



Case Report: A Multi-Disciplinary Prosthodontic Rehabilitation of a Partially Edentulous Maxillary Arch.

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ABSTRACT:

Prosthodontic rehabilitation plays a crucial role in restoring oral function, aesthetics, and comfort in patients with partial edentulous and loss of vertical dimension. Implant-supported prostheses provide an effective long-term solution for such cases. This case report presents the prosthodontic rehabilitation of a 50-year-old female patient with a partially edentulous maxillary arch and loss of vertical dimension, resulting in difficulty chewing. A comprehensive treatment plan included extractions, root canal therapy, post and core restorations, and implant placement in regions 16, 23, 24, and 26. The treatment successfully restored function, aesthetics, and occlusal stability, with the patient adapting well to the new vertical dimension. This case highlights the importance of a multidisciplinary approach in achieving optimal long-term outcomes in prosthodontic rehabilitation.

1. Introduction

Full-mouth rehabilitation involves a comprehensive approach that integrates diagnostic, therapeutic, and restorative procedures to replace lost oral structures. It requires careful prosthodontic considerations, including the analysis of the existing occlusion and occlusal plane, evaluation of available freeway space, assessment of edentulous areas, and the number, position, and condition of remaining teeth in each arch. Additionally, it involves determining the need for vertical dimension adjustments and restoring both function and esthetics [1-3].

The goal of full-mouth rehabilitation is to transform unfavourable forces acting on the teeth—which can lead to pathological conditions—into favourable forces that promote normal function and oral health [4].

This clinical report presents the esthetic and functional rehabilitation of a patient with vertical loss due to

multiple missing teeth. A comprehensive oral rehabilitation was successfully achieved by integrating fixed prosthodontic principles and dental implants.

CASE REPORT:

A 50-year-old female patient reported to the Department of Prosthodontics with a chief complaint of difficulty in chewing food due to multiple missing teeth for the past year. The patient expressed concerns about compromised function and aesthetics. On extra-oral examination, no signs of deviation or clicking sounds were observed in the temporomandibular joint (TMJ). The facial profile and symmetry appeared normal, with no apparent muscle tenderness or parafunctional habits. And on intraoral Examination, the patient had an existing bridge extending from tooth 22 to 27. The missing teeth included 24, 25, 26, and 16. Teeth 14 and 15 were root canal treated. Generalized attrition was noted, suggesting a possible loss of vertical dimension [fig.1].



FIGURE1: Pre-operative photographs

Based on these findings, the patient was diagnosed with a partially edentulous maxillary arch with a loss of vertical dimension. The patient was informed about the necessary extractions, root canal therapy, and teeth replacement options, including fixed and implant-supported prostheses. A periapical radiograph and panoramic radiograph were taken to assess bone levels, root integrity, and periapical pathologies. Tooth 22 showed evidence of a periapical abscess. The patient was advised to undergo root canal therapy for teeth 21, 22, 23, 11, 12, and 13 [fig.2]. Tooth 23 presented as a weeping canal, making endodontic treatment unfavourable, and was thus advised for extraction.



FIGURE 2: Pre-operative radiograph

Treatment Plan:

1. Extraction of non-restorable tooth 23.
2. Root canal therapy for teeth 21, 22, 11, 12, and 13.
3. Post and core restorations for teeth 14 and 15.
4. Removal of the existing bridge.
5. Implant placement in positions 16, 23, 24, and 26.
6. Prosthetic rehabilitation with implant-supported prostheses and fixed dental restorations.
7. Adjustment of vertical dimension with occlusal splints.

Phase 1: Preliminary Procedures

The existing bridge was removed,[fig.3] and a preliminary impression was made using irreversible hydrocolloid. The impressions were used to fabricate diagnostic casts. Maxillary casts were mounted on a semi-adjustable articulator using a facebow transfer to analyze occlusion and vertical dimension [fig.4].





FIGURE 3: Existing bridge was removed with relation to 22-27

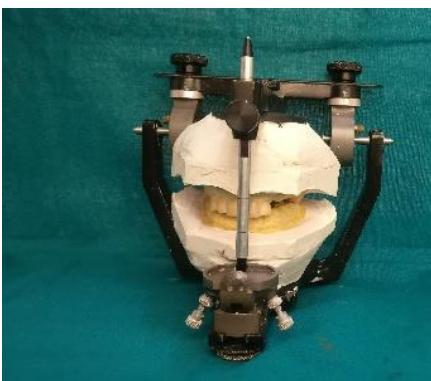


FIGURE 4: Facebow transfer and mounting of the diagnostic casts in a semi-adjustable articulator

Phase 2: Surgical Procedures

Implant placement was planned and executed for teeth 16, 23, 24, and 26. The implant dimensions used included two implants of size 5 × 8 mm and two implants of size 4 × 12 mm [fig.5]. Standard implant placement protocol was followed, ensuring primary stability and optimal positioning [fig.6]. After implant placement, the surgical sites were sutured, and the patient was given

postoperative instructions and medications. A healing period of three months was allowed for osseointegration.

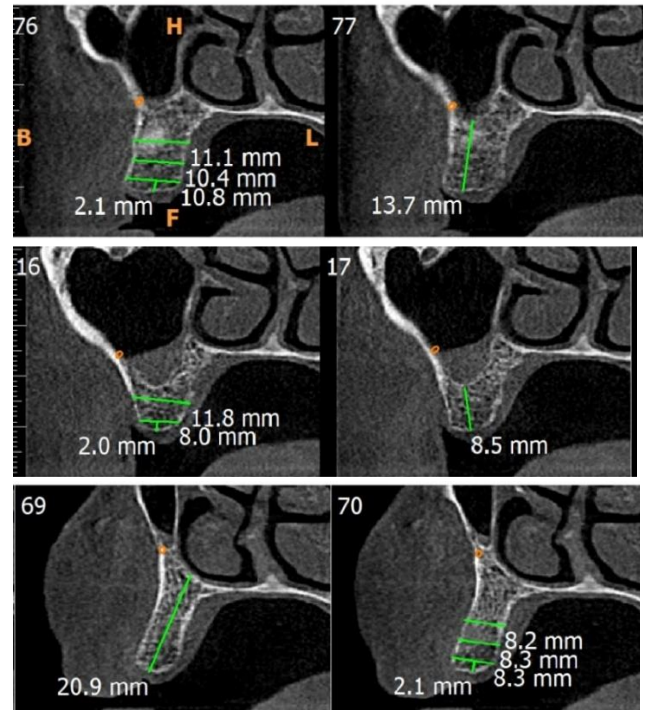


Figure 5: implant planning for 16,26,23



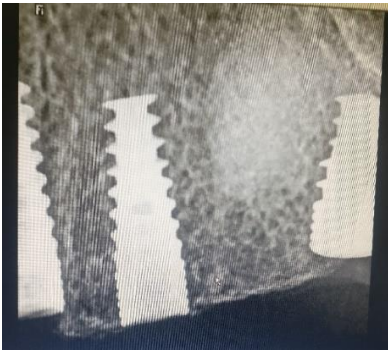


Figure 6: implants placed surgically

Phase 3: Osseointegration and Vertical Dimension Adjustment

After three months, the patient was recalled for a follow-up visit. Clinical and radiographic assessments confirmed successful osseointegration. Second-stage surgery was performed to expose the implants and place healing abutments [fig.7]. To correct the loss of vertical dimension, a 1mm increase was introduced using occlusal splints on the lower arch [fig.8]. The patient was monitored for adaptation to the new vertical dimension before proceeding with definitive prosthetic work.

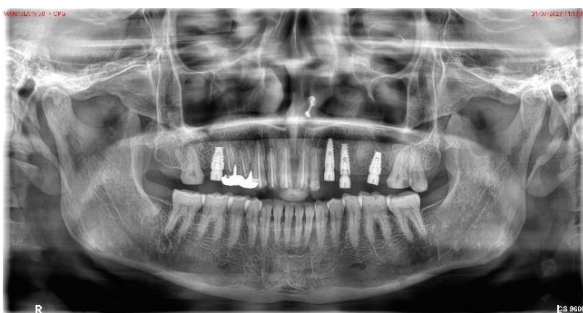


Figure 7: second stage surgery was done and healing abutments were placed



Figure 8: splint given to increase vertical dimension

Phase 4: Prosthetic Phase Post and Core Restoration: Tooth preparations were completed for 14 and 15. Cast post and core restorations were fabricated and cemented in teeth 14 and 15 [fig.9].



Figure 9: cast post fabrication

Implant Prosthetic Procedures: Implant-level impressions were made using polyvinyl siloxane impression material [fig.10]. A verification jig trial was conducted to confirm passive fit [Fig.11]. The metal framework was tried in, ensuring accurate fit and stability. Final prosthesis fabrication was completed, with occlusal adjustments made to harmonize function and aesthetics [Fig.12].



Figure 10: Implant level impression made with elastomers



Figure 11: Jig trail verified



Figure 12: Metal try in and bisque trail verified.

Final Prosthesis Insertion: Before final cementation, occlusion was carefully evaluated and adjusted to avoid premature contacts. The marginal fit of the prosthesis was assessed to ensure precision, and the shade was confirmed to match the patient's natural dentition. The final prosthesis was cemented using a biocompatible luting agent [fig.13]. Post-operative instructions were given to the patient.



Figure 13: final prosthesis insertion done

DISCUSSION:

When occlusal deterioration begins to impact a person's esthetics and function, timely intervention is essential. The primary therapeutic goal is to restore and maintain the health, function, and esthetics of the stomatognathic system, which is responsible for chewing, speaking, and swallowing. Full-mouth rehabilitation (FMR) is necessary to create a smile that is both esthetically





pleasing and functionally comfortable [5-7]. Successfully restoring a patient to a state of physiological health requires not only accurate diagnosis but also comprehensive knowledge of various treatment modalities [8].

A thorough examination and diagnosis are crucial for systematic treatment planning. Restorative procedures should not commence without a clear visualization of the expected outcome. A multidisciplinary approach is often required, involving collaboration between periodontists, endodontists, oral surgeons, and orthodontists [9]. Effective communication among specialists is key to achieving a harmonious and functional stomatognathic system. Depending on the patient's condition, all relevant dental disciplines should be integrated into the treatment plan, ensuring a holistic and responsible approach to full-mouth rehabilitation. Limitations include that use of digital technologies would help in better precise fit and accuracy. A long term followup is also needed [10].

In this case report, will discuss a multidisciplinary full mouth reconstruction case involving root canal procedure, post and core restorations, crowns, splinted crowns, bridges and implant supported fixed prosthesis. By the end of the article, the reader should be well aware of the restorative outcome of the treatment both functionally and aesthetically.

CONCLUSION:

This case demonstrates a successful prosthodontic rehabilitation of a partially edentulous maxillary arch with the restoration of lost vertical dimension. The integration of endodontic therapy, post and core restorations, and implant-supported prostheses provided the patient with a stable, functional, and aesthetically pleasing outcome. A multidisciplinary approach played a crucial role in ensuring long-term success and patient satisfaction.

CONSENT WRITTEN:

Informed consent was obtained from the patient for the publication of this case report and accompanying images.

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CONFLICTS OF INTERESTS: There are no conflicts of interests.

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