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PROSTHETIC MANAGEMENT FOR SIEBERT CLASS III RESIDUAL RIDGE DEFORMITY USING A FIXED-REMOVABLE HYBRID PROSTHESIS: A CASE REPORT.

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Abstract:

Rehabilitation of anterior ridge defects poses significant challenges due to associated loss of hard and soft tissues, impacting esthetics, phonetics, function, and hygiene. Conventional fixed or removable prostheses often fail to address these multifactorial demands. The fixed-removable prosthesis, exemplified by the Andrews Bridge system, offers a practical alternative by combining the stability of a fixed framework with the adaptability of a removable segment. This clinical report describes the management of a patient with a Siebert Class III anterior maxillary ridge defect using the Andrews Bridge philosophy. The prosthesis included fixed retainers connected by a bar and a removable acrylic segment retained via a sleeve attachment. This design allowed for optimal esthetics, phonetics, improved oral hygiene, and favorable force distribution. The Andrews Bridge system proved to be an effective, conservative, and versatile solution for complex anterior defects where conventional prostheses may be inadequate.

Key words: andrews bridge, fixed-removable prosthesis, bar and sleeve attachment, esthetics.

Introduction

Tooth loss due to caries, periodontitis, trauma, or surgery often leads to alveolar ridge resorption, compromising esthetics, speech, and function. Traditional treatment includes surgical augmentation or prosthetic rehabilitation.[1] However, surgical options may be unpredictable or costly in severe resorption cases. Prosthodontic alternatives like fixed partial dentures, implant-supported prostheses, and fixed-removable systems are considered based on individual needs. The fixed-removable system, such as the Andrews Bridge introduced by Dr. James Andrews, combines fixed retainers with a removable pontic segment, offering both esthetic results and ease of hygiene maintenance in ridge defect cases.[2]

Clinical Report

A 49-year-old female patient presented to the Department of Prosthodontics with the chief complaint of missing lower front teeth and

dissatisfaction with her smile. She had previously worn a removable partial denture replacing teeth from right lateral incisor to left lateral incisor which was discontinued due to discomfort and poor retention. The patient strongly preferred a fixed solution but declined surgical and implant therapy due to financial constraints.

Clinical Examination and Diagnosis

Intraoral examination revealed a partially edentulous mandibular anterior region (right lateral incisor to left lateral incisor) with moderate ridge resorption. An existing fixed prosthesis was noted in the maxillary anterior region (right lateral incisor to left lateral incisor). An orthopantomograph (OPG) confirmed a Siebert Class III ridge defect in the lower anterior arch. Right and left mandibular canines evaluated as suitable abutments.

Treatment Plan

Considering the patient's esthetic demand, hygiene concerns, and reluctance for surgical interventions, a fixed-removable prosthesis following the Andrews Bridge design was selected. This included porcelain-fused-to-metal (PFM) retainers on right canine and left canine connected by a bar, and a removable acrylic pontic segment replacing the four missing anterior teeth.

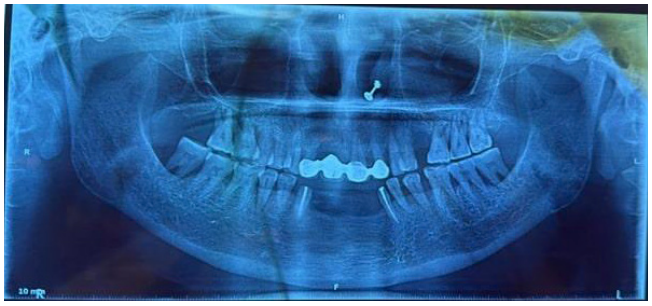

Figure 1: Intentional Root Canal Treatment i.r.t 33 and 43

Clinical Procedure

Intentional root canal treatment was performed on teeth right canine and left canine [Figure 1]. Tooth preparation was done to receive PFM crowns. A diagnostic impression was made to facilitate bar alignment and wax-up. Final impressions were recorded using the double-mix single-step technique with polyvinyl siloxane (3M ESPE Express, India).

Master casts were poured using Type IV dental stone (Neelkanth,India)and articulated. Wax patterns for the retainers were fabricated, and a prefabricated castable plastic bar (Bredent, UK) was incorporated parallel to the ridge [Figure 2]. A space of 2–3 mm was maintained between the bar and residual ridge to ensure hygiene access.[3]

The entire metal framework was cast using cobalt-chromium alloy (Wirobond C, Sweden), and a metal try-in was conducted. Shade selection was done using the VITA shade guide. A wax-up of the missing anterior teeth was prepared and evaluated intraorally for esthetics and phonetics. The ceramic build-up of the PFM bridge was completed, and the fixed component was cemented with glass ionomer luting cement (3M Ketac, India) [Figure 3].

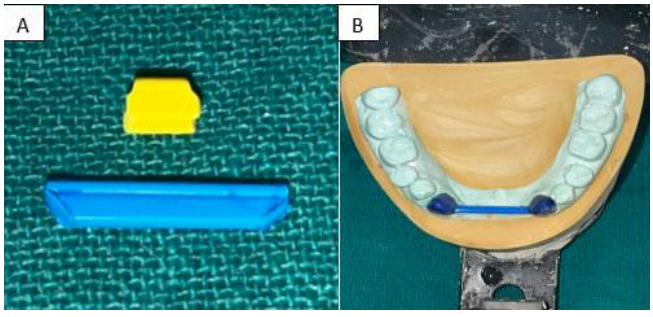

Figure 2: A. Prefabricated Castable Plastic Bar (Bredent,Uk) B, Wax Up of Bar Attachment and Coping 33, 43.

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The removable acrylic segment was processed using heat-cure resin (DPI, India). The undercut beneath the bar was blocked out, and a clip was picked up into the denture using self-cure acrylic resin. The final prosthesis was polished and delivered after evaluating esthetics, phonetics, retention, and comfort [Figure 4].

The patient was instructed on insertion and removal of the prosthesis and advised to use an interdental brush for cleaning beneath the bar.[4] Oral hygiene instructions were reinforced, and the importance of regular follow-up was emphasized to monitor tissue health and prosthesis integrity.[1]

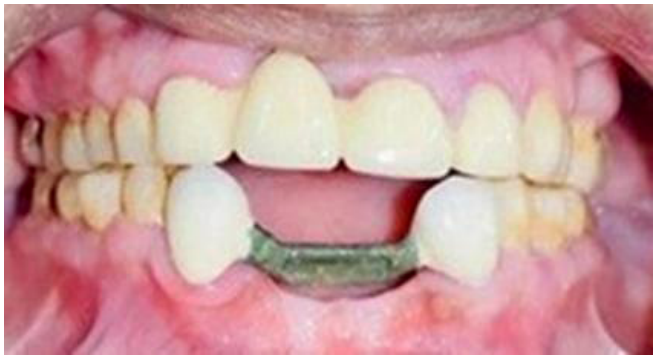

Figure 3: Cementation Of Porcelain Fused to Metal Fixed Partial Denture and Fixed Component of Andrew's Bridge

Discussion

Ridge defects following tooth loss can be classified according to Siebert's classification.[5] A Class III defect, characterized by combined horizontal and vertical bone loss, presents significant challenges for prosthetic rehabilitation. These defects compromise esthetics, phonetics, and function, especially in the anterior region.[6]

Traditional fixed prostheses may appear elongated or esthetically unpleasing in such cases. Removable prostheses, while compensating for tissue loss, may lack retention or patient acceptance. The Andrews Bridge system bridges this gap by combining a fixed splint with a removable pontic segment, making it suitable for localized defects.[7]

This approach is particularly advantageous in cases where:[8]

- Ridge augmentation is declined or contraindicated.
- Implant placement is not feasible.
- Soft tissue esthetics must be optimized.
- Oral hygiene needs to be maintained effectively.

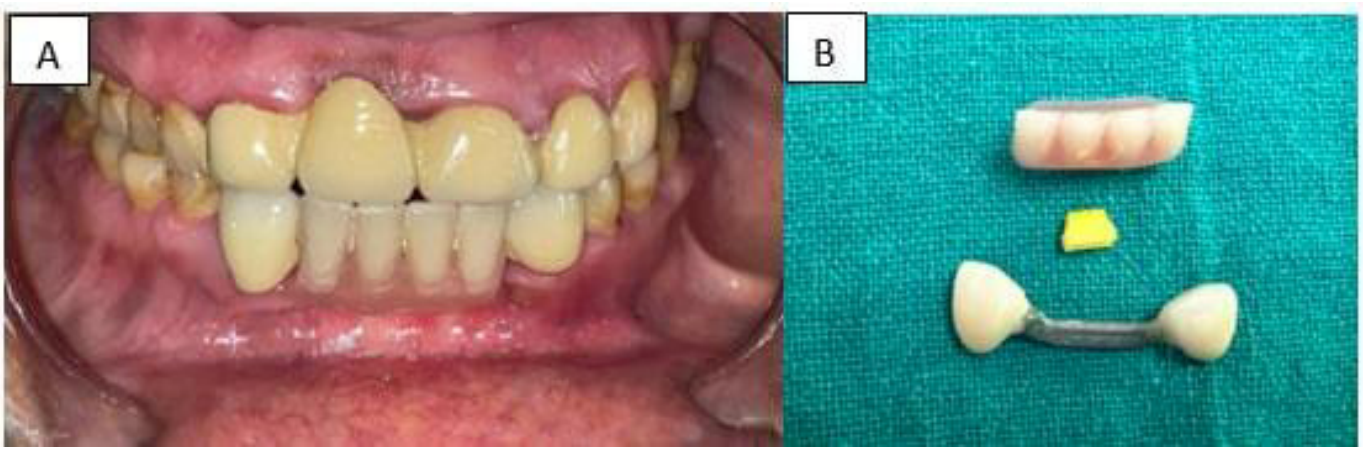

Figure 4: Post-Operative Occlusal View: Andrew's Bridge replacing 31,32,41,42 using bar and sleeve attachment, B. Component of Andrews Bridge

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The removable segment allows for easy maintenance and future relining if soft tissue changes occur. It improves esthetics by enabling customization of pontic contour and flange extension, which enhances lip support and speech. Additionally, occlusal forces are directed favorably along the long axis of the abutments, improving biomechanical stability.[7]

Common failures of the system are mechanical in nature, often due to inadequate soldering or improper clip fit. These can be mitigated by using single casting techniques and quality attachment systems.

In this case, the patient benefited from all the advantages of the system—enhanced esthetics, phonetics, functional efficiency, and ease of maintenance. The prosthesis restored her smile, improved confidence, and met her expectations without the need for surgical interventions.[8]

Conclusion

The Andrews bridge system is an efficient fixed-removable prosthetic solution for managing localized anterior ridge defects, especially in patients unwilling or unsuitable for implant or surgical options. It successfully restores esthetics, speech, and function while allowing for excellent hygiene maintenance. With proper case selection, careful fabrication, and patient education, it offers long-term clinical success and high patient satisfaction.

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