

Loop Connectors: An Approach Towards Aesthetics By Maintaining Spaced Dentition

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Abstract:

Patient with generalized anterior spacing (Natural diastema) present problems, as the increased mesio-distal space makes it difficult to give normal fixed prosthesis with rigid connector. Uniform diastema present before extraction may result in excessive width of the pontic space and wider pontic can generate undue forces over retainers which may leads to failure of prosthesis and also it's very unesthetic to look at in the esthetic zone. This is a challenging clinical situation for the prosthodontist if an implant-supported prosthesis is not possible or not selected as a treatment option; loop connector fixed partial denture may be the best solution to maintain the spacing and esthetics. This case report has been describing the procedure of replacing missing anterior teeth with loop connector fixed partial prosthesis while maintaining diastema^[1].

Keywords:- Loop connector, Diastema, fixed partial denture, esthetics

Introduction:

Replacing single or multiple teeth in the esthetic region has always been considered a Prosthodontic challenge especially when it is associated with increase in mesio-distal width which is more than the space to be replaced by tooth^[1].

Connectors are the components of the fixed partial denture that join the retainers and the pontics together, are of two types: rigid and non rigid. Loop connectors are non-rigid connectors which are required when an existing diastema is to be maintained in a planned fixed prosthesis. Drifting of teeth into the edentulous area may reduce the available pontic space; whereas a diastema existing before extraction may result in excessive mesio-distal width in the pontic space. In these situations, the simplest approach to maintain existing diastema is using loop connector. These connectors consist of a loop on the lingual aspect of prosthesis that connects the adjacent retainer and/or pontic. This article presents two case reports where the missing anterior teeth were replaced with a fixed prosthesis, incorporating loop connector.

Case report:

A 48 year old patient reported to the department of prosthetic dentistry and implantology, career post graduate institute of dental sciences with the chief complaint of missing teeth in his upper front left region of jaw since 3-4 years and wanted to replace them with fixed teeth.

Intra oral examination revealed missing maxillary left central incisor with supraeruption of maxillary right central and left lateral incisor along with mandibular incisor with large mesio- distal space between the maxillary right central incisor and left lateral

incisor (fig 1).



Figure 1: intraoral view of patient

Patient had undergone trauma three years back and lost his front teeth and had no relevant dental and medical history

Treatment Options:

An implant was the viable alternative treatment as patient was having good amount of bone support but patient was willing for immediate fixed prosthesis rather than a implant, hence loop connector fixed partial denture was planned to replace the missing teeth by utilizing 11 and 23 as an abutments and also to maintain the diastema.

Procedure:

Primary impression were made using irreversible hydrocolloid impression material (Zelgan 2002 alginate, Denstply) for making of diagnostic cast, and cast was mounted on semi-adjustable articulator after face bow transfer (Hanau wide view, whip mix articulator) After radiographic evaluation root canal treatment were carried out irt, 11, 23, 31 and 32 to achieve a sufficient vertical space as teeth were supra

erupted and patient was having insufficient space to replace missing teeth.

Tooth preparation irt. 11, 22, 31 and 32 was carried out to receive porcelain- fused-to-metal crowns with sub-gingival finish line (Fig.2, 3).

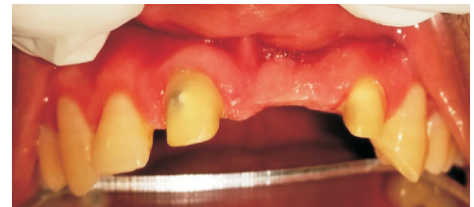


Figure 2: tooth preparation irt 11 and 22



figure 3: tooth preparation irt. 31, 32

Margins were properly retracted using (Fgm Pro Retract Gingival Retraction Cord) and the impression was made by putty wash two step impression technique (Photosil, DPI soft putty/light body-set) followed by fabrication of Provisional restoration using (Tooth Moulding Powder Selfcure DPI) and was cemented with zinc oxide eugenol free cement (Prime Template.) (Fig 4)



Figure 4: provisional restoration irt 11, 21 and 22

Wax pattern was made on master cast and metal try in was done. The thickness of the loop was around 2- 3mm with a relief provided by using 0.2mm relief wax. Metal try in was done after casting of wax pattern (fig 5& 6).

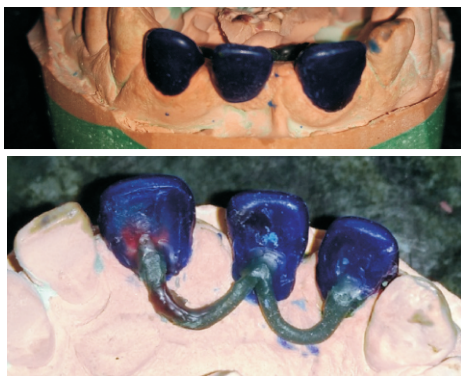


Figure 5: fabrication of wax pattern with loop connectors irt 11, 21 and 23



Figure 6: finished metal coping for try in patients mouth

A fixed PFM partial denture with a loop connector was fabricated and cemented to restore function and esthetic while maintaining diastema (Fig.7).



Figure 7: definitive prosthesis irt 11, 21 and 22

Discussion

A fixed partial denture with loop connector, consists of a loop on the lingual aspect of the prosthesis that connects adjacent pontic to retainers. The choice of material for fabrication of prosthesis is either using sprue wax or can be shaped from platinum gold- palladium (Pt-Au-Pd) alloy wire that is circular in cross section^[2]. Designing prosthesis is important aspect as it contains loop connector and is more prone for plaque accumulation, the connector should have some space between loop and gums to maintain hygiene condition of patient. The size, shape and position of connector affect the success rate of the prosthesis^[3]. Loop connector FPDs and spring cantilever FPDs are types of Resin bonded FPD. The palatal connector in spring cantilever FPD can be a choice when the posterior teeth are healthy and sound; they are used as abutments to replace a maxillary anterior tooth with diastema^[4]. In Photoelastic analysis it is revealed that within the connector, the maximum stress was occur at the gingival region of the loop connector and the minimum in the middle of the connector. Also, the strength of connector depends upon geometry of loop connector. However, finished and polished, less angled and more round connectors should be kept for lower stress levels^[5].

Loop connects the pontic to a posterior tooth or teeth requiring full coverage crowns. Although in a rare instance healthy and sound, posterior teeth have been used as abutments to replace a maxillary anterior tooth with diastema, using a resin bonded spring cantilever fixed partial denture. The long palatal connector in spring cantilever fixed partial denture may deform, if thin, and produce coronal displacement of the pontic; it may interfere with speech and is often poorly tolerated. For these reasons this design is seldom used.

The incorporation of a loop connector in this design allowed the patient to be given an excellent esthetic outcome without compromising the functionality of the restoration. Thus, loop connectors have several advantages when it comes to the esthetic appearance^[6,7].

Conclusion:

The loop connector FPD not only addressed the problem of excessive mesio-distal width

pontic space, but it also corrected the axial alignment of the right central incisor and the occlusal plane with respect to the left lateral incisor. It is also easy to clean and maintain. The connectors should not be overtly thick and should have an intimate contact with the underlying mucosa; otherwise, there are chances that the patient may develop the annoying habit of pushing the tip of the tongue into the gap between the loop and the mucosa.

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