

## Prosthodontic Management of median diastema using Maryland bridge with Loop connectors

Prachi Chaudhari\*, Aruna Bhandari\*\*, Kanchan Sehwal\*, Sneha Tarle\*

### 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 of the pontic space. In such case rehabilitation of this excessive mesio-distal width is a challenge.*

*This article describes the procedure for the fabrication of a fixed partial denture with loop connector. This type of fixed prosthesis will restore an excessively wide anterior edentulous space in a patient with existing spacing between all the maxillary anterior teeth*

*Loop connector may be casted from sprue wax that is circular in cross section or shaped from platinum-gold-palladium (Pt-Au-Pd) alloy wire. Fixed prosthesis with loop connectors offer a simple solution to the above mentioned dilemma, involving an anterior edentulous space albeit with the maintenance of the diastema.*

**Keywords:** Median Diastema, Maryland Bridge, Loop connector, Anterior fixed Prosthesis, Increased Mesio-distal width.

### Introduction

Replacement of anterior teeth with excessive mesio-distal width due to diastema can often poses a challenging task due to high esthetic demand. Many treatment options like Implant supported fixed partial denture, conventional porcelain fused to metal restorations as well as resin bonded fixed partial denture can also prove quite beneficial, but in cases where excessive mesio-distal pontic space is present, the treatment modality is changed.

A diastema existing before extraction may result in excessive mesio-distal width to the pontic space. In such situations, maximum esthetic results may be obtained if the natural anatomic forms of the teeth are protected. The simplest approach would be to maintain the existing diastema with minimum over-contouring of the adjacent teeth.<sup>[1]</sup>

Such cases can be treated with resin bonded bridges or Maryland bridges. But if median diastema is excessive then Maryland bridge can be modified using non-rigid connector that consists of a loop on the palatal aspect of the prosthesis that connects adjacent retainers and/ or pontics.<sup>[2]</sup>

According to GPT-9, Connectors are the portion of a fixed dental prosthesis that unites the retainer and pontic.

This article presents a case report of prosthodontic rehabilitation of a patient with missing 21 and having excessive mesio-distal space in the anterior region.

### Case Report

A 32 years old female reported to the dept of Prosthodontics & Crown and Bridge, Rural

Dental College, Loni, Maharashtra, with the chief complaint of missing upper and lower anterior teeth and wanted replacement for enhancement of smile. (Fig-1).



On examination, there was missing 21 and 32. The edentulous area for replacement of 21 was more mesio-distally.

The treatment options included an Implant-supported prosthesis, FDP (Fixed Dental Prosthesis), Resin bonded bridge, Maryland bridge modified with loop connectors for missing 21. And an Implant-supported prosthesis or conventional FDP for missing 33. Considering the availability of bone and financial status of

\*PG student, \*\*Prof and Head

### Corresponding author :

Dr. Prachi Chaudhari  
PG student, Dept of Prosthodontics & Crown and Bridge  
Rural Dental College, Pravara Medical Trust, LONI,  
Taluka: Rahata, Dist: Ahemadnagar, Maharashtra – 413736  
E-mail: drprachichaudhari@hotmail.com  
Phone: +919892206106

the patient the option of Implant-supported prosthesis was eliminated. Considering the esthetic requirement of maintaining the diastema between 11 and 21 the treatment option of Marylandbridge modified with loop connector for missing 21 and conventional 3 unit FDP using 31 and 33 as abutments was planned.

The design of Maryland bridge was modified by adding loop connector to metal winged retainers on 11 and 22 to connect the pontic 21.

### Procedure

Maxillary and mandibular diagnostic alginate impressions were made. Wax mock-up was done. Minimum tooth preparation only on palatal surface of 11 and 22 was done. And tooth preparation for full coverage porcelain bridge was done with 31 and 33.

Shade selection was done. Final impressions were made with two stage double mix technique using putty light body rubber base impression material (Aquasil, Dentsply). Impressions were poured in Type IV Gypsum product. Master casts were retrieved. A quick-setting rigid poly vinylsiloxane interocclusal registration material was used to record the maxillomandibular relationship and were transferred on a semi-adjustable articulator using a face-bow record. The provisional FDP was fabricated and cemented using non-eugenol cement.

A 0.5 mm thick wax sheet was placed on the edentulous ridge to create a space to allow convenient access for oral hygiene. Patterns of the modified FDP with loop connectors were fabricated by using blue inlay wax indirectly on the cast, adjusted for optimal occlusal contacts, and contoured to final shape, and form (Fig-2).



The patterns were invested with a phosphate-bonded investment and casting was done using Ni-Co-Cr metal alloy (Wiron 99; BEGO).

After confirming the metal try in, the porcelain (Ceramico 3, Dentsply) was fired according to the manufacturer's recommendations. Pontic was contoured with a fine-grained bur maintaining the diastemas and evaluated for esthetics and residual ridge adaptation. The occlusion was evaluated and adjusted where necessary. After glazing and polishing, the intaglio surface of the retainers was sandblasted using airborne-particle abraded with 50 um Aluminum oxide. Try in was done and interferences if any were removed (Fig-3).



The surfaces of abutment teeth were steam cleaned and the restorations were cemented with Glass Ionomer Cement (Type I luting cement)(Fig-4).



The patient was instructed to maintain the proper oral hygiene. Use of dental floss and interdental brush were recommended. Regular follow-up protocol was done.

### Discussion

Since available existing mesio-distal width in this case was excessive so routine conventional FDP would not have been esthetic. Hence Maryland bridge with loop connector was designed so that the median diastema could be maintained for esthetic rehabilitation.

Since the edentulous mesio-distal space was large in the anterior region, treatment modalities were, Implant supported prosthesis or removable partial denture prosthesis. But the patient was neither willing for implant placement as it would entail surgery and a more protracted treatment nor removable partial denture and wanted an immediate fixed alternative for her missing teeth.

In such cases Resin bonded FDP or Maryland bridge are the better choice as they follow the principles of tooth conservation and aesthetics. This connector has been used not only to manage excessive pontic space but also to splint pathologically migrated teeth. They also provide added advantages like good periodontal health as the finish lines are always supra gingival, requires no anaesthesia, and also economical.<sup>[3]</sup> Loop connector FDP is one of the choice to solve this problem of excessive mesiodistal width of pontic space.<sup>[4]</sup>

In the loop connector FDP, the loop can be fabricated by casting it from sprue wax that is circular in cross section.<sup>[5]</sup>

In this case, the Maryland bridge with loop connector was designed to overcome the problem of excessive mesio-distal width with esthetic pontic.

The thickness of the loop was so designed that there is less interference with tongue movements and phonetics. This prosthesis design may decrease access for plaque removal because palatal connectors are over-contoured and hence was easy to clean and maintain.

It has been documented that if loop connectors are not made overtly thick and have intimate contact with the underlying mucosa, interference in tongue movements and discomfort in speech was a minor problem and is overcome within no time.<sup>[6]</sup>

### Conclusion

The Fixed Dental Prosthesis using loop connectors can serve as an excellent treatment alternative to the prosthodontic dilemma of maintaining existing spaces while replacing anterior teeth. Proper design on the part of the dentist and regular oral hygiene maintenance by the patient are the keys to a successful outcome. This prosthesis resulted in an esthetic result and required minimal adjustments.

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