



RESEARCH ARTICLE

ANDREW'S BRIDGE – ESTHETIC FIXED REMOVABLE APPROACH FOR MAXILLARY ANTERIOR DEFECT: A CASE REPORT

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ABSTRACT

Replacement of anterior teeth is challenging for patients with traumatic injuries when there is loss of soft tissue along with teeth. To achieve esthetics and phonetics, closure of the defect is necessary either with fixed or removable prosthesis. Due to periodontal considerations and extent of the defect, fixed prosthesis is not always feasible; whereas removable prosthesis is also less retentive and normally uncomfortable. So fixed removable prosthesis (Andrews Bridge) can be used to overcome these issues. The Andrews system is basically composed of two components: Fixed component (retainers on abutments joined by bar) and removable component. Hereby, we are presenting a case of missing maxillary anterior teeth with Seibert's Class III ridge defect rehabilitated using Andrews Bridge. Andrews Bridge permits rehabilitation of congenital and acquired esthetic defects and fulfils both hygiene and esthetic requirements.

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INTRODUCTION

Prosthodontics is all about replacement of missing structure by artificial prosthesis so as to restore function, esthetics, and comfort (Jain *et al.*, 2016). Rehabilitation of anterior teeth with defect is difficult with respect to esthetics and phonetics. Several options like removable prosthesis, fixed prosthesis and implant prosthesis are available. Seibert classified anterior defect as,

- **Class I-** Buccolingual loss of tissue contour with a normal apicocoronal height.
- **Class II-** Apicocoronal loss of tissues with normal buccolingual contour.
- **Class III-** Combination of buccolingual and apicocoronal loss of tissues (Sajjad, 2017; Kolaganti *et al.*, 2014).

In cases of class III defect, it is difficult to satisfy patient with removable prosthesis due to lack of retention. Treatment with fixed prosthesis and implant is difficult as it fails to restore the soft tissue defect and does not satisfy esthetic and hygiene needs.

In such cases treatment with Andrews bridge can be good option (Jain *et al.*, 2016). Andrews bridge consists of a bar attached to abutments and a removable prosthesis which is attached on the bar with precision fit metal sleeves. With this kind of prostheses unhealthy, unattractive dentition with poor function can be transformed to comfortable, healthy and esthetic dentition. This report presents a case of replacement of 32 year male patient Seibert's class III defect with fixed removable prosthesis.

Case report: A 32 year old male patient reported in department of prosthodontics with the chief complaint of poor esthetics due to missing teeth. A complete medical and dental history was obtained. Patient gave history of trauma five years back and loss of anterior teeth because of trauma. He was treated for the traumatic injuries, and fixation was done with metal plates. Intraoral examination revealed missing teeth 11, 12 and 21. The defect on the ridge was Siebert's Class III (Fig 1). Patient's main concern was esthetics and phonetics. Orthopantomograph was taken. OPG showed good bone support around the abutments (13 and 22). Various treatment options available were implant supported prosthesis with bone graft, conventional fixed partial denture, conventional

removable partial denture and fixed removable partial denture (Andrews bridge). Andrews's bridge was planned for the patient using 13 and 22 as abutments. PFM crowns with bar attachment were planned which is to be permanently cemented on abutment teeth and removable prosthesis which is attached with metal sleeves on the bar. This fixed removable prosthesis has advantages of hygiene, esthetics and phonetics which cannot be met by fixed prosthesis alone. Replacement with implant was not considered in this patient as it required extensive bone graft procedures possibly with soft tissue regeneration that would require months of healing period and the outcome is unpredictable. The patient also expressed financial constraints.

Procedure

- Diagnostic impressions of maxillary and mandibular arches were made using alginate impression material (Densply) and casts were poured (type II gypsum).
- The cast were mounted on a semi adjustable articulator with facebow transfer and maximum intercuspation using an intraoral record. Mock up was done to have esthetic idea about the prosthesis.
- Tooth preparation was done with 13 and 22 for PFM crowns (Fig 2). Retraction cord was placed for gingival retraction (medi-pak 000). Final impressions were made with elastomeric impression material (Silagum elastomeric impression material) and master casts were poured (type IV gypsum).
- Provisional's were cemented.
- Wax pattern was made on the abutment teeth and bar was fabricated according to the curvature of the ridge and was attached to the abutment teeth (Fig 3). Wax pattern was tried in patient's mouth (Fig 4). The bar was positioned parallel to the ridge for the least restrictive path of insertion. 2-3 mm clearance was maintained between the bar and the alveolar ridge to facilitate maintenance of hygiene by the patient. Whole assembly was then casted in nickel chromium alloy.
- Metal trial was checked in the patient's mouth for shape and angulation of bar and occlusal clearance of crowns. Shade was selected under daylight. (Fig 5)
- After fabrication of metal bar with PFM crowns acrylic removable denture was made. During the next visit, fixed retainer part of the Andrews system (the bar and crown) was cemented over the prepared teeth using Type I glass ionomer cement (GC Fuji I) (Fig 6).
- With the fixed components in position an impression was made with irreversible hydrocolloid impression material and dental stone cast was poured for the processing of the RPD. Waxed up denture replacing 11, 12 and 21 was fabricated and metal sleeves were attached on inner surface of it (Fig 7). Trial removable denture was checked in patient's mouth (Fig 8).
- After satisfactory esthetics and phonetics was achieved in patients mouth, the trial denture was processed in heat cure acrylic resin, finished polished and tried in patient's mouth over the fixed components of the Andrews bridge system. At the final visit, passive fit and retention of the cast sleeve over the bar was checked (Fig 9).
- Later patient was given education about removal and placement of RPD fabricated on the fixed bar. Post operative maintenance instructions were given and the patient was recalled periodically for checking adaptability and success of prosthesis.



Figure 1. Preoperative



Figure 2. Tooth Preparation



Fig. 3. Wax Pattern try-in



Fig. 4. Wax Pattern try-in



Figure 5 - Metal Trial



Figure 6. Cementation of Fixed Assembly



Figure 7-Metal Sleeves on Inner Surface of RPD



Figure 8. Try In of Removable Assembly



Figure 9- Final Prosthesis in mouth

DISCUSSION

Replacement of anterior teeth esthetically is challenging in cases with soft and hard tissue defect. Anterior defect is mainly classified from Class I to Class III (3). Various treatment options available are implant supported prosthesis with bone graft, conventional fixed partial denture, conventional removable partial denture and fixed removable partial denture. Removable prosthesis lack adequate retention whereas conventional fixed prosthesis are unesthetic as replacing papilla in between fixed prosthesis is difficult (Kolaganti *et al.*, 2014).

Replacement with implant supported prosthesis is expensive and requires preprosthetic surgeries that would require long healing period. As both fixed and removable prosthesis are not satisfactory in fulfilling the requirements of esthetics, phonetics, retention and comfort, Andrews bridge is preferred over them. Dr. James Andrews of Amite Louisiana (Institute of Cosmetic Dentistry, Amite, LA, USA) was the first to introduce a fixed-removable prosthesis (Bhapkar *et al.*, 2015; Everhart, 1983; Tambe *et al.*, 2014). The Andrews system is basically composed of two components: Fixed component (retainers on abutments joined by bar) and removable component. The conventional Andrews system requires a castable bar (incorporated in the fixed component) and sleeve (incorporated in the removable component) attachment, which provides a precision while seating and retention (Rathee *et al.*, 2015).

The Andrews system is usually of two types based on the area of bar attachment.

- Pontic supported Andrews bar system.
- Bone anchored or implant supported Andrew's bar system (Kolaganti, 2014; Tambe *et al.*, 2014)

Andrews bridge is indicated when there is excessive residual ridge resorption and large ridge defects due to congenital reasons like cleft patients, trauma or surgery. Andrews's bridge is economical and fulfils hygiene and esthetic requirements. Andrews bridge helps to transmit unwanted leverage forces (Bhapkar *et al.*, 2015; Tambe *et al.*, 2014; Immekus, 1975; Shillingburgh *et al.*, 1997; Mueninghoff, 1982). Considering the size and location of the restoration, rehabilitation using Andrew's bridge provides a minimally invasive medium-term solution. A major advantage of the Andrew's system is that the pontic assembly can be removed to facilitate hygiene procedures and may be relined as the ridge resorbs. This type of prosthesis has minimal soft tissue trauma and has comparable fit between the fixed as well as removable components used in it (Taylor, 2014). Few limitations of Andrews bridge include proliferation of soft tissue after placement of the bar too close to the gingival tissues, which affects oral hygiene, fracture of the solder joint can also occur if there is insufficient material or insufficient occlusal clearance (Andrew, 1999). However, these can be prevented by appropriate case selection and careful designing and maintenance.

Conclusion

Andrews bridge permits rehabilitation of congenital and acquired esthetic defect. Andrews bridge is basically indicated in cases of poor esthetics because of tissue loss. Andrews bridge provides good esthetics, easy hygiene maintenance, and transmits occlusal forces. It is an economical treatment option.

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