CASE REPORT

UNCONVENTIONAL FIXED PARTIAL DENTURE: PROSTHODONTIC REHABILITATION BEYOND BOUNDARIES - CASE SERIES

Dr. Asish Kumar Barui[1] , Dr. Riju Das[1] , Dr. Abhisek Chowdhury[2], Dr. T.K. Giri[3], Dr. S. Mukherjee[4]

ABSTRACT

Loss of tooth is a psychosocial trauma for an individual. It adversely affects normal oral functions and poses a significant cosmetic concern for the patients. Fortunately in modern dentistry there are plenty of options available to replace a missing tooth that vary according to clinical scenario. Due to ease of use and favourable long term results, conventional fixed partial denture represents most popular treatment today. But often we encounter few patients seeking fixed prosthesis with some clinically compromised situations where conventional FPDs cannot be executed. Management of these cases can be done by incorporation of modified techniques in order to achieve ideal aesthetic results meeting the expectations of the patients. This present article describes two such clinical cases where patients were rehabilitated by fixed prosthesis using unconventional approach.

KEY WORDS

fixed prosthesis, maryland, loop connector, aesthetics

ABOUT THE AUTHORS

1. Third Year M.D.S Student
2. Second Year M.D.S Student
3. Professor And Principal
4. Professor And H.O.D

Department Of Prosthodontics And Crown And Bridge
Dr. R. Ahmed Dental College And Hospital, Kolkata

INTRODUCTION

Dental health is an integral part of general health and oral rehabilitation entails the performance of all the procedures necessary to produce healthy, aesthetic and well functioning masticatory system[1]. A variety of factors affecting aesthetics and function motivate patients to seek Prosthodontic treatments. Effective treatment planning depends upon through consideration of patients existing clinical conditions. There are certain cases where a dentist needs to think beyond traditional treatment planning in order to achieve optimal results.

A space in the anterior region of dental arch of a youngster, either due to trauma or congenitally missing is a challenging procedure for prosthodontists as usual treatment options are often inapplicable or inconvenient for an adolescent[2].

This clinical situation may further worsen by existing diastema or drifting of teeth in edentulous space creating a dilemma for the dentist as use of conventional FPD may result in too much wide anterior teeth[3].

CASE REPORT A

A 16 year old female patient was referred to the Department of Prosthodontics, Dr. R. Ahmed Dental College and hospital following orthodontic treatment for cleft lip and alveolus (Figure - 1A) . Patient reported with chief complaint of missing upper front teeth and wanted aesthetic correction of the same with fixed dental prosthesis. Intra oral examination revealed maxillary left lateral incisor with slight buccal defect in gingiva due to cleft alveolus (Figure-2A). After taking relevant radiographs and diagnostic models, patient's treatment plan was discussed. Patient did not want a removable partial denture due to speech problem and loose fitting of her previous prosthesis and a conventional full coverage FPD was not feasible as the IOPAR of the patient demonstrated large pulp chamber. Replacement of missing tooth with implant needed bone augmentation procedure but patient did not agree to proposed surgical treatment plan. So a conservative and minimally invasive Maryland bridge prosthesis was planned to restore the missing tooth. Diagnostic model was prepared and wax up was performed to visualise final outcome. Shade selection was done using Vita classic shade guide.

Tooth preparation was done in such a way so that it remained entirely on enamel layer of the palatal surface of incisor and canine. First ,the centric contact area was reduced

Figure - 1A preoperative extraoral photograph

Figure- 2A preoperative intraoral photograph (after removal of orthodontic wire)

Figure -3A tooth preparation on palatal surface of incisor and canine

Figure - 4A final prosthesis with pink coloured ceramic at cervical region

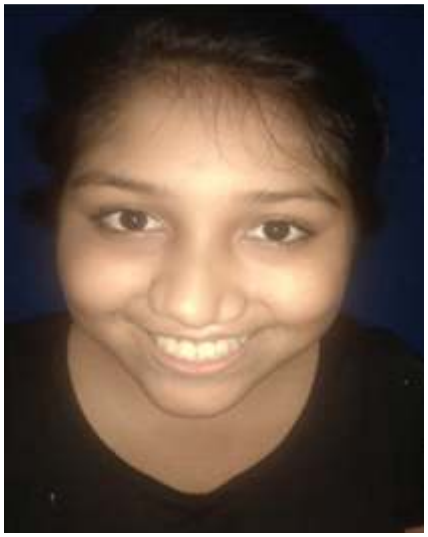

Figure - 5A Post operative intraoral and extraoral photograph


Figure 1B – preoperative extraoral and intraoral photograph

Figure 2B - abutment preparation

Figure 3B - metal try in of the prosthesis


Figure 4B - cementation of loop connector prosthesis

Figure 5B - postoperative extraoral photograph

with a football - shaped diamond bur to get atleast 0.5mm occlusal clearance. Preparation was not extended beyond linguo-proximal line angle and ended 2 mm short from incisal edge. Chamfer finish line was prepared 1 mm supra gingivally. Parallel retentive grooves were made and three counter sink were prepared on the palatal surface of incisors to provide resistance to gingival displacement (Figure - 3A). All grooves were narrow and had flat parallel sides.

Impressions were taken by single step double mix technique using heavy- body and light-body addition silicone (Aquasil, Dentsply ,India) and sent to the laboratory. A metal framework with 'wings' extending on to the preparation was fabricated. Minimal interferences were removed during metal try in. The finished final prosthesis showed pink coloured ceramic at cervical region of pontic to compensate the soft tissue defect resulting from cleft (Figure-4A). The surface treatment of metal frame work was done by electrolytic etching to provide micromechanical retention. Etching was done using 3.5% solution of nitric acid with a current of 250 mA / cm^2 for 5 minutes followed by immersion in 18 % hydrochloric acid solution in an ultrasonic cleaner for 10 minutes. Trial fitting of prosthesis was done (Figure-5A) and the abutment teeth were then prepared for final cementation. The prepared surface was cleaned with pumice and water. Isolation was done using rubber dam and the prepared surface was acid etched with 37% phosphoric acid for 30 seconds. The abutment preparation was washed thoroughly with water and then air dried. Resin cement (IvoclarVivadent, Schaan, Liechtenstein) was used for cementation procedure. A microtip brush was used to apply the primer on prepared surface. A gentle stream of air was applied to evaporate the volatile substances, leaving a glossy surface. The two sripes of paste were mixed uniformly onto the mixing pad and a thin bubble free layer of paste was applied to the retainers. The restoration was seated with firm finger pressure, excess material was removed using a explorer and light curing was done for 10 seconds. Occlusion was verified in centric and eccentric positions and there was no interference. Post cementation instruction was given and patient was followed up at regular intervals.

CASE REPORT B

A 27 year old female patient reported to the Department of Prosthodontics, Dr. R. Ahmmed Dental College with missing left maxillary central incisor and wanted replacement for the same. On examination there was generalised spacing between maxillary anterior teeth (Figure-1B). Anterior edentulous space was around 11-12 mm. Patient was not willing for removable partial denture but a conventional fixed partial denture could not be planned without orthodontic correction of large space. Single tooth implant was an alternative but patient was not willing for any surgical intervention. So considering the conditions a loop connector fixed partial denture replacing the anterior tooth while maintaining the diastema was planned.

First of all informed consent was taken from the patient. Diagnostic impressions were made using alginate (Algitex, DPI , Mumbai, India), impressions were poured using type 3 dental stone (Kalstone, Kalabhai Karson Pvt Ltd. , Mumbai, India) and mock up was done on working cast. Shade was selected using vita classic shade guide. Tooth preparation was done in relation to right maxillary central incisor and left maxillary lateral incisor in conventional manner with equigingival finish line (Figure-2B). Final impression was made with single stage double mix putty light body rubber base impression material (Aquasil, Dentsply, India) and poured in type IV dental stone (Neelkanth Healthcare PVT. LTD. Jodhpur, India). The frame work design was outlined on the maxillary cast. Wax patterns were prepared over the abutment tooth and the palatal loop connecting the pontic to the retainer were made with inlay wax. Care was taken to place the loop away from the rugae. The whole pattern was casted. Metal try in was done in next appointment to ensure proper fit and lack of palatal tissue impingement (Figure-3B). It was send to the laboratory for ceramic build-up. After adjustment finally prosthesis was cemented (Figure - 4B & 5B) using glassionomer luting cement (3M ESPE, Seefeld, Germany). Patient was instructed to maintain oral hygiene and was advised for regular follow-ups.

DISCUSSION

Replacement of missing tooth in young adolescent preclude the use of conventional fixed prosthesis due to large pulp chamber and expected transition in the position of gingiva[4]. Although resin bonded restorations have compromised retention and short life span; it presents with several pros like minimally invasive preparation, no need of anaesthesia, less time consuming, supra gingival finish line which are not deleterious on periodontium. The initial designs of etched cast retainers included an “interproximal wraparound” concept developed to resist occlusal forces and provide a broader area for bonding. Enamel preparations consisted of creating occlusal clearance , placing occlusal /cingulum rests, and lowering the lingual and proximal height of contour , thus creating proximal extensions. With the advent of new adhesive system longevity of restoration allow them to be in service for intended period[5].

Loss of anterior teeth with existing diastema is a challenging task for dentists to ensure aesthetic rehabilitation. Conventional FPD in excessive mesiodistal pontic space results in over contoured prosthesis. Although dental implant can be a viable option but many patients can't afford such elite treatment. Use of loop connector in such cases is now

well documented[6]. It enhances natural appearance of restorations as well as maintains spacing and proper emergence profile. The axial alignment of right central incisor with respect to left lateral incisor and occlusal plane are corrected by this prosthetic design. It is also used to splint pathologically migrated tooth. Apart from several advantages, presence of palatal loop may interfere in speech and act as food trap for the patient. In case of limited interocclusal clearance or deep bite situation the loop connector design may interfere with maximum intercuspal position (MIP). So meticulous design is important keeping the connector round and small in size to ensure patient's comfort.

CONCLUSION

In conclusion it can be said that dental implants or tooth supported conventional fixed partial denture may be the first line treatment options but there are some conditions like large pulp chamber, unwillingness for surgical procedure, periodontally compromised teeth that comply to shift the treatment option from dental implant or tooth supported conventional fixed partial denture to unconventional fixed dental prosthesis. In the above cases two treatment modalities are discussed to restore aesthetic and function in unconventional way.

REFERENCES

1. Ghimire N (2013) Oral Health - An Integral Part of General Health. J Mass Communicat Journalism 3:e138. doi:10.4172/2165-7912.1000e138

2. M. Miettinen & B. J. Millar - A review of the success and failure characteristics of resin-bonded bridges, BDJ volume 215, page E3 (27 July 2013)

3. Shenoy K, Sajjad A. - Anterior loop connector fixed partial denture: A simple solution to a complex prosthodontic dilemma. J Indian Prosthodont Soc 2008;8:162-4

4. Tylman's Theory and Practice of Fixed Prosthodontics. 8 th ed. St Louis: Ishiyaku Euroamerica Inc; 1989

5. Dr Una Lally; Resin-bonded fixed partial dentures past and present - an overview; Journal of the Irish Dental association. 2012;58;294-300

6. Kamalakanth S and Arbaz S. “Anterior loop connector fixed partial denture: A simple solution to a complex prosthodontic dilemma”. Journal of Indian Prosthodontic Society 8 (2008):162-164.

