

## Prosthodontic Management of Severely Resorbed Anterior Ridge Defect - A Case Report

Dr Kurienvarghese<sup>1</sup>, Dr Nitha Sankar<sup>2</sup>, Dr Arun K Joy, Dr Sony Vaidyan<sup>3</sup>

<sup>1</sup>Professor and Head of department prosthodontics Azezia College of Dental Sciences and research Kerala, India

<sup>2,3</sup>post graduate student department of prosthodontics Azezia College of Dental Sciences and research Kerala, India

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**Abstract:** It has been well acknowledged that anterior ridge defects present in a patient are very difficult to treat properly. These defects have been treated with immense amount of planning and difficulty while using the conventional treatment approaches like removable or fixed prosthesis and options of implant. The main aim and purpose of this article is thus, to describe the process of fabrication of Andrew's Bridge (a fixed - removable partial denture), to treat a Class III anterior ridge defect using natural teeth as abutments for its fixed component followed by a removable component.

**Key Words:** Andrew's Bridge; Class III ridge defect; Cobalt -Chromium alloy; Bar Attachment

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### I. Introduction

A deformed partially edentulous ridge is a major problem in the esthetic restoration of the anterior region. Deformities can be caused by traumatic extractions, trauma to the face, birth defects, implant failures or advanced periodontal disease. . However, to treat such defects when edentulous anterior portion of maxillary and mandibular ridges with both inadequate height and width ,the conventional options of fixed partial dentures (like bridges) or implant supported fixed partial dentures are not enough. For such cases where replacement of teeth along with the supporting structures necessary for aesthetics can be achieved by placing "Andrew's Bridge" This article presents a case report in which Andrews bridge was used to treat a patient with large defect in the anterior mandibular region

### II. <sup>1</sup>Case Report

A 46-year-old male patient came to the Department of Prosthodontics and Implantology, Azezia Dental College, with a complaint of unaesthetic appearance due to mobile Lower front tooth for which he wanted fixed replacement of his missing front teeth. Patient presented with mobility of tooth due to periodontal problems. On clinical examination there was grade III mobile 31,32,33,34,41,42,43. The edentulous ridge in relation to 31, 32, 33, 34, 41, 42, and 43 appeared narrow and resorbed.

The patient's ridge defect was classified based on Seibert's nomenclature . Intraoral clinical picture of the patient showed that there was loss of residual ridge horizontally as well as vertically at the edentulous space in the maxillary arch and hence it was categorized as Seibert's Class III type of ridge defect, thereby clinically making the implant placement a questionable procedure. The patient was not willing for surgical bone grafting along with implant placement. A conventional fixed partial denture was also not possible due to the severity of the bone defect.

Hence, a treatment plan was made to extract the mobile teeth 31,32,33,34,41,42,43 and an immediate denture was made for aesthetic purpose. An intentional RCT was planned for 35,36,44,45 since the tooth preparation cannot be prepared conventionally due to its position in the arch. The decision for construction of Andrew's bridge was based on the ridge defect obtained through Seibert's nomenclature. The whole procedure along with its advantages and disadvantages was explained to the patient and an informed consent was taken.

#### 2.1. Clinical Procedure

##### 2.1.1 Extraction procedure

Mobile teeth (31, 32, 33, 34, 41, 42, and 43) were extracted and an immediate denture using heat cure acrylic resin was made for aesthetic purpose.

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<sup>1</sup> Professor and Head of department prosthodontics Azezia College Of Dental Sciences and research Kerala, India

<sup>2</sup> Post graduate student department of prosthodontics Azezia College Of Dental Sciences and research Kerala, India

### **2.1.2 Endodontic treatment and abutment teeth preparation**

Abutment teeth (35,36,44 and 45) were endodontically treated and tooth preparation for PFM crowns was done creating a shoulder margin supragingivally.[Figure 1].

### **2.1.3. Mandibular abutment teeth impression**

Gingival retraction was done using gingival retraction cord(Ultrapak cord#000, USA) followed by full arch impression with polyvinyl siloxane impression material (Aquasil, Dentsply International Inc, USA) to accurately record the finish line .And definitive cast was obtained by pouring with type IV dental stone[Ultrarock, type IV dental stone, India].[Figure 4]. A provisional fixed restoration was made using auto polymerizing resin.

## **2.2 Laboratory Procedure**

### **2.2.1 Wax Up and Attachment of bar**

The metal framework of the Andrews bridge was made by using a preformed plastic bar attachment , which was adapted according to the curvature of the ridge. This was then connected to the wax pattern on the prepared teeth of the master cast. The whole pattern was then casted in cobalt-chromium alloy .

### **2.2.2. Metal frame work try in and occlusal registration**

The metal framework was tried in the patient's mouth and was checked for clearance between the bar attachment and underlying soft tissues. .[Figure 2,3,4,5].

### **2.2.3. Shade selection**

After satisfactory trial of the metal framework, shade selection was done for ceramic layering of the metal copings. .[Figure 6].

### **2.2.4. Pick up impression of metal frame work**

After completion of the metal try in the whole restoration with the bar was finished and polished. The temporary fixed partial denture was removed and the fixed component of the Andrew's System was placed over the prepared teeth . Then with the crowns in position, along with the bar, a pick up impression was made using polyvinylsiloxane material (AquasilDentsply) and a stone cast was poured. .[Figure 7,8,9].

### **2.2.5. Ceramic layering and teeth arrangement of removable prosthesis**

Ceramic layering of metal coping , artificial teeth arrangement , carving and polishing were done .[Figure 14].

### **2.2.6. Frame work and teeth arrangement try in**

Ceramic crown was placed and occlusion is verified.Occlusal rim with the teeth in position were placed on the bar attachment and occlusal verification was done. .[Figure 10,11,12,13]

### **2.2.7. Acrylisation of removable prosthesis**

Occlusal rim was replaced with pink colored heat cured acrylic resin with a clip placed in the lingual aspect to attach this RPD over the bar attachment. .[Figure 15,16].

### **2.2.8. Placement of final prosthesis**

The ceramic crown with bar attachment were cemented on the abutment with glass ionomer cement (GC Co, Tokyo, Japan). Removable prosthesis was clipped on the bar attachment.The patient was trained to properly insert and remove the RPD fabricated over the fixed component of Andrew's Bridge and proper oral hygiene (including interdental brush) instructions were given to the patient.. The patient was recalled and evaluated over a period of one year with intervals of three months each. The patient was comfortable and happy with the final outcome and had pleasing aesthetics and phonetics. .[Figure 17,18,19]



Fig.1 Prepared teeth



Fig 2.Metal try in

Fig 3.Occlusal view



Fig 4.Metal bridge in occlusion



Fig.5 Cast



Fig.6 Shade selection



Fig.7 Making pick up impression of metal frame



Fig.8Pick up impression



Fig.9 Obtained cast



Fig 10. Try in after ceramic layering



Fig.11 teeth in occlusion



Fig.12 Wax try in



Fig.13 Occlusal view



Fig.14 Cast with wax pattern



Fig.15 Heat cured teet



Fig.16 Clip in the lingual aspect



Fig.17 Final prosthesis in occlusion



Fig.18 Occlusal view



Fig.19 Patient profile after insertion of Andrews Bridge

### III. Discussion

Sibert (1983) identified three basic ridge deformities Buccolingual loss of tissues(class I), Apicocoronal loss of tissues (class II) and combination of buccolingual and apicocoronal loss of tissues (class III) .

Prosthetic dentistry involves the restoration and maintenance of oral functions, comfort, appearance and health of the patient by the replacement of missing teeth and contiguous tissues with artificial substitutes. Each restoration should be designed for the specific patient being treated. In some cases, a fixed-removable partial denture known as the Andrews bridge (Dr. James A. Andrews, Covington, La.) is superior to the conventional fixed or removable partial denture.

#### Indications

i. Absolute indications

- 1) Excessive residual ridge defect
- 2) Ridge defects / jaw defects either due to trauma and/or periodontal bone resorption
- 3) Cleft palate patients with congenital or acquired defects (3)

ii. Relative indications

- 1) Often fixed partial denture failure with badly damaged, cracked or weakened teeth by fillings and disproportionate teeth. (11)

#### Advantages

- 1) It includes all the advantages of fixed and removable partial dentures with better aesthetics, hygiene along with better adaptability and phonetics.
- 2) It is comfortable and economical for patients.
- 3) There is no lingual extension as in RPD.
- 4) No soft tissue impingement and the surrounding structures.

The system acts as stress breaker while transmitting unwanted leverage forces.

Main advantage of Andrew's Bridge System is the criterion of the removable part which can be easily used by patient for hygienic access to abutments and surrounding structures, in addition to adding support to the lost tissues(12). By virtue of the precision fit, the acrylic segment can be removed or inserted over and over again without losing retention. Limited reports of the failure of such prosthesis are found in

the literature(5). The failures are mainly due to inadequate soldering. However, this was completely eliminated by attaching retainers to the bar in a single casting.

More recently, spark-erosion technology has been introduced to dental technology in which a primary bar casting joining the implants and a removable metal superstructure upon which the replacement teeth are processed(10). Both the Andrews bar system and the spark - erosion overdentures have the similarity of having the advantages of the totally implant supported fixed partial denture and the implant supported overdenture(13).

It has been reported that there is high incidence (91%) of residual ridge deformity after tooth loss. Only 9% of the patient's with the anterior teeth missing between the two canines did not have ridge defects(3). The most commonly seen defects are the combined Class III defects (56% of cases) followed by horizontal defects Class I (33% of the cases)(4,5). This resorption is further increased in patients without dentures or implants and in cases with trauma or congenital defects.(6)

### **Summary**

The conventional options of fixed partial dentures with bridges or implant dentures will not suffice aesthetically when the edentulous anterior portion of mandibular ridge has both inadequate height and width(7). Surgical correction of the defects using grafts and placement of implants is an expensive treatment plan for some patients. This situation can pose quite a challenge to the clinician.

Andrew's bridge is the best option in clinically challenging situations where replacement of teeth along with the supporting structures necessary for aesthetics. "Andrew's Bridge" is a combination of a fixed dental prosthesis incorporating a bar with a removable dental prosthesis that replaces teeth within the bar area, usually used for edentulous anterior spaces. The vertical walls of the bar provide retention for the removable component of the Andrew's Bridge(8,9). Andrew's bridge was developed when all the conventional methods of replacement were not successful in treating severely resorbed residual ridge, in order to achieve comfort, hygiene, phonetics and primarily esthetics(10).

The Andrew's system based on the type area of bar attachment:

- 1) Pontic supported
- 2) Bone anchored or implant supported Andrew's bar system.

### **IV. Conclusion**

Andrews Bridge System is a fixed removable prosthesis that is indicated in patients with large ridge defects with maximum aesthetics, hygienic and good fit, along with minimal trauma to soft tissues and surrounding structures or underlying bone at an economic price.

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