

Case Report

Incorporating Diastema within Artificial Teeth Using the Loop Connector

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Abstract: Excessive partial edentulous space in the region of missing teeth pose challenges in proportioning of dental restorations. 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. An implant supported single crown is a conservative treatment option but patients usually need immediate treatment in such cases, rather than waiting for months. We present a case of a young adult who had lost a maxillary right central incisor due to trauma related periapical infection. Diagnostic wax up on a mounted cast revealed a compulsory incorporation of diastemas within the planned fixed partial denture. Spacing between the three unit porcelain fused to metal restoration was successfully accomplished with the use of a loop connector.

Keywords: pontic, retainer, connector, non rigid connector, fixed partial denture.

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INTRODUCTION

Spacing between natural teeth results due to the discrepancy between the skeletal and dental volumes in the stomatognathic system. Besides looking unaesthetic, spacing of natural teeth may affect the protective function of the dentition, phonetics and facial appearance. Restoring abnormally large edentulous spaces can result in wide restorations which look unnatural (Miller, T. E. 1995). 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 (Bello, A., & Jarvis, R. H. 1997). While an implant supported prosthesis takes more time before it can restore impaired aesthetics, individuals usually prefer an immediate dental treatment in such cases. The preference in relation to treatment being immediate focuses treatment options that are within the scope of fixed partial denture prosthetic options. Conventional fixed partial denture (FPD) has two innovative designs for management of wide edentulous spaces, the spring cantilever FPD and the loop connector FPD (Brar, A. *et al.*, 2014; & Stephen, F. *et al.*, 1995). Spring cantilever is a viable treatment option for low socioeconomic countries

where individuals lack affordable dental insurance treatment options (Kumar, L. *et al.*, 2017).

This article presents a case of a young male patient who presented with a missing maxillary right central incisor with wide diastema. A loop connector modified FPD was fabricated with successful results.

CASE REPORT

A male patient aged 34 years reported to the department of prosthodontics for replacement of missing upper front teeth. The patient had lost his maxillary right central incisor due to infection that in turn was due to trauma to front teeth. With medical, social and drug history non-contributing to existing health, the patient did not have any significant extra oral or intra oral abnormalities except for generalized spacing in maxillary and mandibular anterior region. Clinical picture was that of a Kennedy class 3 partial edentulous situation in the anterior maxilla with increased partial edentulous mesio distal width, suggesting the presence of diastema in maxillary arch also. Treatment options presented to the patient were single maxillary implant supported crown, a modified fixed partial denture that would replicate diastema or a cast partial denture. General preprosthetic mouth

preparation included oral hygiene maintenance program followed by restoration of incipient pit and fissure caries in relation to mandibular first and maxillary second molars. Prosthetic treatment was initiated making a diagnostic impression with irreversible hydrocolloid (Thixotropic, Zhermach, Italy). This was followed by a diagnostic wax up to assist patient education and motivation and analysis of edentulous space. The patient consented for a modified FPD with loop connector after a description of the treatment design on the diagnostic casts. Prosthetic treatment started with tooth preparation for porcelain fused to metal retainers (wing preparations) in relation to maxillary left central incisor and maxillary right lateral incisor (**Fig 1A**). Routine clinical and laboratory

procedures for fabrication of FPD were done. During the wax pattern fabrication with crown wax (Harward, Germany), the three different wax patterns (two for retainer and one for pontic) were attached with each other with a 3 mm round, sprue wax (Bego, Wilhelm-Herbst, Germany) in the form of a loop connecting the retainer and the pontic (**Fig 1B**). The metal framework was tried in the patient's mouth followed by the shade selection. After porcelain firing and fusing a three unit loop connector FPD was cemented with zinc polycarboxylate cement (Poly F Plus; Dentsply DeTrey GmbH, Konstanz, Germany) (**Fig 1C**). The patient was put on regular follow up, during which oral hygiene maintenance assessment.



Figure 1: (a) Tooth preparation of the planned abutment teeth (b) Wax patterns with loop connectors (c) Definitive restoration cemented in place (d) Post operative follow up of the patient demonstrating the non visibility of connectors between abutment teeth and pontic.

was done. The patient was satisfied with the outcome (esthetic and functional) of the FPD (**Fig 1D**).

DISCUSSION

A case of a young male patient whose esthetic rehabilitation was successfully accomplished with a fixed partial denture using a loop connector has been presented. The main feature of this dental treatment is the incorporation of uniformly distributed diastema within a fixed partial denture. Long span partial edentulous situations are generally indicated for a cast partial denture. However, in present times the patients demand for having a fixed prosthodontics that is economical has increased due to innovation in fixed prosthodontics (Mattoo, K. *et al.*, 2015). Ideally an implant supported prosthesis has more advantages than other treatment options, but most of the patients prefer a quicker and a cheaper treatment rather than an expensive one that takes long time. It has been, however, reiterated that sufficient patient education and motivation are required to place a removable rather than a fixed prosthesis (Mattoo, K. *et al.*, 2015). The common characterization in a fixed partial denture prosthesis are related to the gingival porcelain

application or application of porcelain stains (Kumar, L. *et al.*, 2010; & Kumar, S., & Mattoo, K.A. 2010). 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.

Two principle designs are present within the domain of fixed partial dentures in managing cases of midline diastema. One is the conventional use of full metal fused to ceramic retainer and the other is the incorporation of a loop connector to a resin bonded prosthesis (St George, G. *et al.*, 2002; & Mattoo, K. *et al.*, 2014). However, the use of resin bonded prosthesis has been recommended only when occlusal variations are absent and do not present any horizontal forces to be placed on the bridge. In this case since both were non favorable therefore a conventional approach of using full metal fused to ceramic retainers were used. Another conservative option when occlusion permits is the use

of partial veneer retainers instead of complete coverage. (Urrahman, S., & Mattoo, K. A. 2017). One should, however approach with caution since they are bound to fail if occlusal considerations are neglected during treatment planning (Bhandari, S., & Bakshi, S. 2013). Partial coverage is easily dislodged under horizontal occlusal forces even with the use of highly retentive resin cements.

CONCLUSION

The use of a loop connector design in the fixed partial denture overcomes the problem of incorporating diastema within a fixed prosthesis. The careful occlusal examination is mandatory to determine the possibility of using such designs.

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Conflicts of interest: None

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