



Andrew's Bridge as a invasive treatment modality for missing anterior teeth with severe ridge deformity: A case report

Sneha Joseph¹, Nighila Ravindran¹, Aswani Surya¹, Sankar Madhavan²

¹Post graduate, Department of Prosthodontics and Crown & Bridge, Sree Anjaneya Institute Of Dental Sciences

²Professor and Head, Department of Prosthodontics and Crown & Bridge, Sree Anjaneya Institute Of Dental Sciences

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ABSTRACT: This research report presents a case study of the Andrew's bridge system used on a patient who had a class III ridge deformity and missing teeth in the mandibular and anterior maxillary aesthetic regions. Because of the size of the edentulous span and the periodontal state of the abutment teeth, treatment with a fixed partial denture (FPD) may not be possible in certain situations. If the fixed-removable Andrew's bridge system is properly diagnosed and carefully planned, it offers a favorable prognosis.

KEYWORDS: Missing teeth, Ridge defect, Siebert's classification, Andrew's bridge, esthetics, function, abutment, fixed-removable prosthesis, metal bar, porcelain fused metal crowns.

I. INTRODUCTION

Function and aesthetics are crucial considerations while creating a treatment plan. Adjacent soft and hard tissue frequently loses varying amounts when teeth are lost. For the replacement of missing teeth, numerous treatment modalities have been selected. The deformity can be effectively restored with fixed partial dentures, implant-supported prosthetics, or removable prosthetics. Rehabilitating a large anterior ridge defect with prosthodontics can be difficult. To achieve proper speech and aesthetics, such defects necessitate not only the replacement of missing teeth but also the closure of the affected area. A favorable treatment option is the Andrews Bridge, which combines a fixed prosthesis with a removable one.¹

Dr. James Andrews of Amite, Louisiana, USA, invented the fixed-removable partial denture system in 1965. This type of denture is especially recommended for patients who have lost a significant amount of supportive tissue and when the replacement teeth's esthetic arch position or opposing arches' alignment make it difficult to place a traditional fixed partial denture. Patients with large ridge defects may benefit from the fixed-

removable prosthesis known as Andrews Bridge. The fixed-removable Andrews bridge system indicators are Several missing teeth combined with an edentulous ridge defect, Failure of a removable partial denture due to palatal extension-related discomfort Patients with cleft palates in a long edentulous space where fixed partial dentures have failed.³

Speech and appearance are restored when this prosthesis effectively closes the entire defect and replaces lost teeth. This system combines detachable pontics with a fixed component on the abutment teeth. The fixed component consists of metal crowns fused to porcelain, which are connected by a casted bar affixed to the ready-made abutments. The detachable element comprises acrylic teeth set on an acrylic foundation, into which plastic or metal sleeve tracts are inserted. This method offers the benefit of improved stability and retention as well as flexibility in positioning the removable partial denture teeth with the least amount of extension.² The purpose of this article is to describe a patient who had a ridge defect and multiple anterior teeth. The patient was treated with an Andrew's Bridge to restore function, aesthetics, and comfort while also creating a favorable stress distribution for the abutments and soft tissue.⁴

II. CASE REPORT

Case history: A 36-year-old man with tooth loss in his maxillary and mandibular anterior regions for the previous six months presented to the prosthodontics department primarily complaining of poor esthetics. The patient related how, approximately three months ago, he suffered an inadvertent fall that resulted in the immediate loss of several teeth. Few teeth were lost over time as a result of the increased mobility. According to his dental history, he had an extraction one month earlier. The patient's medical history held no significance. (Figure 1)



During an intraoral examination, missing 11, 12, 21, 22, 31, 32, 41, and 42 were found, and the patient's significant alveolar defect was classified as a class III defect by WICAL AND SWOOPE and SIEBERTS classification. This defect manifested as a thin knife-edge residual ridge along with vertical height loss (Figure 2) .



Figure 1 : Pre-OP Extra-Oral (Front View)



Figure 2 :Pre -OP intraoral view

A radiographic examination of the maxillary and mandibular central incisors and lateral incisors showed severe bone loss. (Figure 3) . The patient received treatment recommendations after a comprehensive evaluation, which included fixed removable partial dentures, fixed removable prostheses, and prostheses supported by implants.



Figure 3 : Orthopantomogram

III . TREATMENT

Following the completion of the clinical history and radiographic evaluation, the patient was informed of the length of treatment, the required number of appointments, prosthesis maintenance, the significance of maintaining good oral hygiene, and the benefits and drawbacks of Andrew's bridge prosthesis. Beginning of treatment Treatment for periodontal disease involved complete oral prophylaxis and a maintenance regimen. Upper and lower Irreversible hydrocolloid (Tropicalgin Zhermack, Germany) was used to create diagnostic impressions, and Type IV Dental Stone (Kalrock, Kalabhai, Mumbai) was used to pour it. To replicate the prosthesis that was used for provisionalization, a diagnostic wax up was completed.

The chosen abutment teeth were ready to receive metal ceramic crowns after two weeks. The teeth of the right and left canines were prepared by chamfering the finish line palatally and placing the shoulder finish line buccally using diamond burs (Mani, India). (Figure 4) . A 000 retraction cord was used for gingival retraction (Ultrapack, Ultradent products Inc.). The putty wash impression technique was utilized to create impressions. Temporary cementation of provisionals (Luxatemp, DMG, Germany) was done .



Figure 4: Tooth preparation



The dental stone (Type IV die stone, Gyproc, India) was filled with master casts. Using Inlay Casting Wax (Renfert, Germany), wax patterns were created on the prepared abutment teeth and the bar was fabricated in the wax pattern casted along with copings. (Figure 5). The polished and finished metal framework was tested in the patient's mouth to ensure that there was enough room for the bar attachment to fit properly and for the soft tissues underneath.



Figure 5 : Wax up

Occlusion rim was constructed over the edentulous area, teeth arrangement and trial of the missing teeth was done for patient's approval. (Figure 6). Then, using heat-cured polymethylmethacrylate (PMMA) resin (Dental Products of India DPI, Mumbai), the detachable portion of Andrew's bridge was constructed. Prior to the packing of acrylic resin, a plastic clip and metal housing (Life Care Devices, Mumbai—Product Code -99531060, 10) were placed on the cast. After ceramic veneer was applied to the metal copings, the restoration was polished and completed. (Figure 7)



Figure 6 : Try- in



Figure. 7: Tissue surface of prosthesis

The fixed component was cemented onto the prepared abutment tooth. (Figure 8). After an hour, a removable component was placed and occlusal adjustments were made. (Figure 9). The patient was advised to maintain the prosthesis and underlying tissue in the same way as with a removable denture, which involved removing the prosthesis and soaking it in a disinfectant solution for the night. Every six months, the patient was maintained on a regular follow-up regimen. The results of the prosthetic pleased the patient.



Figure 8: Fixed components cemented



Figure 9 : Intraoral view



Figure 10 : Postoperative view

IV . DISCUSSION

Large anterior ridge flaws require prosthodontic therapy that addresses the soft and hard tissue defects, phonetics, and esthetics. The dentist may encounter difficult situations as a result of this disease. The term "localized alveolar ridge defect" describes a restricted volumetric shortfall of both soft and hard tissue in the alveolar process. Rehabilitation with removable partial dentures is a typical procedure for numerous lost teeth with severe bone loss. Compared to fixed prostheses, removable prostheses are less stable, less retentive, and less comfortable—particularly in cases with Seibert's class III ridge deformity, where the prosthesis's height and width are insufficient.⁶

In a short span edentulous clinical scenario with significantly lacking ridges, implant-supported fpds, fixed-RPD, conventional FPD, and RPD are the prosthetic therapy alternatives. Several aesthetic issues, such as loss of papillae, formation of "black" interdental gaps, poor phonetics, food accumulation under the pontic, and loss of buccal contour, are associated with the restoration of a localized alveolar ridge defect with a fixed prosthesis.⁴

The surgical repair of the deficiencies with iliac crest grafts (with or without growth factor) and implant insertion was a costly and time-consuming process. According to some writers, alloplast grafts combined with collagen membranes work well for cleft alveoli. The patient's cooperation and consent are also necessary for surgical repair. When traditional fixed or removable prostheses are impractical, a third Andrew's bridge treatment option may be effective in improving

speech, function, appearance, and loss of the deformity.⁵

When multiple teeth are missing, it needs to be restored coupled with compromised arches resulting from Seibert's class III ridge defect, Andrew's bridge system will make it easier to preserve function, hygiene, and appearance. As opposed to FPD, replacement with an acrylic denture flange for tissue abnormalities has the extra benefit of not requiring a separate prosthesis for gingival rehabilitation. This kind of prosthesis causes the least amount of damage to the soft tissues and offers a similar level of snugness between the non-removable and removable parts it includes. The Andrew's system is typically categorized into two groups according to where the bar is attached. These are the Pontic supported Andrew's bar system and the Bone anchored or implant supported Andrew's bar system.⁷

In this scenario, traditional removable or fixed dental prosthesis was not a viable choice. Andrew's Bridge could be effective in bringing back functionality, appearance, speech, and sealing the gap. The benefits of the Andrew's bridge system are thoroughly covered in the research, which highlights improved appearance, cleanliness, and flexibility, in addition to better speech. It offers comfort and cost-effectiveness for patients. Unlike removable partial dentures, it does not cause palatal extension. There's a positive reaction of the soft tissues due to reduced soft tissue compression. This prosthesis is more secure and stable, with minimal movement. It prevents the transfer of undesirable leverage forces to the abutment teeth by serving as a buffer.²

Potential drawbacks of this device include the deterioration of retention sleeves, which can result in instability and the loss of the device's grip, the need for frequent repairs and relining, and the inconvenience of having to clean the removable part regularly, which can be challenging for some patients. Research indicates only a few instances of this method failing. The most common cause of failure was due to issues with the casting. However, this problem was solved by securing retainers to the bar during a single casting. The patient was satisfied with the end result, achieving both good aesthetics and speech.⁶

V . CONCLUSION

The removable nature of Andrews' bridge treatment in the pontic area makes it simple to maintain, while also providing support to the abutment and helping the prosthesis to stay in place. This option offers the best appearance and sound quality for situations where there is



significant loss of supporting tissue, jaw defects, or challenges arise with the alignment of the opposing arches or the placement of the replacement teeth when other treatment methods are not suitable.⁵ Therefore, Andrews' Bridge is a suitable, less invasive choice for treating long span ridge defects.

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