

Case Report

Anterior Aesthetic Tooth Replacement Using Loop Connectors – A Case Report

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ABSTRACT

A combination of large midline diastema, generalized spacing and missing tooth often poses as a challenging and complex clinical scenario for the prosthodontists. Usually patients with this condition have limited treatment options for prosthetic rehabilitation of their edentulous spaces. Implant supported prosthesis or fixed partial dentures are the most viable treatment options in such cases. Due to the excess space available for the pontic, fixed partial denture with loop connectors may be the most workable and effective solution to restore the aesthetic and function of the patient. This case report describes a clinical case where a loop connector fixed partial denture was fabricated and delivered to a patient with missing lateral incisor and generalized spacing in the anterior region..

Introduction

Loss of an anterior tooth at an early age can negatively affect the function, esthetics and psychological well-being of the individual. This situation is amplified if the condition is associated with large diastema in the anterior region. Implant supported prosthesis and conventional fixed partial dentures are the most common treatment options to replace missing teeth in such partially edentulous spaces.^{1,2} Although, implants can be the best treatment option, but the procedure is often complex and might prove expensive for the patient.³ On the other hand, fixed partial dentures (FPD) modified with loop connectors can be preferable in such scenarios as they provide maximum esthetics, optimum function and apt emergence profile in the anterior region.⁴ This clinical case report describes a technique to fabricate 3-unit loop connector FPD in maxillary anterior region to restore the uniform esthetics with diastema in a patient with missing lateral incisors and wide edentulous spaces.

CASE REPORT

A 34-year-old male patient reported to the Department of Prosthodontics, faculty of dentistry, Najran University, Kingdom of Saudi Arabia, with the chief complaint of missing teeth in upper right region of mouth since 3 months. The past dental history of the patient revealed a traumatic accident which led to the avulsion of maxillary right lateral incisor. On clinical examination, the edentulous region was wide mesio-distally in the region of missing right lateral incisor. There was generalized spacing in the maxillary anterior region from the right canine to left canine teeth. Radiological examination revealed less bone in the right maxillary lateral incisor region. Medical history of the patient was non-contributory. The primary expectation of the patient from the treatment was to restore the tooth esthetically and maintain the diastema as well. Treatment options for the patient included implant supported prosthesis and FPD with loop connectors. On discussion with the patient, due

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to its unaffordable cost along with the poor availability of the bone in missing right maxillary lateral incisor, the option of implant was rejected and 3-unit porcelain fused to metal FPD from canine to central incisor with intermittent loop connectors between 13, 12 and 11 was considered and planned. The patient was explained about the treatment procedure and consent was taken for the same.



Fig. 1



Fig. 2

PROCEDURE

In the first appointment, photographic records were taken (Fig 1 and Fig 2), diagnostic impressions were made and the casts were articulated on a three-point articulator. Shade selection was determined at this stage. Tooth

preparation was done for porcelain fused to metal on 11 and 13 (Fig 3). Shoulder finish lines and equigingival margins were kept in the abutments to enhance the



Fig. 3



Fig.4



Fig. 5

esthetics and prevent the display of metal through the transparent enamel. Lingual clearance of 1 mm was

provided to eliminate any inter-occlusal interference. Once the final preparation was confirmed, gingival



Fig. 6



Fig. 7

retraction cord was used to retract the gingival. Final impression was made with light and putty double mix elastomeric impression material. The impressions were poured using Type IV dental die stone. Inter-occlusal bite registration was done using a rigid polyvinylsiloxane bite registration material. The master casts were retrieved and die cutting was performed subsequently on the models. After this, the casts were mounted on a semi-adjustable articulator using face-bow transfer. Wax pattern of the FPD with loop connectors were fabricated using blue inlay wax. Wax spaces were placed on the palatal region to facilitate oral hygiene maintenance in the final prosthesis. The wax pattern was evaluated for proper shape, form and contour before investing them in phosphate-bonded investment material and casting in

base metal alloy. After this, the metal try-in was confirmed and checked for any impingement of palatal tissue (Fig 4). After the trial, the ceramic was fired at the manufacturer's recommended temperature. Glazing and polishing of the prosthesis was performed to provide proper contour and shine to the FPD with loop connectors. Try-in was done, occlusal interference was evaluated and shade was confirmed with the patient (Fig 5 and Fig 6). The abutment teeth were cleaned, dried and the final FPD with loop connectors were cemented using Type I luting glass ionomer cement (GIC). The FPD was firmly seated and the excess GIC was removed (Fig 7). Since the loop connectors can restrict the hygiene maintenance, the patient was informed about the same. Post-cementation, the patient was instructed to maintain proper oral hygiene using dental floss, super floss and interdental brush. The patient was recalled after 1-week and evaluated thoroughly for occlusal interference, gingival irritation and hygiene related issues.

DISCUSSION

Restoring missing teeth with large diastema can be done with implant, removable partial denture (RPD), resin bonded FPD and Maryland bridge.⁵ Due to poor bone support, involvement of surgery and cost, the patient opted out for implant supported prosthesis. Since the mesiodistal space of the missing tooth was excessive, resin bonded FPD, Maryland bridge and RPD were not considered for this patient. A different kind of prosthesis which contributes to the rehabilitation of the missing tooth and also maintains the esthetics of the patient was indicated in this patient. Considering the dual role nature of FPD with loop connectors, this was decided as the best treatment option for this patient.

Loop connectors are usually indicated in cases where excessive pontic space is available, the patient wishes to

maintain the diastema, spacing between abutments is present and they are periodontally weak or pathologically migrated.⁶ They are advantageous as they preserve the natural esthetic appearance of the tooth and enhance the emergence profile of the dentition.⁷ The disadvantages associated with the FPD loop connector is mostly with its design. The loops are difficult to fabricate as they involve additional laboratory procedures. The loops can interfere with occlusion, alter the speech and cause discomfort to the patient.⁸ Linguo-palatal sound are the most affected phonetics but this can be resolved by keeping small and round connectors. Also, with the loop connectors it is difficult to maintain hygiene since the area under the loop is not self-cleansing. This can cause irritation to the underlying soft tissues.^{4,9} Hence the patients should be instructed to follow good standards of plaque control mechanism. Lastly, the loop curvatures are prone to stress and breakages. Hence it is recommended to keep the loop connectors small, less angulated and more rounded to reduce the stress levels.¹⁰ In this case, loop connector FPD was fabricated to restore the esthetics and maintain the diastema of the patient. The problem of excessive mesio-distal space of the pontic was countered by the connecting loops between the prosthesis. This approach was successful in esthetic replacement of single anterior teeth.

CONCLUSION

The best treatment plan is the one which suits the aspiration and requirement of the patient. This clinical case report describes the esthetic replacement of missing anterior tooth by loop connector FPD which provides prosthetic rehabilitation and maintains the diastema as well. The approach proved to be successful as the patient was very pleased with the final outcome of the treatment.

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