

## Anterior Loop Connector Fixed Partial Denture: A Simple Solution to a Complex Prosthodontic Dilemma

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**Abstract:** Drifting of teeth into the edentulous area may reduce the available pontic space; whereas a diastema existing before an extraction may result in excessive mesio-distal width to the pontic space. Although rarely used, loop connectors are sometimes required to address this problem of excessive mesio-distal width pontic space. The loop may be cast from sprue wax that is circular in cross section or shaped from platinum-gold-palladium (Pt-Au-Pd) or Nickel Chromium (Ni-Cr) alloy wire. Loop connectors offer a simple solution to the above mentioned dilemma, involving an anterior edentulous space albeit with the maintenance of the diastema. This article describes the procedure for the fabrication of a loop connector fixed partial denture to restore an excessively wide anterior edentulous space in a patient with existing spacing between all the maxillary anterior teeth.

**Keywords:** Anterior edentulous space, diastema, loop connector, spring cantilever fixed partial denture.

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## INTRODUCTION

A variety of factors affecting esthetics may motivate a patient to seek prosthodontic treatment. While the restoration of maxillary anterior teeth can tax the creative ability of the dentist, any dental procedure can have esthetic repercussions. An unusually wide or large restoration will not only affect occlusal function but will also produce an unnatural appearance.[1] 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 to the pontic space [1]. In these situations, the simplest approach would be to maintain the existing diastemata. Although rarely used, loop connectors are sometimes required to address this problem of excessive mesio-distal width pontic space.

## CASE REPORT

A 28-year-old female patient reported to the Department of Prosthodontics, with a missing left maxillary central incisor (Figure 1).The anterior edentulous space was large, there was generalized spacing between all the anteriors. The right maxillary central incisor was tilted mesially and the left lateral incisor was above the occlusal plane with an open bite relationship. A conventional fixed partial denture could not be planned without orthodontic correction of the large space. A single tooth implant was a viable alternative as it would allow a restoration maintaining both the mesial and distal diastemas. However, an implant would entail surgery and a more protracted treatment [2]. But the patient was neither willing for orthodontic treatment and nor surgery for implant placement

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and wanted an immediate fixed alternative for the left central incisor. There were only two treatment options left: 1.) a loop connector fixed partial denture and 2.) a spring cantilever (which is in fact a variation of loop connector) fixed partial denture. However, a spring cantilever fixed partial denture for replacing an anterior tooth while maintaining the diastemas is indicated when a posterior tooth needs crowning as well.[3] It is also difficult to clean and maintain, as compared to a loop connector fixed partial denture. In this case, the patient did not require any posterior crowns and the right central incisor and the left lateral incisor needed certain esthetic corrections. Therefore, it was decided to fabricate a loop connector fixed partial denture with the right central incisor and the left lateral incisor as the abutment teeth, maintaining diastemas between the pontic and the retainers on either side.

**PROCEDURE**

Tooth preparation was done in relation to the right central incisor and left lateral incisor, with slight sub gingival finish line. Retraction procedures were carried out, a polyvinyl siloxanes (Aquasil Soft Putty and Aquasil LV, Dentsply Intl) impression was made using the putty reline technique in a rim-lock

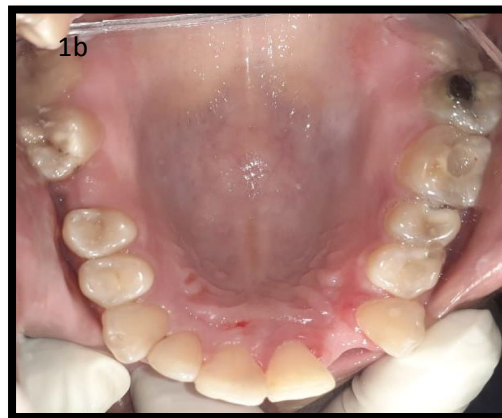
impression tray and removable dies were fabricated. Die ditching was done to expose the restoration margins. As a result, the soft tissue architecture around the abutment dies was lost.

A decision was made to fabricate a soft tissue mask around the removable dies. The impression surface of the final rubber base impression (the same one used for making the removable dies) was first coated with a thin layer petroleum jelly and a light body addition silicon (Aquasil LV, Dentsply Intl) impression material was injected around the abutment dies [4]. Then the final impression was firmly pressed on to the dies. Thus, a soft tissue cast was formed (Figure 2).

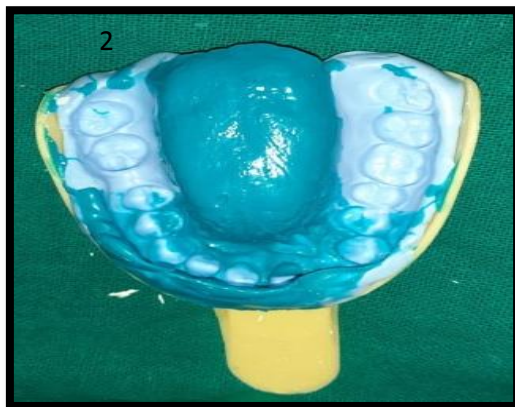
Wax pattern for the retainers were fabricated with blue inlay wax. The palatal loops connecting the pontic to the retainers on the right central incisor and the left lateral incisor were made with round 14 gauge wax. Care was taken to keep the loops away from the rugae. The rest of the laboratory procedures were common with the conventional metal-ceramic FPD construction. Prior to final cementation, the loop connectors were polished to high shine (Figures 3 and 4).



**Fig-1(a): Pre-operative Frontal view**



**Fig-1(b) Pre-op Palatal view**



**Fig-2: Soft putty impression**



**Fig-3: Wax pattern with loop connector**



**Fig-4: Coping trial (Frontal view)**



**Fig-5: Coping trial (Palatal view)**



**Fig-6: Final prosthesis (Frontal view)**



**Fig-7: Post-op patient view**

## DISCUSSION

In a loop connector fixed partial denture, the connector consists of a loop on the lingual aspect of 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 [7]. 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 [8]. For these reasons this design is seldom used. In the above case, 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. The prosthesis that connects adjacent retainers and/or pontic. The

loop may be cast from sprue wax that is circular in cross section or shaped from platinum-gold-palladium (Pt-Au-Pd) alloy wire [5]. The choice is entirely up to the dentist or the dental laboratory. Meticulous design is important to ensure that plaque control is not impeded. As mentioned earlier, a spring cantilever fixed partial denture could have been another less time consuming alternative. The palatal connector in spring cantilever fixed partial denture is a type of loop connector. However, the connector here is a long, thin and resilient bar, closely adapted to the palate so that it is partly supported by soft tissue [6]. It 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[7]. 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 [8].

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## CONCLUSION

Although they are rarely used, loop connectors are sometimes required when an existing diastema is to be maintained in a planned fixed prosthesis, as in the above case. A loop connector FPD offers a simple solution to a prosthodontic dilemma involving an anterior edentulous space, albeit with the maintenance of the diastemas.

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