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CASE STUDY

REHABILITATION OF KENNEDEY'S CLASS I MAXILLIARY ARCH USING EXTRACORONAL ATTACHEMENTS

***Zarir Ruttonji, Chandan Dhongde, Manisha Herekar, Viraj N Patil and Shruti Gundewar**

Department of Prosthodontics, Maratha Mandal's NGHIDS & RC, Belgaum

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ABSTRACT

In fast paced and upwardly mobile society, patients will mainly see a dentist for two reasons; discomfort or esthetics. Attachments provide a very important psychological union in treating patient as a whole and not merely as a disease. Attachment dentistry provides superior cosmetic and functional alternatives to the standard cast partial denture with clasps. They can offer advantages in advanced restorative procedures because of their adaptability. Attachments are stress redirectors and absorbers. Their function is to preserve soft tissue and bone as well as provide retention. The correct use of attachments may overcome both physical and psychological problems associated with conventional RPD designs. It is important to realize no attachment is perfect for every application. So the main purpose of this article is to provide an overview and a simplified approach to this treatment modality by way of a case report.

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INTRODUCTION

A partial or complete edentulous condition not only affects the functional and esthetic efficacy of the patients, but also has a big impact on their psychological well-being. Dental profession must be able to relate the patient's concern both physically and psychologically. A regular problem faced by the partially edentulous patient is the refinement of adapting to the removable prosthesis. Rehabilitation of Kennedy's class-I & II partially edentulous patients can be challenging because a natural tooth retained fixed prosthesis cannot be fabricated. Implant retained restoration is an option but this is sometimes not possible due to inadequate bone and economic reasons. In these cases acrylic or cast partial dentures have been largely used. But, the successful restoration of dentition requires plenty of contemporary and conventional treatment techniques, and planning an attachment retained partial denture is one of such treatment modality in prosthodontics. Apart from the aesthetic and functional advantage of a fixed denture, this prosthetic option also provides enhanced mastication and phonetics together with decreased resorption of the edentulous ridge. A few retrospective studies have shown a survival rate of 83.3% for 5 years, of 67.3% for upto 15 years and 50% when extrapolated for 20 years (Burns and Ward, 1990). Here, in this case an attachment retained cast partial denture was chosen as a treatment modality. This article provides an overview and simplified approach to this treatment plan.

Corresponding author:* **Zarir Ruttonji,
Department of Prosthodontics, Maratha Mandal's NGHIDS & RC, Belgaum

Case Report

A 46 years old male patient reported to the Department of Prosthodontics Crown and Bridge & Implantology, Maratha Mandal's. N .G. Halgekar Institute of Dental Sciences and Research Centre, Belgaum with the chief complaint of missing teeth in upper right and left posterior regions of jaw, and in ability to chew food. He had a history of extraction 1 year back in upper posterior regions due to dental caries. Intra-oral examination revealed missing 15, 16, 17, 18, 25, 27, 28 and 36. (Fig.1) Patient's medical history was evaluated and was found to be non-significant. Due to the long span of the edentulous ridge on right side in maxillary arch and supra-erupted 26, conventional fixed partial denture prosthesis was not possible, so several other treatment options were offered to patient like: An implant supported prosthesis, precision attachment with removable prosthesis, and a conventional RPD. Patient was not willing for treatment with implant supported fixed prosthesis due to the additional surgery and duration of treatment phase. After reviewing these options, patient accepted the precision attachment with removable prosthesis.

METHODOLOGY

Diagnostic impressions and Facebow transfer were made. Tentative jaw relation was recorded to access vertical

dimension and mounted on Hanau Wide-Vue articulator. The supra-erupted tooth 26 was extracted due to poor prognosis (Fig.2). Intentional root canal treatment with 14 and 24 were performed due to severe attrition of teeth (Fig.3). The attachment system was selected on the basis of available interarch space. Tooth preparation was done on 13, 14 and 23, 24 to receive PFM crowns which were further used as abutments. Putty wash impression was made (Fig.4) and poured in die stone.

Fig.1. Pre-operative photographs

Fig.2 extraction of 26.fig.3 root canal treatment with 14, 24

Fig.4. Putty wash impression

Wax patterns of copings were made on the stone model and the plastic form of the Ceka attachments were attached to the copings using a dental surveyor. Custom tray was fabricated on diagnostic cast to make the pickup impression. Metal try-in of coping with Ceka attachments were done in patient's mouth to evaluate fit of casting (Fig.5). Ceramic layering was done and tried in patient's mouth (Fig.6). Fabricated metal ceramic crowns were provisionally cemented and pick up impression was made using medium body impression material in custom tray (Fig.7). Master cast was obtained from this impression which was followed by the fabrication of cast partial denture frame work.

Fig.5. Metal coping try-in

Fig.6 ceramic build-up try in

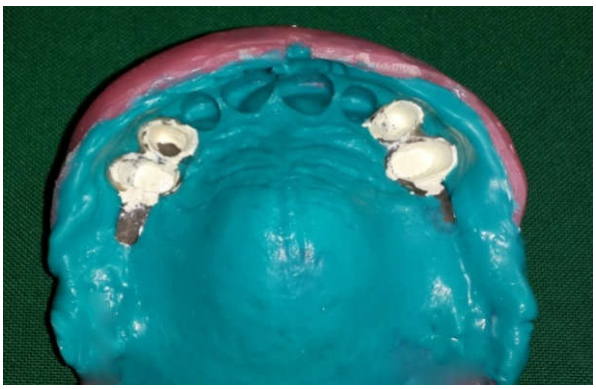

Fig.7 pick-up impression

Once the frame work of cast partial denture was fabricated, it was tried in patient's mouth to verify the fit (Fig.8). After that occlusal rim was adapted on framework and Maxillo-mandibular relations were recorded (fig.9). Teeth arrangement and try-in was done (Fig.10), followed by the acrylization of cast partial denture using high strength heat cure acrylic resin.

The PFM crowns were cemented with glass ionomer cement on 13, 14 and 23, 24. Cast partial denture was attached with FPD and occlusion was verified (Fig.11). Patient was explained about the post-operative care and oral hygiene instructions were reinforced. Patient was recalled after 48 hours for follow up.

Fig.8. Frame work of cast partial denture

Fig.9. Maxillo-mandibular relation

Fig.10. Teeth arrangement and try-in

Fig.11. Final prosthesis

DISCUSSION

Stress control on abutment teeth is an essential factor for the success of distal extension cast partial denture which is achieved through dual impression technique, broad coverage, stable denture base, rigid design, physiologic shimming, splinting of abutments, proper selection of attachments (Preiskel, 1969; Picton and Willis, 1978). Despite, a growing trend to use fixed dental prosthesis to maintain more teeth in older age-groups and an increasing use of dental implants, removable dental prosthesis are still prevalent (Zitmann *et al*., 2007). Dr. Herman Chayes first reported the invention of attachment in the early 20th century (Preiskel, 1985). Precision attachment has an exceptional feature of being a removable prosthesis with improved aesthetics, less post-operative adjustments, and better patient comfort (Feinberg, 1982). They are mostly indicated in long edentulous spans, distal extension bases, and non-parallel abutments. The proposed procedure has several advantages over conventional prosthesis. In this case report, the teeth used as abutment had adequate clinical height to receive attachments, multiple abutments were splinted anterior to edentulous span to aid in better stress distribution. Kapur *et al* has suggested that splinted 1st and 2nd premolar by full coverage crown, has provided good support and improved the prognosis of cast partial denture. As the cast partial denture is fixed removable type, maintenance of oral hygiene is relatively easy. Added to this, the final adjustments are minimum and the patient handling of the prosthesis is easy.

Conclusion

Dental surgeons will require a broad based education together with technical knowledge and ability to enable them both to understand and to treat the problems that confront them. Complete evaluation with oral roentgenograms and diagnostic casts mounted on adaptable articulator, should be minimum requirement in planning of oral restoration. Sometimes this should be provided with careful discussion of general health, mental reactions, and oral prophylactic treatment options. The restoration of partially edentulous mouth will continue to tax the ingenuity of the dental practioners, while precision attachments will continue to provide limited but valuable assistance where conventional prosthesis are not suitable.

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