# LOOP CONNECTORS IN ANTERIOR TOOTH MISSING A CASE REPORT

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## Abstract

In patients with generalized natural diastema and missing anterior teeth the treatment alternatives available are extremely restricted in terms of restoring the edentulous area. The patient experiences discomfort when using a removable partial denture. In the event that implants are not recommended, using a fixed partial denture to replace the lost tooth may cause too broad unsightly anterior teeth. Loop connector is the fixed dental prosthesis that preserves the diastema and delivers the best possible aesthetics to replace lost teeth. In this case report, the rehabilitation of a patient with FPD with a loop connector in the maxillary anterior region—to preserve the diastema for esthetic reasons are described.

**KEYWORDS** - Loop Connectors, Missing Anterior tooth

## Introduction:

The presence of diastema in natural dentition is generally distributed uniformly in dental arches. Missing teeth in such natural dentitions require duplication of diastemas to create an esthetic balance. Spacing between natural teeth results due to the discrepancy between the skeletal and dental volumes in the stomatognathic system. Besides looking unesthetic, spacing of natural teeth may affect the protective function of the dentition, phonetics and facial appearance. Restoring abnormally large edentulous spaces can result in excessive width of pontics which look unnatural[1]. Wider pontics can also generate undue forces over retainers which may lead to failure of prosthesis. The diastema resulting from the missing central incisors can be managed with implant-supported prosthesis or FPD with loop connectors. If implants are not indicated, use of fixed partial denture to replace the missing tooth may result in too wide anterior teeth leading to poor aesthetics. The use of removable partial denture creates discomfort to the patient. Loop connector is the fixed dental prosthesis replacing the missing teeth while maintaining the diastema and provide optimum aesthetics. 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) alloy wire. The modified FPD with loop connectors enhanced the natural appearance of the restoration, maintained the diastemas and the proper emergence profile, and preserve the remaining tooth structure of abutment teeth. This clinical report discussed a method for fabrication of a modified FPD with loop connectors to restore the wide span created by missing central incisors. Excessive width of pontic space leaves the clinician in dilemma whether to close the space or to maintain it to simulate the natural appearance in final prosthesis. Various treatment options are available for replacement of single anterior tooth, along with diastema that includes an implant-supported prosthesis or conventional fixed partial denture (FPD) or resin bonded fixed prosthesis. If implant supported prosthesis is not the possible treatment option, FPD along with loop connector may be the best solution to maintain the diastema and provide optimum restoration of aesthetic. This clinical report describes the procedure of replacing missing maxillary central incisor with loop connector fixed partial prosthesis while maintaining diastema. Different esthetic treatment options are available for replacement of single anterior tooth i. e. implant supported restorations as well as FDP or resin bonded fixed partial dentures[1]. It becomes challenging for a prosthodontist in replacement of the teeth in cases of diastema or interdental spacing. The use of a conventional fixed partial denture (FPD) to replace the missing tooth may result in too wide anterior teeth, an over-contoured emergence profile, which results poor aesthetics[2].If implants are not indicated for some reason and patient is not comfortable wearing removable prosthesis. Modified fixed dental prosthesis with loop connectors are a good alternative. The modified FPD with loop connectors enhances the natural appearance of the restoration, maintain the diastema, proper emergence profile and preserve the remaining tooth structure of abutment teeth[3].This case report describes a technique to fabricate a three-unit FPD to rehabilitate a patient with missing maxillary right central incisor along with spacing in the maxillary anterior region. The most conservative treatment of such edentulous spaces is an implant supported prosthesis, but due to high cost, time consuming and medical factors treatment of spaces is not popular in dental practice[4].

## Case report:

A 35-year-old male patient came to the Department of Prosthodontics, with the chief complaint of missing upper front tooth due to trauma to upper front teeth 1 year ago. The patient had no notable extraoral or intraoral anomalies, with the exception of the missing upper front tooth and widespread spacing in the maxillary anterior region. The patient's medical, social, and substance histories did not significantly impact his current state of health. On intraoral examination, the maxillary right central incisor was missing and a wide mesiodistal gap between the maxillary left central incisor and the maxillary right lateral incisor was noticed. The space available to replace the missing tooth was more than the estimated width of the adjacent central incisor.

## Treatment options:

An implant-supported prosthesis, FPD with loop connectors, or a removable partial denture can be used to address the diastema resulted by the lost central incisor. Although an implant was a possible treatment option, it was not advised because of insufficient bone support. When a fixed partial denture is used to replace a missing tooth, the anterior teeth may become too broad, which can have a negative visual

impact. The treatment option of 03 units porcelain fused to metal FPD from 12 to 21 with intermittent loop connectors between 11, 12, 21 was planned in consideration of the patient's aesthetic need of retaining the diastema between 11, 12 and 21. The patient was given a thorough explanation of the treatment plan, and his consent was obtained.

## Procedure:

The prosthetic treatment commenced with making a diagnostic impression using an irreversible hydrocolloid (Thixotropic, Zhermach, Italy) and type 3 dental stone was poured into it. After that, a diagnostic wax up was done to fabricate a loop connector fixed partial denture maintaining diastema. Diagnostic wax up aids in edentulous space analysis, patient motivation, and education. Following oral prophylaxis in its entirety, tooth preparation for PFM crowns was carried out on teeth 12 and 21. The chemico-mechanical approach was used to perform gingival retraction. Using a two-stage putty wash process and polyvinylsiloxane impression material, the final impression was made. Using tooth-colored autopolymerizing PMMA, provisionals were fabricated. Master cast was poured with type 4 gypsum products. Wax up was completed on 12, 21 for the PFM crown, and two loops linking the two abutments were connected on the palatal aspect using sprue wax. For marginal adaptation and framework passivity, metal try-in was initially performed on the cast and subsequently on the patient. Shade selection was carried out in natural light, and ceramic build-up was completed. The final prosthesis was cemented using type 1 glass ionomer cement. An assessment of oral hygiene maintenance was conducted as part of the patient's routine follow-up. The patient was pleased with the loop connector FPD's results, both functionally and aesthetically.

## Discussion:

A fixed partial denture with a loop connector, consists of a loop on the lingual aspect of the prosthesis that connects adjacent pontic to the retainers. 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 the patient. The size, shape and position of the connector affects the success rate of the prosthesis[5]. Maximum esthetic results may be only if the natural anatomic forms of the teeth are protected and the diastema is maintained. Other available options are implants and removable partial denture but loop connector fixed partial denture is used in cases of excessive mesiodistal width of pontic space when fixed partial dentures are planned. In a loop connector the loop may be cast from sprue wax either circular in cross-section or shaped from platinum-gold-palladium (Pt-Au Pd) alloy wire. Their should be adequate thickness of the connector to prevent deformation but not so much that it becomes conspicuous to the tongue[6]. 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. The presence of missing central incisors with a wide diastema is a challenging situation for a prosthodontist. To aesthetically rehabilitate such cases fixed dental prosthesis with loop connectors is a good aesthetic alternative to implants, or conventional fixed dental prosthesis[7]. Modified fixed dental prosthesis with loop connector improves aesthetics, emergence profile, maintains diastema and also follows principles of golden proportion[8]. The connector here is a loop, closely adapted to the palate so that it may partly gain support from the soft tissue[4].It connects the pontic to the abutments. The use of loop connector can also be termed as a form of physical

characterization of the fixed partial denture since the connector is modified and passed behind the soft tissue so that it is not visible to the naked eye when a patient speaks or smiles. The patient was instructed to maintain proper oral hygiene. Use of dental floss and interdental brush were recommended. The patient was evaluated after one week to assess the oral hygiene status. Disadvantages of loop connector includes additional laboratory procedures, difficulty in maintaining oral hygiene, interference with tongue and discomfort in speech[9]. However, these disadvantages can be minimised by keeping the connectors round and small in size.

**Fig 1: PREOPERATIVE VIEW**

**Fig 2: VITAL TOOTH PREPARATION**

**Fig 3: METAL TRY-IN FACIAL VIEW**

**Fig 4: METAL TRY-IN OCCLUSAL VIEW**

**Fig 6: COMPLETED RESTORATION**

**(Facial View)**

**Fig 7: COMPLETED RESTORATION**

**(Palatal View)**

**Fig 7: FINAL PROSTHESIS**

**Fig 8: PALATAL VIEW**

## Conclusion:

Although loop connectors are not commonly used, but it serves as an excellent alternative treatment option in cases with diastema and interdental spacing. It required when an existing diastema is to be maintained in a planned fixed prosthesis, as in the above case. This prosthesis had an esthetic result and required minimal adjustments.

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

This case described the incorporation of a loop connector with the fixed dental prosthesis in patient with missing central incisor with excessive edentulous space. with this prothesis replacement of the missing teeth was done along with maintaining the midline diastema. There was marked improvement in aesthetics of the patient. Patient was highly satisfied with the result.

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