

Management of A Mandibular Anterior Edentulous Area Associated With An Alveolar Defect Using Andrew's Bridge System.

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Abstract : Anterior ridge defects either congenital or acquired require not only the replacement of the missing teeth but also the replacement of supporting structures for an esthetic outcome. In such situations treatment options like Andrews bridge system can provide a functional and esthetic alternative without the need for soft or hard tissue augmentation. This article presents a case report of rehabilitation of lower anterior ridge defect with an Andrews bridge using canine as abutments for its fixed component on which the removable component is placed.

Keywords: Bone resorption, Congenital defects, Dentures, Esthetics, Fixed partial denture,

I. Introduction

Loss of teeth and accompanying alveolar bone resorption either due to trauma, congenital defects, traumatic extractions or advanced periodontal disease presents a challenging situation to the prosthodontist. Rehabilitation of large anterior ridge defects not only requires replacement of missing teeth but also include restoration of a bone defect, aesthetics, and phonetics[1]. In such a situation when patient opts for a fixed treatment, both fixed partial denture and implant supported denture may not be able to fulfill all the requirements. A fixed removable partial denture known as Andrews bridge (Dr. James A. Andrews, Covington, La.) can be a suitable option. Andrews bridge has a pontic assembly that can be removed by the patient for preventive maintenance. The Fixed component has two retainers either porcelain fused to metal or full veneer metal that are cemented to their abutments permanently and connected to each other by a rectangular bar that follows the curvature of the ridge underneath. The removable component is retained by a clip on the intaglio surface that fits precisely over the bar attachment. This type of prosthesis has qualities of both fixed partial denture² and removable partial denture.

Primary indications for Andrews bridge prosthesis are:[2],[3]

- Cases where residual ridge has been partially lost due to some congenital defects trauma or other pathologic process and a conventional FPD would not restore patient's missing teeth and supporting structures adequately.
- Differences in the alignment of the opposing arches or segmental deficiency of a particular arch do not allow esthetic replacement of teeth by conventional FPD.
- Patients with periodontal problems.
- Cleft lip/palate patients with congenital or acquired bone defects.

II. Case Report

A female patient, aged 20 years, reported to the Department of Prosthodontics Government Dental College Trivandrum with a chief complaint of missing lower front teeth. Fig 1. History revealed that she had met with a road traffic accident 4 years back resulting in loss of lower anterior teeth. The patient has been using an interim RPD replacing the missing teeth for the past four years but was not satisfied with the esthetics and function. On intraoral examination it was seen that 31,32, 41 and 42 were missing. Fig 2. There was a significant reduction in the height and width of the residual alveolar ridge in the mandibular anterior region (Siebert class III)[4]. Orthopantograms and Intraoral periapical radiographs were made which showed good bone support around the abutment teeth (33 and 43). Fig 3. The patient was informed about the various treatment options, she wanted a fixed replacement but due to economic constraints was not ready for the implant supported prosthesis. Also, placement of implant would have required pre-prosthetic surgeries such as graft placement requiring long healing time with an unpredictable outcome. The fixed dental prosthesis was also not suitable for such a situation. The Patient was not satisfied with a removable prosthesis and if not maintained

properly it would lead to decalcification and dental caries or periodontal problems.[5],[6],[7].Therefore a fixed removable prosthesis was planned for prosthodontic rehabilitation of partially edentulous mandibular arch.



Fig 1. Preoperative Photograph.



Fig 2. Preoperative Intraoral Photograph



Fig 3. Orthopantomogram

III. Procedure

- [1]. Diagnostic impressions of the maxillary and mandibular arches were made with irreversible hydrocolloid(Zhermack, Tropicalgin) and the casts were made .
- [2]. After the facebow transfer, with the help of a semi-adjustable articulator the casts were mounted and a diagnostic wax-up was done to evaluate the esthetics.
- [3]. The abutment teeth (33 and 43) were prepared to receive PFM crowns .Fig 4.Gingival retraction was done using chemico-mechanical method and using polyvinylsiloxane impression material (Aquasil Putty Material, Dentsply), the impressions were made.
- [4]. The Prepared teeth were temporized using tooth colored self-cure acrylic resin by indirect technique, master casts were poured in Type IV dental stone and mounted onto a semi-adjustable articulator.
- [5]. Removable dies were prepared, a wax pattern of coping for PFM retainers 33 and 43 were made and connected with a prefabricated castable plastic bar attachment .The bar was positioned parallel to the

residual alveolar ridge and around 2-3 mm of space was left between the bar and the crest of the ridge for maintenance of hygiene .The copings along with the bar were cast in cobalt chromium alloy.

- [6]. The trial of the metal framework was done to check for aesthetics, phonetics, and proper hygiene access. Fig 5.Shade selection was done for the ceramic build up of the PFM retainers. After polishing and finishing porcelain fused to metal crowns with the bar were cemented using an interim restorative material. Fig 6, Fig 7.A pick -up of assembly was made using elastomeric impression material and a cast was poured in die stone for the processing of removable partial denture.
- [7]. The teeth were set, waxed up and denture was processed in heat cure acrylic resin. After finishing and polishing of the denture, it was tried in patient's mouth over the fixed component of the Andrews bridge. The clip was attached to the bar and was picked in removable partial denture using self-cure acrylic resin.
- [8]. The removable prosthesis was removed, finished properly and the retention of the clip over the bar was checked. Fig 8. The esthetics and phonetics were evaluated and the patient was trained to remove the prosthesis. Fig 9, Fig 10.Oral Hygiene instructions were given and periodic recall was emphasized to evaluate the success of the treatment.



Fig 4. Tooth preparation on 33,43



Fig 5. Metal try-in of bar component



Fig 6. Pick up impression of the metal copings attached with bar



Fig.7. Cemented PFM crowns with attached bar.



Fig.8. Fixed component and removable component.



Fig .9.Post operative intra-oral view



Fig.10.Post-operative view.

IV. Discussion

Patients with a history of trauma usually report with loss of teeth as well as localized alveolar ridge defects. It has been documented that only 9% of the patients with anterior missing teeth between two canines did not have ridge defects. Siebert class III defects are the most commonly seen defects (56% of the cases followed by class I horizontal defects (33% of the cases)[8]. Vertical defects are seen in 3% of the cases[9]. Replacement of teeth in the anterior region is a challenging task which gets further complicated if ridge deformity is present. In such cases, Andrew's bridge is a good option because it provides maximum aesthetics, optimum phonetics and hygiene access to the abutment and supporting tissues[10]. Andrews bridge is a completely tooth-borne so it's more stable (compared to a conventional removable partial denture), retentive and also the occlusal forces are directed towards long axis of the supporting teeth[2]. Also the removable component can be relined as the ridge resorption occurs[2]. In comparison to a fixed dental prosthesis pontic teeth are arranged during try-in appointment. Flange of the removable prosthesis can be modified to improve esthetics, phonetics and comfort of the patient. Andrews system has also been well adapted in implant prosthodontics[11]. Very few reports of failure have been found in the literature, the main reason being inadequate soldering. This was completely removed by fastening retainers to the bar in one casting[12]. Fracture incidence and repairs in the removable component were similar to conventional removable partial dentures and which can be easily repaired. The patient was recalled and reviewed over a period of time. She was satisfied with the final outcome of the prosthesis.

V. Conclusion

Andrews bridge which consists of a fixed retainer and a removable pontic is a good treatment option for congenital or acquired ridge defects when conventional methods are contraindicated it permits the replacement of lost teeth as well as supporting tissues restoring speech and esthetics.

References

- [1]. Studer S, Naef R, Scharer P. Adjustment of localized alveolar ridge defects by soft tissue transplantation to improve mucogingival esthetics: A proposal for clinical classification and an evaluation of procedures. *Quintessence Int* 1997;28:785-805.
- [2]. Mueninghoff KA, Johnson MH. Fixed-removable partial denture. *J Prosthet Dent* 1982;48:547-50.
- [3]. Stein RS. Pontic - residual ridge relationship: A Research Report. *J Prosthet Dent* 1966;16(2):251-85.
- [4]. Seibert JS. Reconstruction of deformed, partially edentulous ridges, using full thickness onlay grafts. Part I. Technique and wound healing. *Compend Contin Educ Dent* 1983;4:437-53.
- [5]. Douglass CW, Watson AJ. Future needs for fixed and removable partial dentures in the United States. *J Prosthet Dent* 2002;87:9-14.
- [6]. Carlsson GE, Hedegård B, Koivumaa KK. Studies in a partial dental prosthesis. IV. Final results of a 4-year longitudinal investigation of dentogingivally supported partial dentures. *Acta Odontol Scand* 1965;23:443-72.
- [7]. Bergman B, Hugoson A, Olsson CO. Periodontal and prosthetic conditions in patients treated with removable partial dentures and artificial crowns. A longitudinal two-year study. *Acta Odontol Scand* 1971;29:621-38.
- [8]. Abrams H, Kopczyk RA, Kaplan AL. Incidence of anterior ridge deformities in partially edentulous patients. *J Prosthet Dent* 1987;57: 191-4.
- [9]. Garber DA, Rosenberg ES. The edentulous ridge in fixed prosthodontics. *Compend Contin Educ Dent* 1981;2:212-23.
- [10]. Sadig W.M. Bone Anchored Andrew's Bar System-A Prosthetic Alternative. *Cairo Dental Journal*. 1995;11:11-15.
- [11]. Andrews JA, Biggs WF. The Andrews bar-and-sleeve-retained bridge: A clinical report. *Dent Today* 1999;18:94-6, 98-9.
- [12]. Chandra S, Singh A, Gupta H, Chandra C. Treatment using functionally fixed prosthesis: A case report. *J Indian Prosthodont Soc* 2014;(14 Suppl 1):206-9.