

Non Familiar Characterization Using A Loop Connection In A Fixed Partial Denture

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Abstract

Among different components of a fixed partial denture, the role of connector is always overshadowed by either features of the pontic or a retainer. The connector is always looked upon in terms of connecting the components of a fixed partial denture. Its roles in esthetics although has been mentioned but its potential to improve the aesthetic appearance of a fixed partial denture has never been discussed. We present a case of an adult female patient who presented with a spacing of maxillary anterior teeth. A conventional fixed partial denture would have resulted in an increased width of individual tooth, which would have not matched her characteristic facial form. The case was successfully restored with a modified fixed partial denture using a loop connector. Periodontal evaluation during diagnosis and follow up proved supportive.

Keywords — loop connector, pontic, retainer, ceramic characterization

INTRODUCTION

Diastema in dentition is referred as the spaces present between the natural teeth. The occurrence of diastema can be temporary or permanent depending upon the stage of development of the teeth.^{1,2} Duplicating the diastema in a fixed partial denture (FPD) is difficult since the presence of connector between various components of an FPD does not allow such modifications. When diastema is present and a natural tooth has to be replaced, the different treatment options available are an implant supported single crown, spring cantilever FPD or an FPD using a loop connector.^{3,4} A recent FPD design based on the resin bonded prosthesis is yet another option.⁵ A conventional FPD without using a loop connector would result in increased mesiodistal width of the prosthetic restoration, thus altering the golden proportion which in turn impairs aesthetics.^{3,6} The advantage with loop connector design is that one is able to maintain occlusal function which in turn makes loop connector a versatile design form since it does not affect abutment health.

This article in the form of a case report presents a case of missing maxillary right central incisor that was successfully restored with a loop connector modified FPD.

CASE REPORT

A young female patient reported to the department of prosthodontics with chief complaint of impaired facial esthetics due to tooth loss. Medical, social and drug history were non contributory. Extra oral examination did not reveal any abnormal feature except increased lower third facial height. Intra oral examination revealed proclined maxillary anterior teeth with wide spacing and a missing maxillary right central incisor. Spacing between natural teeth was present in mandibular arch also. For diagnosis and treatment planning, a preliminary diagnostic impression was made by irreversible hydrocolloid (CA 37; Cavex, Haarlem, Holland) following which the maxillary and mandibular cast were mounted on a semi adjustable articulator (Bioart Bio Art A6 Plus, Brazil) using a meatal type of arbitrary facebow (Hanau, USA). The articulator was programmed using patients interocclusal records (**Fig 1A**). Analysis of the cast in various mandibular movements revealed the contact of the mandibular teeth in the middle third of the palatal surface of maxillary teeth (**Fig 1B**). At this stage, the occlusal contacts were reviewed with a periodontist, for determining the long term health of the abutment. Since the opposing contacts were below the middle third of the crown (close to bone fulcrum), the prognosis of the abutment to support an FPD with a loop connector was considered favorable. After a wax up the treatment options given to the patient included an implant supported single crown restoration, modified FPD using loop connector or a removable partial denture. The patient consented for a three unit fixed partial denture with a modified connector in the form of twin loop connector after proper education regarding the long term esthetic outcome of the prosthesis. The treatment started with the preparation of abutment (**Fig 1C, D**) which was followed by definitive impression (**Fig 2A**) using a combination of putty and light body consistencies of an elastomeric impression material (Reprosil, Dentsply/Caulk; Milford, DE, USA). The working cast was mounted on semi adjustable articulator following which a complete crown wax pattern (Harward, Germany) was fabricated and connected to each other by a loop connector made from 3.5 mm sprue wax (Bego, Wilhelm-Herbst, Germany) (**Fig 2B**).



Figure 1: (A) Programmed articulator with mounted casts (B) Palatal surface of maxillary teeth showing point of contact during protrusion (C) and (D) prepared teeth.

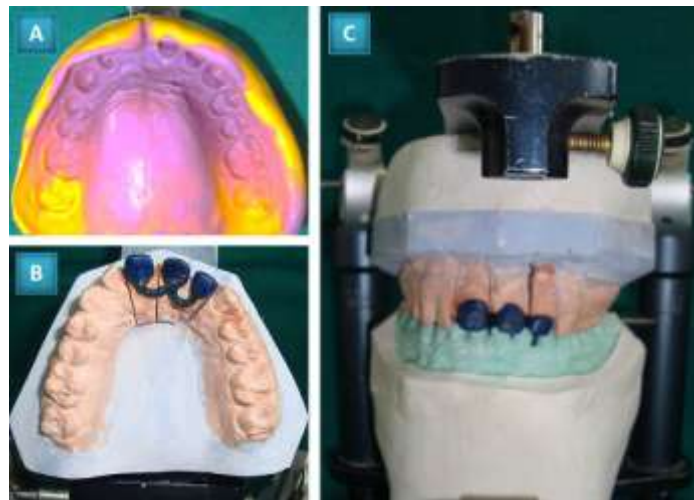


Figure 2: (A) Definitive impression (B) Wax pattern (C) Cut back



Figure 3: (A) Metal framework (B) Glazed porcelain (C) and (D) Cemented restoration (E) Extra oral view of the finished restoration

Cut back on each retainer was done to accommodate the thickness of adequate planned porcelain facing (Fig 2C). A metal trial of the framework was done during the next clinical appointment (Fig 3A), following which dental porcelain was fused and a porcelain trial was done. This was followed by a clinical trial of the porcelain and after adjustment the glazing of the restoration (Fig 3B) was accomplished. The FPD was cemented using zinc phosphate cement (Fig 3C, D). The patient was put on a follow up protocol of within a week, 3 months, six months and one year. The esthetic outcome for both patient and the prosthodontist was extremely satisfying (Fig 3E).

DISCUSSION

Spacing between the teeth is a normal, natural phenomena that in layman terms describe the discrepancy of sizes between the underlying bone and the teeth. The complexity of treating a patient with diastema is not due to lack of prosthetic options that a prosthodontist has but in fact the patient's attitude who is expecting the diastema to be closed in his future prosthesis. But when diastema is closed in a prosthesis, the negative impact it has on aesthetics cannot be gauged by any patient before the treatment is done. Various options within the fixed partial denture designing for such cases includes the use of cantilever fixed partial denture or the spring bridge, conventional fixed partial denture with adjacent connectors and loop connector modified fixed partial denture.^{4,7} The long arm of the spring cantilever fixed partial denture in fact becomes too flexible and easy to get deformed under occlusal pressure especially if the connecting arm is thin.⁸ This feature also does not allow such design to participate in occlusion and if the pontic has to bear the occlusal forces the thickness of the loop has to be increased to impart rigidity which in turn has negative effects on the patient's compliance. Excessively thick palatal connector of spring cantilever fixed partial denture can be annoying to tongue and impair phonetics.

The loop connector on the other hand can be made relatively short and their placement in relation to tongue position is always in the anterior region just beneath the tooth. The form of the loop can be kept

round, even after decreasing the length and increasing the diameter of the loop.⁹

CONCLUSION

A loop connector design allows the clinician to maintain natural esthetic balance by incorporation and duplication of existing diastema within the fixed partial denture. There is no compromise on the rigidity of the prosthesis and patient acceptance can be improved by education and motivation.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the efforts of the laboratory technician during various stages of fabrication of this prosthesis

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