



LOOP CONNECTOR FIXED PARTIAL DENTURE: AN AESTHETIC SOLUTION FOR MAINTENANCE OF DIASTEMA – A CASE REPORT

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ABSTRACT

Replacement of a single missing tooth with existing diastema in anterior region poses many challenges to the clinician. 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.

KEYWORDS : loop connector, diastema, missing anterior teeth, aesthetic, Fixed Partial Denture, Spacing

INTRODUCTION

Patients with missing anterior teeth along with diastema have limited treatment options to restore the edentulous space. The diastema can be managed with implant supported prosthesis, conventional fixed partial denture or FPD with loop connectors. The use of conventional fixed partial denture to close the diastema without considering golden proportion may result in too wide anterior teeth and an over-contoured emergence profile, which in turn results in poor aesthetics and detrimental effects on the periodontium.^{1,2} In such situation, implant supported prosthesis is the best treatment option provided it is clinically possible. Or else, a modified FPD with loop connectors can also be used which enhances the natural appearance of the restoration; maintains the diastema and proper emergence profile.^{3,4} This article presents a technique to fabricate a three unit FPD with modified palatal loop connector to achieve an optimal aesthetic and functional correction for patient with missing maxillary central incisor along with spacing in the maxillary anterior region.

CASE REPORT

A 20 year old female patient reported to the department of Prosthodontics with a chief complaint of replacement of missing anterior teeth. Past medical history was insignificant and past dental history revealed that patient had lost her teeth due to trauma 1 year back and had generalized spacing in the anterior teeth before the accident. On intraoral examination, 21, 31, 32 and 41 were missing, 23 was in cross bite and 43 was supraerupted (Fig 1). The edentulous area was wide mesiodistally and there were spacing between existing anterior teeth. On radiographic evaluation the abutment teeth had adequate bone support.



Fig-1:preoperative view

All the treatment options were discussed with the patient along with orthodontic correction of spacing in anterior teeth and cross bite in left maxillary canine region, but patient was not willing for pre-prosthetic orthodontic correction. A tooth implant was viable alternative as it would allow a restoration maintaining the diastema, but the patient was not ready to undergo implant surgery and wanted an immediate fixed alternative for the missing teeth. So

considering aesthetic requirement of maintaining space between maxillary anterior teeth, it was decided to rehabilitate this case by porcelain fused to metal FPD with intermittent loop connector for maxillary anterior teeth. Conventional fixed partial denture was planned for missing mandibular anterior teeth as loop connectors are usually avoided in mandibular anterior edentulous area due to anatomic limitations like tongue interference, lingual frenum etc.. The patient was informed about the treatment modality and her consent was taken prior to the treatment.

CLINICAL PROCEDURE

Following clinical procedure was carried out for her oral rehabilitation. Tooth preparation was done for porcelain fused to metal complete veneer with 11,22,33,42 and 43 (Fig 2). The gingival retraction was carried out and final impressions were made using elastomeric impression material by double mix double step technique (Fig 3). An interocclusal record was made using bite registration material.



Fig-2:teeth preparation



Fig-3:final Impression

Provisional restorations were fabricated with a tooth colored auto polymerising acrylic resin and cemented with non-eugenol temporary cement. The impression was poured in type IV dental stone. Master cast were retrieved and die cutting was done. Master cast were mounted on a semiadjustable articulator using a facebow transfer and interocclusal record. Wax patterns were fabricated using blue inlay wax (Fig 4). Wax spacer was adapted on the palate to provide adequate space in the area of loop connectors for the

maintenance of oral hygiene. To ensure optimum rigidity of the connector, length was decreased and half round form of cross section was given.

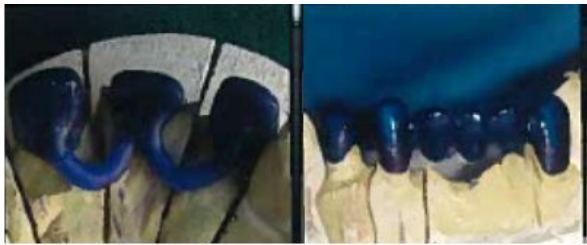


Fig-4: Wax pattern

The patterns were invested and casted in a base metal alloy. Metal try-in was done to verify the proper seating (Fig 5).



Fig-5: metal tryin

Ceramic layering was done for all units. Bisque trial was done to verify the aesthetics. After evaluation the occlusion was adjusted where necessary. Loop connectors were highly polished to high shine. Final fixed dental prosthesis with loop connectors was luted using glass ionomer cement (Fig 6, Fig 7). 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.



[Fig-6]: palatal view of final prosthesis



[Fig-7]: final prosthesis after cementation with loop connectors

DISCUSSION

The presence of the anterior extensive diastema is a difficult esthetic problem to resolve with conventional fixed partial dentures.¹ The spacing between the teeth can be due to genetic causes, high frenum attachment, presence of mesiodens, retained teeth or proclined mandibular teeth⁵. Maximum aesthetic result may be obtained if the natural anatomic forms of the teeth are protected and diastema is maintained with minimal overcontouring of the adjacent teeth. If an implant supported prosthesis is not selected as a possible treatment modality, then the only viable option available to maintain spaces in FPD is with the help of loop connectors, which is both esthetically and mechanically challenging.^{1,3,6} Loop connectors are non-rigid connectors that permit limited movement between otherwise independent members of the fixed partial denture prosthesis⁷. Its flexibility depends upon its length, diameter and its cross section. The size, shape and position of the loop connector are vital for the prosthesis, as it prevents its distortion and fracture^{8,9}. Meticulous designing of the prosthesis is important to ensure that plaque control is not impeded. In addition, it should not

interfere with tongue movement and speech as it will then be poorly tolerated¹⁰. The loop may be cast from sprue wax that is circular in cross section or shaped from platinum-gold-palladium alloy wire. If loop connector is not overly thick and has an intimate contact with the underlying mucosa, interference in the tongue movements and discomfort in speech was a minor problem and is overcome with no time.

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

CONCLUSION

Although loop connector FPD is rarely used, it serves as an excellent alternative treatment option in cases with existing diastema and interdental spacing. Sometime patient might object to the projecting palatal connector which might also act as a potential food trap. If the patient can be motivated to get adapted to it, loop connector FPD offers a simple and excellent solution for cases where excessive mesiodistal pontic space is present. This clinical report describes use of loop connector for replacing missing central incisor with existing diastema to give a good aesthetic outcome for the patient.

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