Esthetic Rehabilitation of Missing Anterior Tooth using Loop Connectors to Maintain Midline Diastema: A Case Report

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Loss of anterior teeth in patients with diastema presents a great esthetic challenge for the prosthodontists. In cases with midline diastema and interdental spacing, the option of a conventional fixed partial denture becomes impossible to use. This is because of the excess space available for pontic, which makes the incorporation of the diastema in the planned prosthesis, a compulsion. Diastema closure in such cases with the help of conventional fixed partial denture is bound to result in esthetic failures. This article presents a case of midline diastema successfully maintained by lingual loop connectors between the pontic and the retainers to achieve esthetic rehabilitation in the mandibular anterior region.

Keywords: Diastema, Esthetic rehabilitation, Loop connector

INTRODUCTION

Replacing a single tooth in the esthetic region has always been as a challenge for the clinician. Loss of an anterior tooth with existing diastema may result in the excess space available for pontic.¹ In such a clinical situation, the options available for replacement of single anterior tooth are removable partial denture, implant supported prosthesis or conventional fixed dental prosthesis.² During history taking, patient’s medical, social and drug history were non-significant, whereas dental history revealed avulsion of mandibular left central incisor due to blunt trauma from ball injury two years ago. The avulsion injury also resulted in the mesial migration of the tooth 41 resulting in the shift of the mandibular midline to the left side.

However, in certain conditions, the spacing is seen involving the whole esthetic zone and thus maintaining it becomes an endeavor of the rehabilitative procedure. In order to maintain the diastema in fixed prosthesis with loop, connector is the best treatment option available.³⁴ This approach enhances the natural appearance of the restoration, maintain the diastema and proper emergence profile.⁴ This clinical report describes a technique to fabricate three unit porcelain fused to metal fixed dental prosthesis with lingual loop connectors to achieve an optimal esthetic and functional correction for patient with missing mandibular central incisor.

CASE REPORT

A 23-year-old male patient reported to the Department of Prosthodontics with a chief complaint of fixed replacement of missing left mandibular central incisor. On examination, the left mandibular lateral incisor and right mandibular...
central incisor were vital with good periodontal support. The edentulous area was wide mesiodistally and there was spacing between existing anterior teeth (Figures 1-3).

The treatment options include a removable partial denture for which the patient was not compliant, implant supported prosthesis was ruled out due to economic reasons and fixed partial denture with the aid of loop connector in order to maintain the diastema was considered. Considering the patient’s economic status and esthetic requirement of maintaining space between the mandibular anterior teeth, the treatment option of three unit porcelain fused to metal fixed partial denture with intermittent loop connector was planned.

Clinical Procedure
The proposed treatment plan was discussed with the patient and a mock wax up was shown to the patient. After taking his consent, the clinical procedures were initiated. The abutment tooth preparation to receive porcelain fused to metal prosthesis was carried out on right mandibular central incisor and left mandibular lateral incisor with equi-gingival margins (Figure 4). The gingival retraction was carried out with gingival retraction cord, and final impressions was made using elastomeric impression material with two stage double mix technique. An interocclusal record was made using bite registration material (Ramitec). Provisional restorations were fabricated with a tooth colored auto polymerizing acrylic resin and cemented with non-eugenol temporary cement.

The impression was poured in Type IV dental stone (Kalabhai). Master cast was retrieved and die cutting was done. Master cast was mounted on a semi-adjustable articulator using interocclusal record. Wax patterns were fabricated using blue inlay wax. Wax spacer was adapted on the lingual region so that adequate space will be given in the area of loop connectors for the maintenance of oral hygiene (Figure 5). The wax patterns were invested with phosphate-bonded investment material (Bellasun, Bego) and cast in base metal alloy. After confirming the metal try in, the ceramic build-up was done.

Bisque trial was done (Figure 6). Loop connectors were highly polished to a high shine (Figure 7). Final fixed dental
prosthesis with loop connectors was luted using glass ionomer cement (Figures 8-10). The patient was instructed to maintain proper oral hygiene. Use of dental floss and interdental brush were recommended. The patient was evaluated after 1 week to assess the oral hygiene status.

**DISCUSSION**

Connectors are the part of fixed partial denture that connect the retainers with the pontic. They may be either rigid or non-rigid. Conventional fixed partial denture connectors are more rigid as compared to loop connectors. Loop connectors become more flexible, and its flexibility depends upon its length, diameter, and its cross section.  

Indications for loop connector are when the patient wishes to maintain the diastema, presence of excessive pontic space, presence of localized or generalized spacing between abutments.

A Patient with missing central incisor along with diastema have the limited treatment option. Closing the space (diastema) with conventional fixed partial denture without considering golden proportion would fail to create an esthetically pleasing appearance and detrimental effects on the periodontium. The modified fixed partial denture with loop connectors enhance the natural appearance of the restoration, maintain the diastema, proper emergence profile and preserve the remaining tooth structure of abutment teeth.

Disadvantages of loop connectors include additional laboratory procedures, difficulty in maintaining oral
hygiene, interference in tongue movement and discomfort in speech. However, keeping the connectors round and small in size will not affect the phonetics.  

Hence, the advantages of the ability to maintain the diastema, maintaining the ideal mesio-distal dimensions of the abutments as well as the pontic results in the esthetic rehabilitation of the patient and as far as the discomfort is concerned regarding the lingual loops, the size of the loops can be adjusted suiting the patient needs.

This clinical report described the use of loop connector for replacing missing central incisor with existing diastema. Loop connectors maintain the proper emergence profile and enhance the esthetics. It is quite a simple technique considering the desired laboratory procedures involved. The comfort of the loop connectors can be tested at the time of the trial. The phonetics should also be checked so that the patient easily accepts the final prosthesis later. A little planning before the commencement of the treatment can help add to the esthetic quotient of an otherwise typical clinical situation.

CONCLUSION

Treatment planning is crucial to success when considering any form of tooth replacement. Whichever treatment modality is finally selected, it should suit the needs of the patient.

The use of lingual loop connectors presents a simple and easy way to fabricate a life-like prosthesis for the patient. The esthetic advantage of such prosthesis certainly outweighs the presence of the lingual metallic loops in the patient’s mouth.

REFERENCES


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