

## PROSTHETIC REHABILITATION OF DISTAL EXTENSION WITH FIXED-REMOVABLE PARTIAL DENTURE PROSTHESIS USING CUSTOM MADE SEMI-PRECISION ATTACHMENT-CASE REPORT

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### **ABSTRACT**

It is a challenge to satisfactorily restore partial edentulous patients, especially when unilateral or bilateral posterior teeth are missing. Partially one of the treatment modality to achieve full mouth rehabilitation of partial edentulousness using extended precision attachment in removal partial denture. Although RPD is well designed but not used by the patient might be due to not preferred appearance and retentive quality. This paper describes a case report of a patient with maxillary bilateral distal extension span restored with custom-made extended precision attachment. With the use of custom made extra coronal precision attachment eliminate metal display and improve retention.

**Keywords:** Fixed dental prosthesis, fixed-removable partial denture, precision attachment, removable partial denture: Custom-made attachments

### **INTRODUCTION**

Fabrication of a complete denture or partial denture has always been a challenge to the prosthodontist, which offers adequate retention, support, stability, and most importantly provides comfort and satisfaction to the patient.<sup>1</sup> The clinicians should be aware of all types of prosthodontic treatment options available for the elderly population as today's world elderly population more concerned about their oral health care and is more demanding toward their treatment from clinicians.

To rehabilitate patients with few remaining teeth as in Kennedy's class I & II cases as the distal abutment is unavailable is always challenging for a Prosthodontist.<sup>2</sup> In fixed options implant-supported prosthesis can be placed but, the lack of underlying bone and treatment cost limits the options. In this scenario treatment with a cast partial dentures or acrylic partial denture is the only resort. This provides affordable treatment options and hope for the patient.

Precision attachment dentures have long been advantageous in dentistry as it combines fixed and removable prosthodontics. Attachment-retained partial dentures facilitate both esthetic and functional replacement of missing teeth. Studies have shown a survival rate of 83.35% for 5 years, of 67.3% up to 15 years, and of 50% when extrapolated to 20 years.<sup>3,4</sup>

This paper describes one of the treatment plan of a patient with maxillary distal extension Kennedy's class I condition which is prosthetically restored by an acrylic partial denture retained using a custom-made extended precision attachment.

### CASE REPORT

A 60 year old female reported partially missing teeth in the maxilla and a completely edentulous mandible. On intraoral examination, it was noted that the patient had missing maxillary 13, 16, 17, 22, 23, 24, 25, 26, 27 (Kennedy's Class 1). After complete clinical and radiographic examination, a prosthetic treatment plan was set up. A metal ceramic fixed partial denture prosthesis with extracoronary precision attachment was planned for missing maxillary teeth and acrylic denture was planned for lower arch.

Radiographic examination (fig. 1) was done to evaluate the abutment periodontal health and crown-root ratio. Diagnostic maxillary and mandibular casts were made. Tentative jaw relation was recorded to determine the approximate vertical dimension and plane of occlusion, Interarch space was found to be adequate. Endodontic treatment was carried out for 11, 12, 14, 15 & 21, and then the coronal portion of teeth was prepared (fig.3)



**FIGURE 1. ORTHOPANTOMAGRAM OF UPPER AND LOWER JAW**



**FIGURE 2. PRE OPERATIVE**



**FIGURE 3&4. TEETH NUMBERS 11, 12, 14, 15 & 21 PREPARED TO RECEIVE**

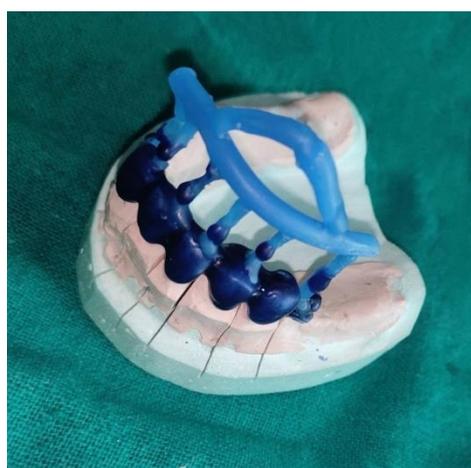
### PORCELAIN FUSED TO METAL CROWNS

Wax patterns were fabricated for all the prepared teeth and a wax custom bar running over the edentulous area was connected to the prepared wax patterns of 21 & 15. Ball attachment patterns were attached to the custom bar in the region of the central incisor & second

premolar (fig.5&6). Surveying was done over the cast to check the parallelism of the custom-made attachments. The casting was done using CoCr alloy in the laboratory using the conventional techniques with the custom ball attached distally (fig.7&8).



**FIGURE 5&6. Model and Wax patterns with attachment**



**FIGURE 7&8. THE CASTING WAS DONE USING CoCr ALLOY WITH THE CUSTOM BALL ATTACHED DISTALLY**

Metal framework try-in was performed and evaluated for esthetics and phonetics (fig.9). A metal ceramic bridge was then prepared for 11, 12, 14, 15, and 21, and luted with temporary cement. The Custom tray was fabricated and secondary impression was taken with light body material. Pick up impression was taken with irreversible impression material, cast was poured with die stone (gypsum type III).

After the Intraoral framework try-in was done to assess the fit and available interarch space. Ceramic (VITA Zahnfabrik, Germany) layering was done with respect to all the retainers and the bisque trial was done to evaluate the shade and fit of the fixed prosthesis (fig.13)



**FIGURE 9. METAL FRAMEWORK TRY-IN**



**FIGURE 10. MODEL WITH PFM CROWN JOINT WITH ATTACHMENT**



**FIGURE 11&12 ORTHODONTIC SEPARATORS ATTACHED ON CUSTOM ATTACHMENTS**



**FIGURE 13. TRY-IN OF THE JOINT PFM CROWN WITH CUSTOM MADE ATTACHMENT**

Fabricated denture base and the wax occlusal rim covering the edentulous area. With help of plane analyser occlusion plane was recorded. Jaw relation was done and articulated. Teeth arrangement was done waxed denture try-in was done (fig.12) followed by acrylization using

heat-polymerized acrylic resin (Trevalon HI, Dentsply, India). Prosthesis finishing and polishing was done.



**FIGURE 14. TEETH ARRANGEMENT WAS DONE AND TRY IN DONE**

Prosthesis framework with attachment was cemented using type 1 glass ionomer cement (GC Gold Label 1, Japan) Orthodontic separators were placed over the custom ball attachments and the intaglio surface of the denture was adjusted according to it. The separators were later picked up by adding auto-polymerizing resin in the space while maintaining the proper occlusion of mandibular denture and maxillary teeth (fig.13)

Excess of self-cure resin was trimmed off and denture was finished and polished again (fig.13). The denture insertion was done and appropriate post insertion instructions were given to the patient regarding insertion (fig.14)



**FIGURE 15. ACRYLIZED PROSTHESIS SHOWING FEMALE O-RING ATTACHMENT**



**FIGURE 16. POST INSERTION PHOTO WITH COMBINED PROSTHESIS SEATED**

## Discussion

A fixed-removable prosthesis is an efficient and cost-effective treatment option for long span partially edentulous ridge additionally provide retention and stabilizing qualities and also splint the teeth. Oral hygiene maintenance and prosthesis care is required. Success of prosthesis requires clinical skills, laboratory important, proper execution of laboratory procedure. This technique using custom-made ball attachments and orthodontic separators provides a simple and cost-effective alternative to the use of prefabricated attachment systems. Separators are relatively easy to use since the diameter of the required dimension is available. The Inner and outer diameters of the separator are 2.23 and 4.23 mm respectively.<sup>5</sup> The Study conducted by Persic et al. on various option of treatment plan considering chewing, esthetics and oral health, concluded that precision attachment retained RPD was better than clasp-retained RPD.<sup>6</sup>

As the bone length and a bone graft may require in implant placement, implant placement can be a questionable procedure. Even FPD cannot be suitable in long pontics as it compromises the biomechanics of prostheses. Hence, considering age and financial status, precision attachment-retained fixed-removable prosthesis was selected.

### Conflicts of interest

There are no conflicts of interest.

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