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Case Report

Andrew's bridge: A prosthetic option for missing anterior teeth with severe ridge defect

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ABSTRACT

Prosthodontic rehabilitation of mandibular anterior missing teeth with large ridge defect due to poor abutment support and inadequate quality and quantity of bone. Often, a customised treatment plan has to be drawn to meet patient's requirement of estheics, form, function and longevity of the prosthesis. This article describes procedure for fabrication of fixed-removable type of prosthesis in such cases.

1. Introduction

Prosthodontic rehabilitation of a large anterior ridge defects is often a challenge. Loss of residual ridge contour may lead to un-aesthetic open gingival embrasures, food impaction, and percolation of saliva during speech.[1] Replacement of the lost teeth in such case requires that the deficient supporting tissues be restored for an aesthetic outcome of the resulting prosthetic replacement. These defects can be restored by surgical intervention[2,3] or by artificial substitutes. An Andrews Bridge, is a fixed-removable prosthesis that was first introduced by Dr. James Andrews of Amite Louisiana (Institute of Cosmetic Dentistry, Amite, LA, USA),[4] is one of the treatment modalities indicated in patients with large ridge defects. It consists of fixed retainers and removable pontics.[5] Apart from providing maximum aesthetics and optimum phonetics in cases involving considerable supporting tissue loss or when alignment of the opposing arches or aesthetic position of the replacement teeth creates difficulties, another favourable criterion of the Andrew's bar system is that it can be removed by the patient for hygiene.[6–8] This forms an alternative faster and efficient treatment option compared to surgical correction and rehabilitation following the placement of implants.[9,10]

This case report shows the fabrication of a fixed-removable partial denture using the Andrews Bridge philosophy wherein a removable prosthesis is retained by a bar and sleeve attachment to fixed retainers on the either side of the edentulous space. This prosthesis is designed to meet the requirements for aesthetics, comfort, phonetics, hygiene, and favourable stress distribution to the abutments and soft tissue.

2. Case Report

A 25-year-old male patient reported to the hospital with the chief complaint of spacing in his upper front teeth and missing lower front teeth. A complete medical and dental history was obtained. History revealed that he had met with a road traffic accident 1 years back and had multiple fractures of the middle and lower third of the face involving the maxillary and mandibular bones and loss of several anterior teeth. He was treated for the traumatic injuries, and fixation was done with metal plates and intermaxillary

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fixation of the teeth was done. The patient was using interim RPDs replacing the missing teeth for 10 years but was not satisfied with the aesthetics and function of the prosthesis.

Extraoral examination revealed that lower lip support was reduced. On Intraoral examination, spacing was present between teeth in maxillary anterior region. Crossbite was present in canine region. Teeth # 41 and 31 were missing although the edentulous span appeared much more. Teeth # 32 and 42 were distally tipped with mobility (Figure 1). Group function occlusion was present on both sides. OPG shows very poor bone support for 32 and 42 (Figure 2). The ridge defect was found to be a severe Seibert's Class III (i.e., deficient in both height and width).[2] A decision was thus made to fabricate a custom cast bar and sleeve design Andrews bridge. The Andrews bridge provides good esthetics, improved phonetics, and facial musculature support through its ridge replacing acrylic removable component. Another advantage of Andrews bridge is that it can be removed by the patient for improved hygiene access to the pontic area.

Fig. 1: Preoperative view

Fig. 2: OPG

3. Procedure

Treatment began with extraction of teeth # 32 and 42 since they were poor abutment due to reduced alveolar support (Figure 3). Teeth # 33 and 43 i.e., both mandibular canines were chosen as abutments. Patient was recalled for follow up and assessment. Once healing was complete, abutment preparation was done with juxta-gingival finish line for receiving full coverage metal ceramic retainers. Impressions of maxillary and mandibular arch were made using putty was technique with a stock tray and models were poured with type IV dental stone. Horix bar attachment (Preci-Horix, Alphadent Nv, Belgium) (Figure 4) was used for fabrication of bar attachment. Wax pattern was fabricated on prepared abutments and semi-preicison plastic bar was attached to the patterns, 3mm above the residual alveolar ridge, for fabrication of bar attachment. Two halves of the bar were attached to meet at an obtuse angle in midline (Figure 5), in order to improve the stability of the removable prosthesis. Wax pattern try-in was done. Entire structure was sent to laboratory for casting using cobalt chrome alloy. After finishing and polishing, metal framework was tried into patient mouth and evaluated for marginal fit & accuracy and space between ridge and bar.

Fig. 3: Post extraction of teeth # 32 & 42

Fig. 4: Preci- Horix – Ceka Preciline attachment

Wax occlusal rim over the partially edentulous area was fabricated on the model and teeth setting was done, which was evaluated for aesthetics. Teeth were arranged in edge to edge relation without any anterior guidance. Removable partial denture was then fabricated using heat cured poly methyl methacrylate (PMMA). Female components of the semi-precision attachment i.e., metal housing and plastic sleeves were placed over each halves of the metal bar before

Fig. 5: Wax pattern and preformed plastic bar attached at an obtuse angle in midline

packing of the acrylic resin. Ceramic veneering over the metal copings of the retainers was done according to the selected shade.

Bar and crown assembly was now cemented over the prepared abutments (Figure 6). Removable denture was placed over the bar and evaluated for retention and stability (Figure 7). Instruction for hygiene and prosthesis maintenance was given and patient was recalled for follow up after 24 hours and 7 days.

Fig. 6: Bar and crown assembly cemented over abutments

Fig. 7: Removable denture in place with help of sleeves

4. Discussion

Rehabilitation of missing anterior mandibular teeth with severe ridge defect using fixed removable type of prosthesis such as andrew's bridge is a pragmatic approach to major concerns of the patient such as retention, stability, aesthetics, hygiene & economy. The Andrew's bridge with its acrylic saddle provides lip support, improves esthetics, phonetics, eliminates food traps, and can be removed by the patient for hygiene access.[6]

A conventional FPD if planned as it would result in distinctly long unaestheticpontics in an effort to camouflage deficiencies in the ridge underneath with poor facial musculature support and food entrapment. In an effort to regain lost ridge volume many authors have advocated soft-tissue surgeries such as interpositional grafts and onlay grafts,[11–13] however none offer a predictable outcome even after aggressive invasive approach.[14] An implant retained FPD was a viable alternative but would require prior osseous and connective tissue grafts entailing protracted treatment time and high cost.

Many authors[5,7,8] have concluded that Fixed removable partial dentures are particularly indicated for patients with extensive supportive tissue loss and when the alignment of the opposing arches and/or esthetic arch position of the replacement teeth create difficulties. Preiskel[15] described other advantages of this system such as reduced bulk (minimal vertical and horizontal extensions) of removable prosthesis, good retention and little wear with use. Duplicate removable prostheses can be made quickly because special transfer sleeves are available. This type of prosthesis has minimal soft tissue trauma and has comparable fit between the fixed as well as removable components used in it.[10] In an effort to meet patient's need, clinician can also adapt andrew's bridge concept to the implant systems.[11]

Literature shows few cases of failure of this approach. The failures are mainly due to casting defects. However, this was completely eliminated by attaching retainers to the bar in a single casting.[9] The patient was comfortable with the final outcome and had pleasing esthetics and phonetics.

5. Conclusion

Andrews Bridge system is a fixed-removable prosthestic option which on its judicious application in patients with few missing teeth and large localized ridge defect, provides functionally fixed prosthesis that successfully replaces the missing teeth along with closure of the defect, restores speech, esthetics, lip support, patient friendly in terms of hygiene maintenance, cost and time.

6. Source of Funding

None.

7. Conflict of Interest

None.

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