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Case report: Andrews bridge: A saviour in anterior defects

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Abstract
The restoration of composite bone defect is always a challenge. When it is an anterior partially edentulous area then the prime importance is the esthetic outcome of the prosthesis. A combination of fixed and removable prosthesis such as Andrews bridge can be utilized to give an excellent esthetic result. Andrew's bridge restores the orofacial structures by replacing the lost natural teeth and the supporting tissues. This case series describes the successful treatment of severe anterior bone defects due to trauma which was restored with the help of Andrew's bridge.

Keywords: Andrews bridge, esthetics, wical and swoope, sieberts, composite defect of alveolar ridge

Introduction
Esthetics and function play an important role in formulating a treatment plan. Prosthodontist designs smile to restore function, satisfy patient comfort and at the same time bring about natural looking appearance of the teeth [1].
Many treatment modalities have been chosen for the replacement of missing anterior teeth. Fixed partial dentures, implant supported prosthesis or removable prosthesis can successfully rehabilitate the defect. However, defects which include loss of alveolar bone are difficult to manage with fixed or removable prosthesis due to unesthetic results [2].
Andrews Bridge is a combination of fixed and removable prosthesis and is a propitious choice of treatment. Dr. James Andrews of Amite Louisiana (Institute of Cosmetic Dentistry, Amite, LA, USA) was the first to introduce this prosthesis in 1965 [2-4].
Andrews Bridge has a pontic assembly which is removable by the patient for preventive maintenance. The retainers are either porcelain fused to metal (PFM) or full veneer metal, which are permanently cemented to the abutments. The retainers are joined with prefabricated castable bar and then cast together, or a prefabricated metal bar is soldered to the metal copings after casting. The removable pontics are retained by a clip on the intaglio surface which fits precisely over the bar attachment. These attachments are particularly indicated in patients with composite defect of alveolar ridge with excessive loss of bone height, compromised residual ridge due to trauma or congenital defects [4].
The following case reports display patients treated with Andrew's Bridge to restore function, esthetics, comfort which brings about favourable stress distribution to soft tissue and abutments [5].

Case 1
A 27 Yrs old male patient reported to the Department of Prosthodontics with the chief complaint of compromised esthetics due to missing upper front teeth. Patient gave history of fall on his face about 2 to 3 months ago playing sports which caused him to lose some teeth immediately. Few teeth were lost over period of time due to increased mobility. Patient gave no relevant medical history. On Extra-oral examination, patient revealed mild scar on his upper lip area which was covered by moustache. On Intra-oral examination, patient revealed missing 11, 21 & 22 with large alveolar defect, extending from mesial aspect of 12 to 23 due

to trauma which was presented as thin knife edge residual ridge along with vertical height lost. The defect can be classified as Class II defect according to Wical and Swoope and Sieberts classification [6]. After complete evaluation, the patient was suggested the following treatment options namely, removable partial denture, fixed partial denture from 13-23, bone augmentation surgery followed by an implant supported prosthesis or a fixed removable prosthesis.

Fig 1: Pre-OP Intra-Oral (Front View)

Andrews Bridge has various advantages such as, being a removable prosthesis. It fits and retains into the defect area, provides easy maintenance of oral hygiene, easy to adjust chairside
& also if shade matching is done properly it gives excellent esthetic result. After proper oral health instructions, explanation of merits and de-merits of treatment procedure, patient gave an informed consent for Andrews bridge prosthesis.

Fig 2: Pre-OP Extra-Oral (Front View)

Fig 3: Face bow orientation record

Treatment

Upper and lower Diagnostic impressions were made using Irreversible hydrocolloid (Tropicalgin Zhermack, Germany) and it was poured with Type IV Dental Stone (Kalrock, Kalabhai, Mumbai). Orientation for Maxillary dentition was recorded using facebow transfer and it was then transferred to the semi-adjustable articulator. (Fig.3) Centric and protrusive bites were recorded using Bite registration wax (Perfect Bite, Maarc India). After programming of the articulator, diagnostic wax up was done to simulate the prosthesis which can also be used for Provisionalisation. Tooth preparation was done using diamond burs (Mani, India) with [13, 12, 23] to receive PFM retainers. Gingival retraction was done using 000 retraction cord. (Ultrapack, Ultradent products Inc.) followed by final impression using A-silicone (Honeygum, DMG, Germany) by two stage impression technique. Provisionals (Luxatemp, DMG, Germany) were temporarily cemented (NETC, Medicept). Wax pattern for coping was fabricated on prepared teeth using Inlay casting wax (Renfert, Germany).

Fig 4: Metal coping try in with bar attachment in place

Fig 5: Wax up trial of removable prosthesis on semi-adjustable articulator with bisque trial

Fig 6: Intra-oral view of wax up trial Intra-orally with bisque trial (front view)

Fig 7: Occlusal view of wax try in bisque trial

Fig 8: Final prosthesis cemented (Right lateral view)

Fig 9: Final prosthesis cemented (Front view)

Bar attachment pattern (CEKA Preci-line Attachment) was attached to the wax pattern. The whole assembly was casted. After retrieval, casting was sandblasted and then finished and checked for fit on cast. Wax rim was fabricated over soft retentive tags which acts as female component in prosthesis. Metal try in was done for fitting of copings and for space for ceramic layering. Shade selection was using Vita Classical shade guide (Fig.4). Ceramic layering was done on the copings and later sintered. Teeth arrangement was done for removable part of prosthesis (Fig.5). Try-in procedure was done for esthetics, phonetics, lip support and occlusion. (Fig.6 & 7). After patient's approval for prosthesis final glazing was done for the ceramic crowns. Acrylization was carried out for removable prosthesis. After finishing and polishing each prosthesis was placed intraorally and evaluated. Ceramic crowns were cemented using GIC luting cement (Xtralute, Medicept) (Fig.8 & 9). Post-operative and oral health instructions were explained to the patient. He was recalled at 1-week interval for 1 month and then after every 6 months for evaluation.

Case 2

A 35 Yrs old male patient reported to the Department of Prosthodontics with chief complaint of compromised esthetics due to missing teeth in his lower front region of jaw since last 5 to 6 months due to trauma.

On intra-oral examination, large alveolar defect was present extending from of 33 to 43 due to trauma which was present as thin knife edge residual ridge with vertical height lost. The defect can be classified as Class III defect according to WICAL AND SWOOPE and SIEBERTS classification.6 The patient had undergone extraction of [31, 32, 36, 37, 41, 42, 46]. Root piece was present with [16]. Peg shaped lateral incisor was present with [22]. Congenitally missing [12].

After complete evaluation, the patient was suggested the following treatment options namely, removable partial denture, fixed partial denture from [33-43], bone augmentation surgery followed by an implant supported prosthesis or a fixed removable prosthesis.

Patient was explained about the duration of treatment, number of appointments needed, maintenance of prosthesis and importance of oral hygiene maintenance, advantages and disadvantages of Andrew's bridge prosthesis.

Fig 10: Tooth preparation with gingival retraction using 000 retraction cord

Fig 11: Wax coping trial with cashable attachment on prepared teeth

Fig 12: Metal coping try in with bar attachment in place

Fig 13: Final prosthesis intra-orally (front view)

Treatment

Amongst all the treatment options advised for such a case, it was decided to give Andrews Bridge due to long edentulous span. Diagnostic wax-up was done with both maxillary and mandibular arches. Tooth preparation was done with 33 and 43 to receive PFM retainers. The bar for Andrews Bridge for mandible was attached during wax-up stage. Removable prosthesis was fabricated over the fixed bar. Fig. (10-13).

Case 3

A 35 Yrs old male patient reported to the Department of Prosthodontics with chief complaint of compromised esthetics due to missing teeth in his upper and lower front region of jaw since last 5 to 6 months.

On intra-oral examination, large alveolar defect was present extending from mesial aspect of 12 to 22 and 33 to 43 due to trauma which was present as low well-rounded edge residual ridge with vertical height lost. The defect can be classified as Class III defect according to WICAL AND SWOOPE and SIEBERTS classification [6]. After complete evaluation, the patient was suggested the following treatment options namely, removable partial denture, fixed partial denture from 33-43, bone augmentation surgery followed by an implant supported prosthesis or a fixed removable prosthesis.

Patient was explained about the duration of treatment, number of appointments needed, maintenance of prosthesis and importance of oral hygiene maintenance, advantages and disadvantages of Andrew's bridge prosthesis.

Fig 14: Pre-op intra-oral (Front view)

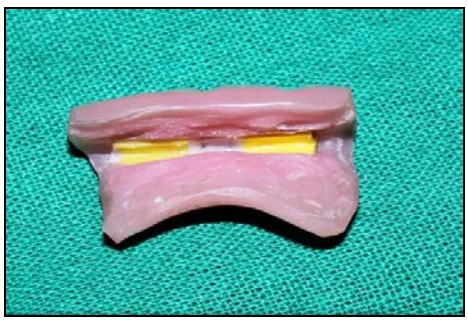

Fig 15: Intaglio surface of final prosthesis

Fig 16: Bisque trial with bar attachment in place

Fig 17: Final prosthesis intra-orally (Front view)

Treatment

Amongst all the treatment options advised for such a case, it was decided to give Andrews Bridge for the mandibular arch due to long edentulous span and fixed partial denture for maxillary arch. Diagnostic wax-up was done with both maxillary and mandibular arches. Tooth preparation was done with 12, 22, 33 and 43 to receive PFM retainers. The bar for andrews bridge for mandible was attached during wax-up stage. Fixed partial denture was fabricated for maxillary teeth & removable prosthesis over the fixed bar was fabricated for mandibular edentulous span. Fig. (14-17)

Discussion

Rehabilitation of anterior long span edentulous area with resultant bone loss creates an unfavourable situation for fixed prosthesis as it results in poor long-term prognosis of the abutment teeth. In these situations, removable prosthesis has other problems such as poor stability, poor retention & poor comfort for the patient even implant prosthesis will need added pre-prosthetic surgery for bone augmentation.

In these cases, Andrews Bridge which is fixed removable prosthesis proves a favourable treatment option. It has many advantages such as hygiene can be maintained by the patient, the masticatory load can be transferred to the abutment teeth, and excessive bone loss can be corrected esthetically with the removable partial denture base. It does not alter the phonetics of the patient

& is also economical. It is a very stable prosthesis & also shows good tissue response. The removable part can always be relined or remade in future. Its hygiene can be easily maintained by cleaning the intaglio surface of the removable part & using cotton or gauze piece for the bar assembly. It can also be used in cleft palate cases with anterior ridge defect [6, 7]. Depending upon the area of bar attachment two types of Andrews Bridge are:

- Pontic supported Andrew's bar system.
- Bone anchored or implant supported Andrew's bar system [4, 5].

Appropriate case selection & designing needs to be done for

Andrews bridge prosthesis as, pontic area requires sufficient thickness of material to avoid fracture of solder joint. If oral hygiene is not maintained, Andrews Bridge causes proliferation of soft tissue therefore pattern should be evaluated before casting [8]. Casting assembly directly to the retainers prevents failure or fracture in the bar. Incidence of fracture and wear in the pontic area is very much similar to the conventional removable prosthesis [4].

Conclusion

Andrews's bridge treatment being removable on pontic area is easy to clean at same time being fixed it covers abutment and take support from them which helps prosthesis to retain. It is economical, esthetic and functional treatment option compared to other modalities of treatment. Hence, Andrews Bridge can be considered as a minimally invasive treatment option for long span ridge defect cases.

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