

## Bar Retained Dento-Alveolar Prosthesis: A Case Report

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**Abstract** A technique for restoring missing anterior teeth with associated extensive alveolar bone loss has been presented. This technique combines fixed and removable restorations where in removable prosthesis that restores the alveolar defect gets attached to the fixed prosthesis through precision attachment. The fixed prosthesis contributes to esthetics, function and also elevates patient's self image. The removable prosthesis provides the much needed soft tissue support and also facilitates oral hygiene maintenance.

**Keywords** Bar attachment · Dento-alveolar prosthesis · Fixed-removable prosthesis · Restoration of extensive edentulous ridge defect

### Introduction

Missing teeth are replaced by fixed or removable prosthesis. Fixed restorations improve patient comfort and masticatory ability, maintain health and integrity of dental arches and in many instances elevates patient's self image [1]. If there is a gross defect in the edentulous ridge, augmenting the ridges with grafts helps in construction of fixed prosthesis [2] or the defect can be restored with a removable partial denture so as to enhance function and esthetics [3]. A viable alternative in such situations would be a fixed-removable prosthesis [4, 5]. This report describes a modified approach in fabricating a dento alveolar prosthesis where the removable prosthesis that restores the alveolar defect gets attached to the fixed prosthesis through bar attachment.

### Case Report

A 23-year old male patient reported with the chief complaint of unaesthetic appearance due to missing maxillary anterior teeth. Past dental history revealed that patient had undergone radicular cyst enucleation involving maxillary left central incisor, right central and lateral incisors, right canine and premolars, along with the associated alveolar structures. On intra-oral examination, the surgical resection left a gross maxillary dento-alveolar defect without any oro-antral communication (Fig. 1). The periodontal condition of remaining teeth was evaluated. Treatment plan was designed to fabricate a fixed-removable prosthesis using precision attachment, following routine oral prophylaxis measures.

Metal-ceramic tooth preparation was done on 17, 16, 22, 23, 24 and 25. Master impression (putty-wash technique)

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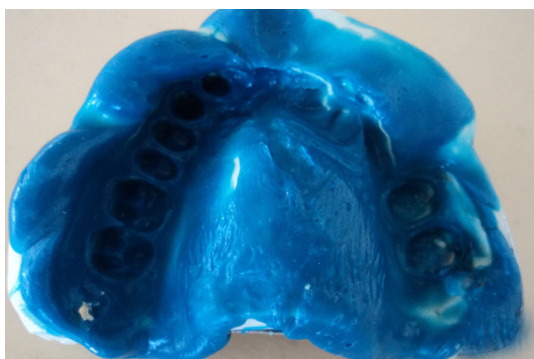
**Fig. 1** Pre operative intra oral view

was made with an addition silicone elastomeric impression material (Fig. 2) (Charmflex, DentKist Inc. Korea) and cast poured in Type IV dental stone (Ultrarock, Kalabhai, India) (Fig. 3). Temporary acrylic fixed partial denture (DPI, India) was fabricated and cemented with Zinc oxide eugenol free cement (Temp Bond-NE, Kerr, USA).

A conventional wax pattern (Yeti, Germany) was fabricated for the metal ceramic fixed partial denture framework. An innovative approach was taken by modifying this wax pattern by incorporating a prefabricated plastic bar (Rhein '83, Italy) in the cervical aspect of pontic region (14, 13, 12). This bar facilitates the attachment of removable alveolar prosthesis. The modified wax pattern complex was invested and cast with nickel–chromium alloy (Bellabond plus, Bego, Germany).

The finished metal framework was tried in the patient's mouth for marginal fit (Fig. 4). Metal framework was then veneered with ceramic (d Sign, Ivoclar) and pink porcelain added to the gingival embrasure area of the pontics to simulate interdental papilla. As the maxillary right canine was missing, canine guided occlusal scheme was not possible. Hence, unilateral balanced or group function occlusal scheme was considered for this case.

A bisque trial was done to check occlusion (group function occlusion) and esthetics (Fig. 5). The fixed prosthesis was placed on the master cast and the wax pattern for



**Fig. 2** Master impression



**Fig. 3** Master cast



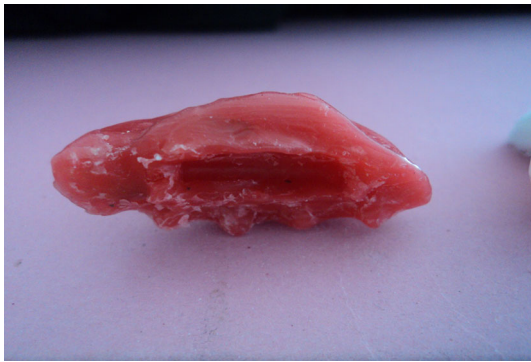
**Fig. 4** Metal try-in

removable prosthesis was fabricated. A space was provided on the inner aspect of the wax pattern corresponding to the bar of the fixed prosthesis (Fig. 6) to facilitate attachment of the elastic sleeve later. This wax pattern was then tried in patient's mouth and checked for fullness and esthetics.

Once the necessary adjustments were made, the wax pattern was processed in heat cure acrylic (Triplex, Ivoclar). The finished acrylic prosthesis was positioned over the bar portion of the fixed prosthesis to verify the fit. Undercuts around the bar was blocked with wax and the elastic sleeve (Rhein '83, Italy) positioned over the bar of



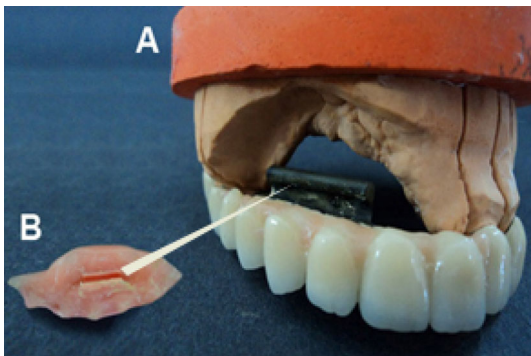
**Fig. 5** Bisque trial



**Fig. 6** Inner aspect of wax pattern (removable)



**Fig. 9** Palatal view of fixed-removable prosthesis



**Fig. 7** a Fixed prosthesis. b Removable prosthesis

fixed prosthesis placed on the master cast. The self cure acrylic resin (Triplex, Ivoclar) was mixed and added to the trough of removable prosthesis. Then the removable prosthesis was seated precisely over the bar of fixed prosthesis and held in its intended position until it cures completely. Excess resin around the sleeve was removed and polished carefully (Fig. 7). The fixed-removable prosthesis (Fig. 8) was then tried in the patient's mouth to check for fit (Fig. 9), esthetics and phonetics before luting the fixed component.

The FPD was cemented with Glass Ionomer cement (Type 1- GC, Fuji). The patient was instructed to insert the



**Fig. 8** Fixed-removable prosthesis



**Fig. 10** Post operative intra oral view



**Fig. 11** Post operative extra oral view

acrylic portion from labial aspect to seat in its position (Fig. 10) and removed for cleaning by pressing from the palatal aspect. Figure 11 shows the extraoral view of the patient with fixed-removable prosthesis. Post insertion instructions were given and patient was reviewed after 24 hours.

**Discussion**

Missing oro-facial structures can be replaced with removable or fixed prostheses. In this case, where there is a gross

soft and hard tissue defect, giving a fixed prosthesis alone would not yield satisfactory results as it would have made the prosthesis really bulky and heavy. In such instances, one will have to augment the ridge before going for a fixed prosthesis. The other option would be a removable prosthesis but this might compromise the patient's comfort level taking his age into consideration. Hence the use of precision attachment that bridges the advantage of both the fixed and removable prosthesis was considered in our case.

### Conclusion

Tooth replacement in the maxillary anterior region is difficult especially if there is significant loss of the residual ridge and the soft tissue. This article showed such a clinical case where a young patient was treated with a metal-ceramic fixed partial denture and acrylic removable gingival prosthesis to reestablish the esthetics in the maxillary anterior region.

Periodic inspection and maintenance therapy will always be required if damage to the supporting structures is to be prevented. Precision attachments will continue to provide limited but valuable assistance where conventional prostheses are unsuitable.

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