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ANTERIOR LOOP CONNECTOR FIXED PARTIAL DENTURE AS AN INNOVATIVE AESTHETIC PROSTHETIC TREATMENT APPROACH–A CASE REPORT

Alok Dwivedi*[1]
[1]Department of Prosthetic Dental Sciences, Faculty of Dentistry, Najran University, , Saudi Arabia.
Corresponding author*: Alok Dwivedi*Department of Prosthetic Dental Sciences, Faculty of Dentistry, Najran University, Saudi Arabia.**Email- dralokprosthodontist@gmail.com**

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In modern society, there is a heightened emphasis on aesthetics and physical appearance, with social media playing a significant role in shaping perceptions. Among many complex prosthodontic situations posing difficulty in obtaining optimum esthetics, rehabilitating the anterior region, especially in cases with diastema, presents a complex prosthodontic challenge with regards to prognosis in terms of maintenance of tissue health in that region as well as achieving aesthetics. Different treatment modalities such as implant supported prosthesis, conventional fixed partial denture and removable partial denture are available for treatment of such a patient. Problems arise when we encounter a situation with large midline diastema with generalized spacing and missing anterior teeth. Such a situation poses difficulty to restore satisfactory esthetics. This case report presents a clinical situation with excessive diastema space and missing anterior teeth with generalized spacing which has been successfully restored with loop connector fixed partial denture to restore desired aesthetics.

Keywords*:* Diastema, loop connector, Aesthetics, Implant

INTRODUCTION

Edentulous situation due to loss of an anterior tooth earlier in the age not only affects the esthetics but can also causes psychological trauma to any individual. The situation is complicated by the presence of large diastema coupled with generalized spacing. Restoration by Implant prosthesis is the treatment of choice followed by conventional fixed partial denture[1,2.] Restoration with implant prosthesis is the best treatment option for such scenario but most often it is not a financially viable option for many patients apart from being a complex treatment procedure[3]. Conventional fixed partial dentures on the other hand do not restore satisfactory aesthetics. Fixed partial dentures with modified connectors ie loop connectors can provide best esthetics, superlative function with best occlusion and felicitous emergence profile in the anterior region with a restoration of long-term stability.[4] In this clinical case report, a technique to fabricate 4-unit FPD with loop connector is described in maxillary anterior region to restore esthetics with diastema in a patient with missing central incisors.

CASE REPORT

A 24-year-old male patient reported to the Department ofProsthetic Dental Sciences, faculty of dentistry, Najran University, Kingdom of Saudi Arabia. The chief complaint of patient was poor aesthetics and compromised phonetics due to missing both central incisor teeth in anterior maxillary region of mouth since past 10 months. The patient reported of having met with a vehicular accident leading to fracture of both maxillary central incisor teeth. The clinical examination revealed a wide edentulous area in the region of missing central incisors. Generalized spacing was present in the maxillary anterior arch (Fig.1). A radiological assessment of the edentulous region revealed significant alveolar bone resorption creating a defect that complicated the restoration of aesthetics satisfactorily. No relevant medical history was presented by the patient. Being anterior teeth involved, the aesthetics was of primary concern to the patient. The patient was informed about the available treatment options of Implant prosthesis, conventional fixed partial denture and removable partial denture. Patient belonged to

middle socioeconomic strata, was unable to afford implant restoration. The conventional fixed partial denture in this particular case wouldn't have provided the best possible aesthetics. Considering every aspect and discussion with patient, fixed partial denture with loop connectors was finally planned. A 4-unit porcelain fused to metal fixed partial denture using lateral incisors on either side with loop connectors between 12, 11, 21 and 22 was finalized and planned. Complete treatment procedure was explained to the patient and a written consent was taken from him.**Procedure-(Clinical and Laboratory)**

First Appointment- The diagnostic radiograph was taken and maxillary and mandibular impressions were made to prepare diagnostic casts. The diagnostic casts were articulated on mean value articulator, wax mockup was done and presented to the patient to evaluate his possible aesthetics with the final restoration. After the approval from the patient, teeth 12 and 22 were prepared following routine principles of tooth preparation for porcelain fused to metal crown (Fig.2).Gingival retraction procedure was performed using retraction cord and final impression of prepared teeth was made using polyvinyl siloxane impression material employing putty wash technique (Fig.3). The impressions were poured using die stone. Inter-occlusal bite registration was done using a polyvinylsiloxane bite registration material. Die cutting was done precisely using Pindex system creating precise, removable dies from a master cast to allow for accurate fabrication of restoration. The master casts were mounted on a semi- adjustable articulator using face-bow transfer. Wax copings with about 1.5-2mm loop connectors with round cross section were prepared using Blue Inlay Wax (Fig. 4, 5). A sophisticated approach was employed during the prosthesis fabrication, where strategic spatial considerations were i mplemented to optimize aesthetics and oral hygiene. Specifically, precisely dimensioned spaces were created into the palatal aspect of the restoration. These spaces accommodated the placement of retention loops, which were carefully positioned approximately 1-1.5 mm apical to the free gingival margin to ensure discreetness and prevent visual compromise.Furthermore, a relief of 0.5 mm was maintained between the mucosal surface and these retentive elements. This precise clearance was established to mitigate the risk of mucosal impingement and to facilitate effective oral hygiene maintenance, thereby enhancing the long-term comfort of the final prosthesis. Metal coping try in was performed on patient and all interferences were removed in centric and eccentric movements. Definitive prosthesis was fabricated by porcelain layering in incremental way ((Fig. 6, 7). Final loop connector fixed partial denture was tried in patient's mouth, needed occlusal corrections were done and prosthesis cemented. (Fig. 8)

Fig. 1. Patient with Large edentulous space

Fig 2. Prepared teeth

Fig. 3. Putty wash Impression

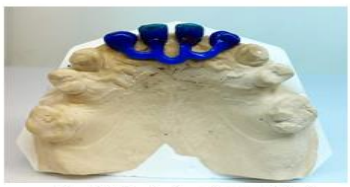

Fig. 4. Wax Coping (Palatal View)

Fig. 5. Wax Coping (Frontal View)

Fig. 6. Finished Prosthesis (Palatal view).

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Fig. 7. Finished prosthesis


Fig. 8. Cemented Prosthesis

DISCUSSION

Anterior missing teeth with large diastema can be best done with implant prosthesis at the same time more

financially viable and less invasive treatment modalities like removable partial denture (RPD), resin bonded fixed partial dentures and conventional fixed partial dentures are available[5]. In the present case patient dropped out the treatment with implant prosthesis due to financial limitations. The alternative treatment options such as resin bonded prosthesis, and conventional fixed partial dentures were deemed unsuitable because the

excessive mesiodistal space and generalized anterior spacing would not yield satisfactory aesthetic results. In this case, the loop connector fixed partial denture would have provided the desired esthetics[6, 7]. This specific prosthesis design features lingually positioned loop connectors that link the adjacent retainers and pontics. The loops are cast from sprue wax which has circular cross section. The prefabricated sprue wax provides uniformity of thickness to loops. This has to be kept in mind since being placed on the lingual aspect, a non-uniform or excessively thick loop can irritate tongue and as a result could be source of agony to the patient[8]. In the present case, the loop connector fixed partial denture solved the problem of esthetics arising due to excessive mesio-distal width pontic space at the same time corrected the problem of generalized spacing present in the anterior segment.

A key consideration for prostheses incorporating loop connectors is their non-self-cleansing nature. Consequently, patients must be thoroughly instructed in, and encouraged to perform, meticulous oral hygiene to ensure optimal oral health. This hygiene maintenance is simple to implement. The selected prosthesis design successfully mitigated aesthetic issues arising from excessive mesiodistal pontic space, thereby correcting generalized anterior spacing[9].

The main drawback attached to loop connectors is their inherent design structure and if thickness is not controlled then they can become source of irritation to tongue which can be annoying to patient. Therefore, their thickness must be optimally controlled to maintain structural integrity of the prosthesis and comfort of patient. Hence it is recommended to keep the loop connectors as small as possible with no sharp angles[10].

CONCLUSION

The loop connector fixed partial denture is an innovative approach that fulfils the patient's aspirations and expectations without afflicting his/her finances. In this clinical case report esthetic replacement of missing anterior teeth by loop connector fixed partial denture was successfully accomplished that provided satisfactory prosthetic

rehabilitation and preserving existing diastema as well[11]. The technique proved successful as the patientwas very delighted and satisfied with the final outcome of the treatment.

DECLARATIONS

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Competing Interests

The authors have no competing interests to declare.

Ethical Approval

The study was approved by the appropriate ethics committee and conducted according to relevant guidelines and regulations.

Informed Consent

Not applicable.

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