

Unilateral Precision Attachments: A New Dimension

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ABSTRACT

Background: Rehabilitation of partially edentulous patients with the absence of unilateral or bilateral posterior segment of teeth is challenging. Optimal restoration is possible with many treatment options out of which attachment-retained cast partial dentures is one. Precision attachments are small interlocking devices to attach prosthesis to abutments offering a variety of solutions to face the challenge of attaining balance between functional stability and cosmetic appeal. It is imperative that dentists must have thorough knowledge about the use and success of attachment retained removable prosthesis which is necessary to benefit the patients. Selection of appropriate attachment type will be decided only after the proper diagnosis and treatment planning. Enhancing retention of removable partial prosthesis with the help of extra coronal attachment will be discussed in this case report.

Keywords: Precision/semi-precision attachments, Preci-Vertex attachments (Ceka), Removable partial denture.

INTRODUCTION

Prosthodontic rehabilitation of patients with multiple missing teeth poses great challenge for the clinician. Conservative treatment approach eliminating or delaying prosthodontic problems in future should be considered¹. Though recent advancements in the field of dental implantology have made the treatment outcome more predictable and successful, preservation of natural teeth or roots is more desirable to the patients and also in accordance with the De van's dictum. It can be achieved by the use of precision/semi precision attachment which improves retention, stability, esthetic and psychological comfort of the patient. Classic indication of precision attachment is unilateral or bilateral distal extensions. It is important to achieve both esthetic and functional success in such cases². Semi precision attachments consist of custom-made rigid metal extension - matrix extending from prosthesis that fits into slot or

keyway - matrix in a cast restoration, which allows some movement between components. Present case report describes use of preci-vertex attachment in maxillary and mandibular arches to rehabilitate a partially edentulous patient.

CASE REPORT

A 53 year old female patient reported to the Department of Prosthodontics with the chief complaint of compromised esthetics and masticatory function. Clinical examination revealed multiple missing teeth in maxillary and mandibular arches with no loss of vertical dimension and adequate interocclusal space. Teeth present were 23, 24, 25, 31, 32, 33, 41, 42, 43,44 (Fig. 1). Diagnostic impressions were made using irreversible hydrocolloid impression material (Tropicalgin, Zhermack). Diagnostic mounting revealed sufficient interocclusal space for

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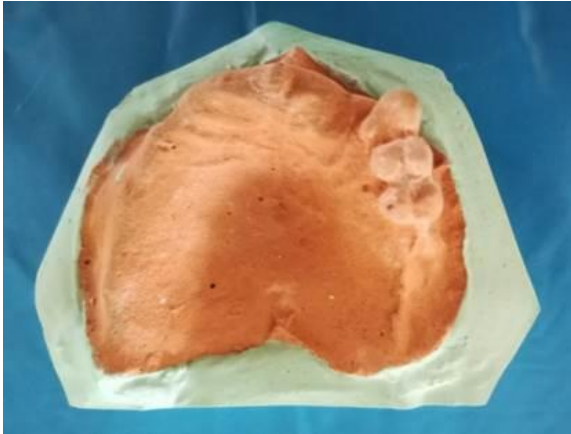


Fig 1: Pre – operative cast



Fig 5: Maxillary FPD with preci-vertex attachments



Fig 2: Metal try-in for maxillary FPD



Fig 6: Post – cementation OPG



Fig 3: Maxillary FPD bisque try-in



Fig 4: Mandibular FPD bisque try-in



Fig 7: Maxillary and mandibular final dentures



Fig 8: Maxillary final denture insertion



Fig 9: Mandibular final denture insertion

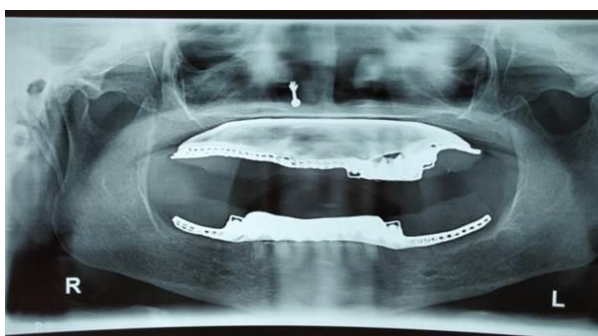


Fig 10: Post insertion OPG

placement of semi-precision attachments. Following teeth were prepared to receive the attachment - 23, 24, 25, 32, 33, 43, 44. 31, 41, 42 were planned to receive metal-ceramic crown. Final impressions for crowns were made with polyvinyl siloxane impression material (Aquasil Putty and Light body, Dentsply) and casts were poured with die stone. Wax-up with surveying was done to receive preci-vertex attachments (Fig. 2). Fixed partial dentures were fabricated in Ni-Ti alloy with rest seats in both

maxillary and mandibular arches. Metal try-in was done. Pick-up impressions were made at the time of bisque try-in (Fig. 3,4) and casts were poured in die stone. Duplication was followed by refractory casts fabrication. Wax pattern was fabricated for maxillary and mandibular cast partial dentures on the refractory cast. The major connectors of choice were maxillary complete palate major connector and mandibular lingual plate. Casting was done in Cobalt-Chromium alloy. This framework was tried on the original cast poured from the pick-up impression. It is checked in relation to fixed partial denture for the fit with respect to the attachment. Cast partial denture framework was then tried in the patient's mouth. Occlusal rims were fabricated over it and jaw relation was recorded. Teeth arrangement was done followed by try-in. Final prosthesis was fabricated in heat cure acrylic resin (Fig 5-10).

DISCUSSION

Depending on the method of fabrication, attachments can be classified as precision and semi-precision attachments³. Precision attachments are prefabricated attachments with precisely fitting machine-made metal components. Though semi-precision attachments are less precise, for past 50 years or more these attachments have been preferred in cases of reduced tooth support^{2,4}.

According to Feinberg classification of precision attachments, preci-vertex attachments are categorized as passive type of attachments. These are free moving attachments dissipating lateral forces protecting the abutment teeth⁵. One of the prime indications of use of an attachment in place of conventional clasp assembly is esthetics. Preci-vertex attachments get enclosed within contours of the prosthesis, thus eliminating its display which is not the case with conventional clasp assembly and rests. These attachments exert force on tooth more apically than exerted by occlusal or incisal rests. As the length of the lever arm is shortened the torquing force is reduced⁶. Attachments may provide better cross-arch force transmission and stabilization than conventional clasp assembly. This will be determined by the type of attachment, adaptation of the framework with the attachment, design of the framework, number of guiding surfaces⁷. Since highly resilient extra-coronal attachments allow omniplanar motion, attachment alignment is not a

very critical factor. Therefore, multiple paths of placement are possible for the prosthesis⁹.

When very few natural teeth are present and abutment location is not ideal, removable partial denture with attachment is a favorable treatment option. Canine teeth due to their root length, root shape, larger periodontal ligament area providing better proprioception and strategic location in the arch, are considered as ideal abutments⁸.

In this case Preci-Vertex (Ceka) attachments were used that provided frictional retention to the maxillary and mandibular cast partial denture. Preci-Vertex (Ceka) attachments are extra-coronal attachments in which the female component has exchangeable plastic layers of various sizes to vary the retention force. Better stress distribution was achieved by cross arch splinting of the mandibular canine and premolar. Hence, rate of alveolar bone resorption was decreased. Preci-vertex resilient attachments are based on broken stress philosophy. They serve the role of stress breaker as well as stress redirector. During mastication vertical movement is allowed in these attachments, thereby the stress transferred to the abutments is reduced. It also directs the forces to the residual ridge, thus distribute forces equally between soft and hard tissues. Therefore, it can be successfully used in Kennedy class I, II situations. As it dissipates the lateral forces, protects the abutment teeth and generates a healthy favorable response from the soft tissue.

The success of these attachments depends on patient's maintenance. Poor maintenance or dexterity can result in early failure than conventional clasp assembly. Repair or alterations are difficult or almost impossible for these attachments. Short clinical crown height poses a contra-indication. A minimum of 4mm of vertical space is necessary for most of the attachments⁹.

CONCLUSION

Removable partial prosthesis with attachments is a viable and versatile treatment option in patients with multiple missing teeth especially distal extension cases with high esthetic demands. It gives scope for future dental implant supported treatment modalities when patient is ready for it

psychologically and financially. Multi-disciplinary treatment plan in accordance with patient's esthetic requirements along with patient's maintenance are important for a long-term successful outcome of the attachment retained prosthesis.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Brewer AA, Morrow RM (1980) Overdentures, 2nd edn. C.V. Mosby, St. Louis
2. Burns DR, Ward JE. A review of attachments for removable partial denture design: Part 2. Treatment planning and attachment selection. *Int J Prosthodont* 1990;3:169-74.
3. Burns DR, Ward JE. Review of attachments for removable partial denture design: Part 1. Classification and selection. *Int J Prosthodont* 1990;3:98-102.
4. Wichmann MG, Kuntze W. Wear behavior of precision attachments. *Int J Prosthodont* 1999;12:409-14.
5. Feinberg E. Precision attachment case restoration with implant abutments: A review with case reports. *J Oral Implantol* 2011;37:489-98.
6. Schuch C, de Moraes AP, Sarkis-Onofre R, Pereira-Cenci T, Boscatto N. A clinical report. *J Prosthet Dent* 2013;109:1-4.
7. Staubli PE. Attachments and Implants: Reference Manual. 6th ed. San Mateo, CA: Attachments International; 1996.
8. K Jayasree, M Bharathi, V Dileep Nag, B Vinod. Precision Attachment: Retained Overdenture. *J Indian Prosthodont Soc* 2012, 12(1): 59-62.
9. Vaidya S, Kapoor C, Bakshi Y, Bhalla S. Achieving an esthetic smile with fixed and removal prosthesis using extracoronally castable precision attachments. *J Indian Prosthodont Soc* 2015, 15:284-88.

