CASE REPORT

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**Received:** 11 November 2024; **Revised:** 08 February 2025; **Accepted:** 10 February 2025 https://doi.org/10.51847/tMCyhI2l0C

**ABSTRACT**

Interdisciplinary teamwork and meticulous treatment planning are crucial for addressing complex dental disorders. Comprehensive management was essential following SBARD (SAUDI BOARD IN ADVANCE RESTORATIVE DENTISTRY) recommendations and treatment stages. Essential components include assessment of tooth restorability, preventive therapy, extraction of non-restorable teeth, dietary analysis, carious teeth restoration, endodontic treatment, and pre-prosthetic surgical care, which involves dental implant insertion and periodontal surgery. This case report details the treatment of a 27-year-old Saudi male patient exhibiting a high risk of caries, supra-erupted teeth, carious lesions, missing teeth, and inadequate root canal treatment. Principal treatments included preventative therapy, assessment of tooth restorability, extraction of hopeless tooth, extractions, dietary analysis, restorations, endodontic therapy, dental implants, and periodontal surgery. In the present case, the initial preventive measures included periodontal consultations, therapy, and diagnostic assessments, which laid a strong foundation for subsequent treatments. The hopeless teeth extraction (#17, 26, 27, 36, 37, 48) was critical in eliminating sources of infection and preparing the oral environment for restorative procedures. These extractions were pivotal in ensuring that the patient's oral health could be restored effectively without the complications posed by severely compromised teeth. Conclusive prosthodontic treatment was preceded by occlusal assessment and adjustment in treatment strategies in rehabilitating oral health, function, and aesthetics.

**Key words:** Dental physiology, Treatment planning, Case study, Complex dental cases, Interdisciplinary dentistry.

## Introduction

Dental professionals must provide the best current therapy, but circumstances can sometimes prevent this. Improper and misdiagnosis therapy can cause serious undesirable impacts, and errors are usual despite good destinations [1]. Understanding the concepts of interdisciplinary is crucial for functional and aesthetic restorations in full-mouth rehabilitation. Each patient's unique needs require a customized treatment plan.

Practitioners must understand how various dental disciplines work together to create conservative and biologically sound aesthetic makeovers [2]. The aim is to optimize treatment planning, and diagnostics, and address functional and aesthetic issues systematically, including making temporary renovations to guide the final restoration. Interdisciplinary collaboration and expertise enable precise full-mouth rehabilitation, meeting and exceeding patient expectations.

This case report studies the comprehensive treatment of a 27-year-old male patient with multiple dental problems and high caries risk.

## Materials and Methods

*Case report*

A 27-year-old medically healthy male presented with toothache, difficulty in mastication, and an unsatisfactory smile at the dental clinic. Radiographic and clinical assessments identified several missing teeth, carious lesions, poor oral hygiene, supra-erupted molars, and inadequate root canal treatment **(Figures 1-7)**.

*Objectives*

Comprehensive management was essential following SBARD (SAUDI BOARD IN ADVANCE RESTORATIVE DENTISTRY) recommendations and treatment stages. Essential components include assessment of tooth restorability, preventive therapy, extraction of non-restorable teeth, dietary analysis, carious teeth restoration, endodontic treatment, and pre-prosthetic surgical care, which involves dental implant insertion and periodontal surgery. Definitive prosthodontic treatment was preceded by occlusal plane adjustment and occlusal examination.

*Treatment objectives*

1. Identify the essential elements of record collection that precede the provision of optimum dental care for a patient.
2. Recognize the significant diagnostic contributions of various radiographic perspectives.
3. Elucidate the six stages of therapy required to achieve optimum oral physiology in a patient.

4. Cultivate an understanding of the cutting-edge diagnostic and therapeutic techniques accessible for achieving optimum oral health in patients.

*Treatment sequencing*
*Phase 1 – Preventive*
- Consultations
- Periodontal treatment
- Fabrication of diagnostic wax-up / diagnostic casts

- Caries assessment • Management of Caries and Tooth Restorability Evaluation
- Nutritional assessment
- Extraction of nonviable teeth #17, 26, 27, 36, 37, 48
- Temporization; functionality, restore occlusion, speech, comfort, and aesthetics.
  Orthodontic Animated Appliance

*Phase 2 – Operative*
*Composite Renovations of teeth # 32, 43, 44,*

*Phase 3 – Endodontic*
Non-Surgical Root Canal treatment of teeth # 14,13,12, 11,21, 23,33, 45, 46

*Phase 4 – Pre-Prosthodontic / Surgical*
Cast post and core for teeth #24, #25, #45, and #46 Fibre post and composite core numbers 14, 13, 23, 33 Placement of Zirochonim on teeth #12, 11, 21. Crown lengthening performed on teeth #12, 11, 21, 45, 46. Implant fixture locations #16, 26, 34, 35, 36.

*Phase 5 – Prosthodontics IPS-Empress three-unit bridge for teeth #21-23*
IPS-Empress crowns for teeth numbers 13, 12, 11, and 33; MCR crowns for teeth numbers 16, 15, 14, 24, 25, 26, 36, 35, 34, 45, and 46.
Labial veneer for lower anterior teeth #32-44

*Phase 6 –Maintenance & Recall*

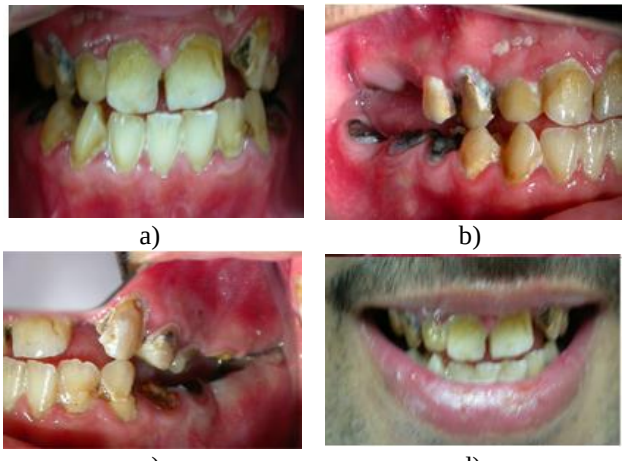

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**Figure 1.** Pre-treatment photographs

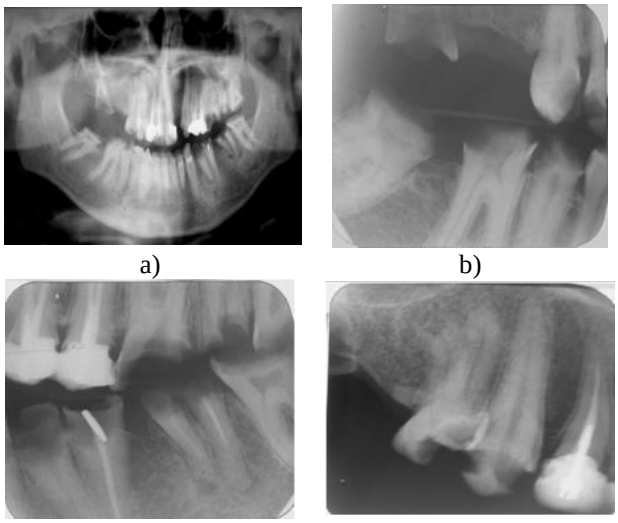

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**Figure 2.** Pre-treatment radiographs

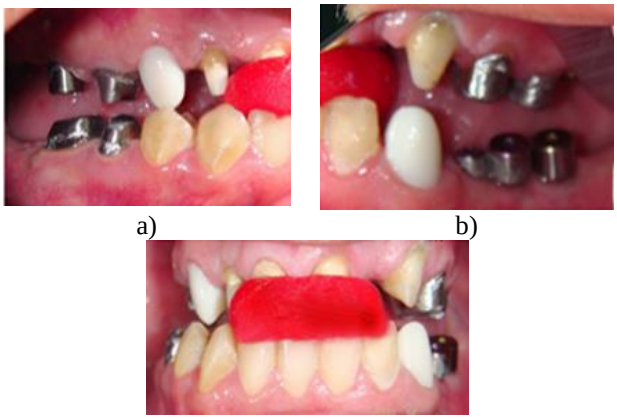
a) b)

**Figure 3.** Maxillary and mandibular preparations

a) b)

c) d)

**Figure 4.** Preparations (lateral profile) and try-in.



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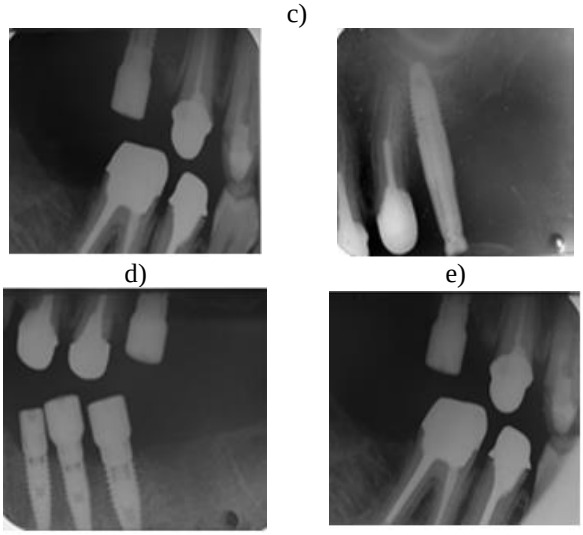
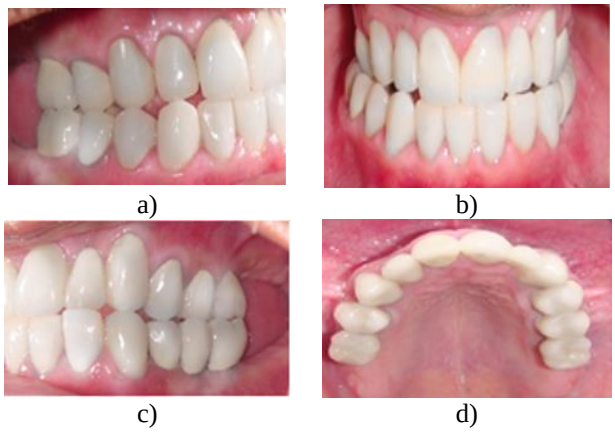


d) e) f) g)

**Figure 5.** Try In (Clinical view & Radiographs)



a) b) c) d)

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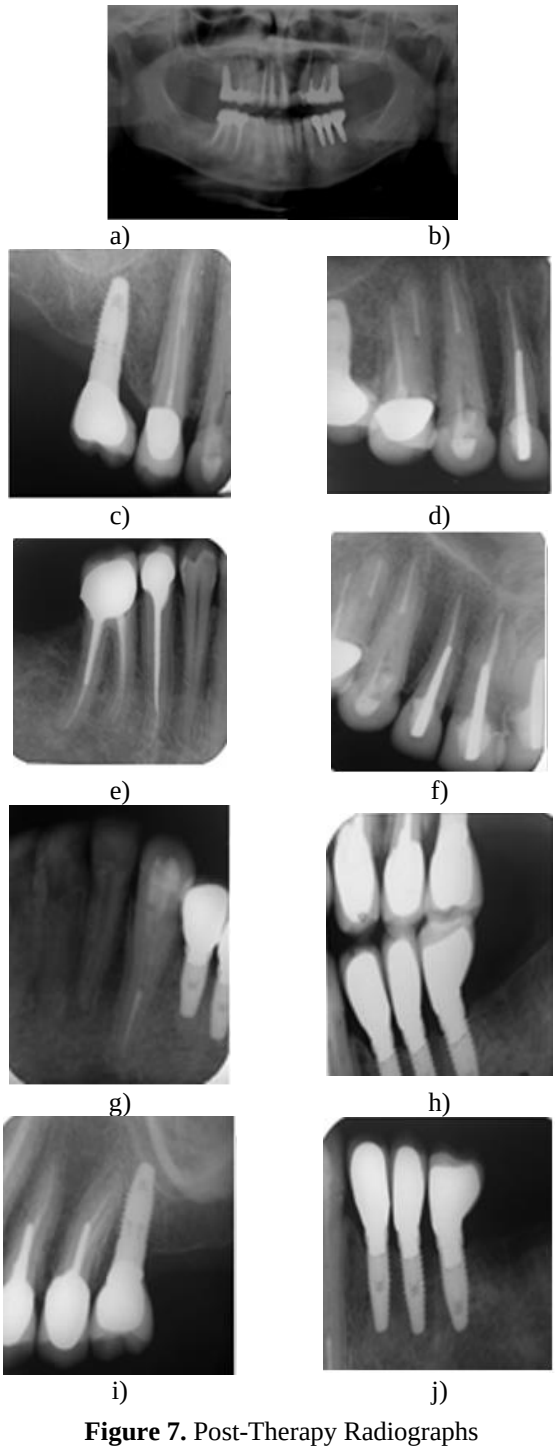
**Figure 6.** Post-Treatment Photographs



a) b) c) d) e) f) g) h) i) j)

**Figure 7.** Post-Therapy Radiographs

**Results and Discussion**

*Initial preventive measures and extractions*

In the present case, the initial preventive measures included periodontal consultations, therapy, and diagnostic assessments, which laid a strong foundation for subsequent treatments. The hopeless teeth extraction (#17, 26, 27, 36, 37, 48) was critical in eliminating sources of infection and preparing the oral environment for restorative procedures. These extractions were pivotal in ensuring that the patient's oral health could be restored effectively without the complications posed by severely compromised teeth.

Contrastingly, past studies have shown that orthodontic treatment of a healthy but reduced periodontium can be performed without adverse effects, provided that adequate supportive periodontal therapy (SPT) is maintained [3, 4]. This indicates that the necessity for extractions in the present case may have been due to the advanced stage of periodontal disease or other complicating factors that were not present in the cases referenced in past studies. Moreover, periodontal regeneration has been shown to effectively cure vertical bone deficiencies in teeth with a poor prognosis, suggesting that other treatment choices may have been viable based on the condition of the patient's periodontal structures [5].

*Temporization and provisional implants*

Temporization in the present case successfully restored occlusion, function, comfort, speech, and esthetics, which were crucial for the patient's interim quality of life. The use of temporary restorations provided an immediate improvement in the patient's oral functionality and appearance, significantly enhancing their overall well-being during the treatment process.

Similarly, past studies have indicated that provisional implants prevented the pre-described adverse effects on the maxillary anterior fixed temporary prosthesis and provided satisfactory and comfortable results during the period of post-extraction healing [6]. These findings underscore the importance of temporary solutions in maintaining patient comfort and functionality while permanent restorations are being prepared.

*Composite restorations*

In the current instance, the application of composite restorations on teeth #32, 43, and 44 effectively managed carious lesions and preserved dental structure, which is essential for the patient's confidence and satisfaction.

Previous research indicates that the elimination of caries rapidly enhances self-esteem and offers instant incentives via the improvement of aesthetics and dental health [7]. In contrast to ceramics and amalgam, composites allow for exclusively additive procedures, hence enhancing the preservation of tooth structure. The prognosis for the recovery of the residual tooth structure is often favourable when composite restorations fail [8]. Finite element calculations demonstrate that extensive dental cavities treated with composite exhibit superior biomechanical performance relative to amalgam, hence substantiating the preference for composite materials in restorative applications.

*Non-surgical root canal therapy*

Non-surgical root canal treatment on teeth #14, 13, 12, 11, 21, 23, 33, and 45 in the present case was pivotal in preserving teeth with necrotic and diseased pulp. This procedure alleviated pain, eradicated infection, and maintained tooth function, thereby reducing the need for extractions and enabling further restorative work.

In past studies, radiographs have shown that involved teeth with large periradicular lesions exhibit uniformly radiolucent and well-defined margins around the apices. Paduano *et al*. [9] concluded that orthodontic forces could be applied to teeth with cyst-like lesions before complete healing, provided the lesions were under endodontic treatment. Another case report documented that a periapical lesion healed completely two years after commencing orthodontic treatment before root canal therapy [10]. The study results show that, with proper management, endodontic and orthodontic treatments have been integrated effectively, promoting comprehensive dental health and restoration [11, 12].

*Restoration with fiber and zirconium posts*

Fibre posts and composite cores were evaluated for teeth #14, #13, and #23 in this case. This combination demonstrated adequacy in terms of strength and had a more esthetic appearance than metal posts.

Likewise, for other teeth, only zirconium posts were chosen for their excellent aesthetic characteristics and very satisfactory biocompatibility as well as highest mechanical strength when serving as anchorage posts for further crowns.

According to current research, fibre posts and direct resin composites are the best ways to manage endodontically treated teeth since they preserve the residual tooth structure and also increase patient compliance [13]. Furthermore, zirconia posts have improved the cuspal aesthetics of all-ceramic crowns; these case reports demonstrate clinical success, which is consistent with the high success rates that have been documented throughout time [14-16].

*Crown lengthening and occlusal adjustments*

Crown lengthening techniques were used in this instance to improve the final prosthesis' aesthetics and retention. Because the exposed length was extended, this process made sure the crowns were securely positioned and that the teeth were properly fitted and covered.

According to earlier research, crown lengthening improves gingival sulcus bleeding, increases patient satisfaction and aesthetics, and improves the periodontal health and degree of dysfunction in patients who have lost maxillary anterior teeth [17]. The present case showed improved meticulous treatment planning and occlusal settings in both final and temporary restorations. Occlusal rehabilitation is vital to the long-term achievement of restorations and overall oral health, necessitating a multidisciplinary approach for complex cases [17].

*Interdisciplinary treatment approach*

The current instance serves as an example of the need to treat both small and big dental issues holistically. Effective solutions that addressed function and aesthetics were identified via the use of an interdisciplinary approach that included period-inflammatory, orthodontic, endodontic, and restorative therapy.

Increased professional cooperation has also been shown to improve a patient's physical and emotional wellbeing, according to previous studies [1, 12, 18, 19]. The effectiveness of such therapies depends on professional collaboration, integrated interprofessional care, and a patient-centered, yet evidence-based, therapeutic strategy.

## Conclusion

In summary, the present case report underscores the importance of a multidisciplinary approach, meticulous planning, and the use of advanced materials and techniques in dental restorations. The initial preventive measures, extractions, temporization, composite restorations, non-surgical root canal treatment, and the utilization of fiber and zirconium posts collectively contributed to the successful restoration of the patient's oral health. These interventions not only addressed the immediate functional and esthetic concerns but also laid the groundwork for long-term oral health and patient satisfaction.

Comparatively, past studies provide valuable insights into the effectiveness of various dental treatments and materials, emphasizing the importance of supportive periodontal therapy the benefits of provisional implants, the advantages of composite materials, and the successful integration of endodontic and orthodontic treatments. The findings from both past and present studies highlight the evolving nature of dental practice, where evidence-based approaches and interdisciplinary collaboration are key to achieving optimal patient outcomes.

**Acknowledgments:** We would like to acknowledge the research center of PSMMC.

**Conflict of interest:** None

**Financial support:** None

**Ethics statement:** This study has received an ethical approval with code PSMMC/2024/1978.

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