Over denture with ceka attachment: An alternative treatment modality to rehabilitate partially edentulous condition - A case report

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Abstract
Attachment retained removable partial denture facilitates to replace the cosmetic and functional requirement to rehabilitate long edentulous span, distal extension situation and abutments with different path of insertion. Selection of attachment system is based on the distribution of forces to improve function and maintain health of remaining alveolar ridge and teeth. This clinical report describes a multidisciplinary approach to treat a long span distal extension condition using over denture with ceka attachment.

Keywords: Proprioception, Bone preservation, Retention, Masticatory efficiency, Preventive prosthodontics.

Introduction
Partial or completely edentulous patient's have to deal with the functional and psychological impact. The goal of modern dentistry is to return patient's oral health in a predictable fashion and preserve of the remaining existing structure.

Preventive prosthodontics accentuates any procedure which can delay or eliminate future prosthodontic problems.[1] Over denture is one of the most commonly practiced measures in preventive prosthodontics. Over denture is any removable dental prosthesis that covers rests on one more remaining natural teeth, the root of natural teeth, and or dental implant.[2]

The goals of overdenture are preservation of bone, improve the proprioception and give a psychological benefit to the patient of having his or her own teeth.[3] Attachments add a new dimension to improve the retention and stability of overdenture during prosthodontic rehabilitation. An attachment is a connector consisting of two or more parts. One part is connected to a root, tooth or implant and another part to the prosthesis.[4] Precision attachment for removal partial denture is divided into intracoronal and extracoronal. Ceka attachment is a prefabricated, resilient, non rigid attachment which can be used intracoronally or extracoronally.[5] This article describes about the attachment retained removal denture in treating partially edentulous condition.

Case Report
A 48 year old healthy male patient reported to the Department of Prosthodontics and Crown and bridge to replace his missing natural teeth. Patient had a history of loss of his teeth over a period of 3 years due to multiple caries and periodontal problems. On intraoral examination, revealed a completely edentulous maxillary and partially edentulous mandibular arch with Kennedy's class II modification I (Fig. 1).

Fig. 1: Pre- operative view

The remaining teeth 33 and 44 were periodontally sound with no signs of pain and inflammation of gingiva. The radiographical assessment showed a good alveolar bone support with no periapical pathology in relation to 33 and 44. Considering the patient's demand on better retention, esthetics and functional stability than his previous denture, a conventional maxillary complete denture and tooth supported mandibular overdenture was planned. Diagnostic casts were mounted to assess the amount of inter arch space available for attachment.

Treatment phase was divided into oral prophylaxis, endodontic phase followed by prosthetic phase. All the procedures had been explained to the patient and consent was taken. Endodontic phase included intentional root canal therapy for 33 and 44. These teeth were reduced at the level of gingiva and sharp edges of the teeth were rounded up.

Post space was prepared with the pre drilling burs and the base of the Pre clix post was prepared with the diamond burs. Reamer was used to prepare the diameter of the post. The post was cemented with Glass ionomer luting cement (Gold label 1 luting, GC, America) (Fig.2).

Fig. 2: Cementation of ceka attachements in 33,44

Primary impression of the mandibular arch was made with irreversible hydrocolloid material (Vignette, Dentsply DeTrey). Impression compound (Rolex Impression Compound, India) was used to make the primary impression of the maxillary arch. Custom made trays were fabricated with cold cure acrylic resin (Rapid repair, Pyrax, India) and two layer thick spacer was given around the post in the mandibular tray. Border moulding was performed for both the arches. Maxillary final impression was made with zinc oxide eugenol impression paste (Impression Paste, DPI, India). An elastomeric impression (Kerr Australia Pvt Ltd.) was made for the mandibular arch and poured with dental stone (Neelkanth Healthcare Pvt. Ltd, India) after placing the laboratory analogues (Fig. 3).

Fig. 3: Final impression with laboratory analogues

A temporary record base was fabricated with relief block out around the post and occlusal rims were prepared. With facebow (HANAU Spring Bow, Whip Mix Corporation, USA) transfer, (Fig. 4) the jaw relation was articulated in a semi adjustable articulator (HANAU Wide-Vue
Articulator, Whip Mix Corporation, USA).

Fig. 4: Facebow transfer

Teeth arrangement was done (Fig. 5). After verification of jaw relation and esthetics during try in procedure, the trial dentures were invested and dewaxed in a conventional manner.

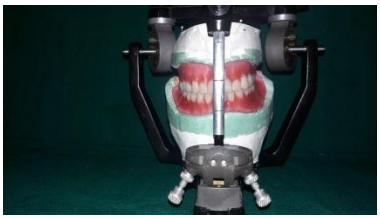

Fig. 5: Teeth arrangement on semi adjustable articulator

In the mandibular trial denture, the denture housing were secured over the laboratory analogue with rubber base impression material followed by denture acrylization. Maxillary and mandibular denture was then retreived followed by finishing and polishing of the denture. The denture was adjusted and rechecked for border extensions, vertical, horizontal dimension and aesthetics. Female retentive rings of yellow colour was then inserted into the mandibular denture using Ceka insertion tool (Fig.6).

Fig. 6: Mandibular complete denture with retentive rings

Post insertion instructions were given to the patient. He was recalled after 24 hours for checkup (Fig.7). Patient was instructed to insert and remove the denture carefully. He was motivated to maintain adequate oral hygiene for favourable prognosis of the abutments.

Fig. 7a: Pre operative view

Fig. 7b: Post operative view

Discussion

As stated by Sir MM Devan "*Perpetual preservation of what remains* is more important than the meticulous replacement of what is missing" that is Preventive Prosthodontics should be the rationale of any treatment. Several authors concluded that tooth supported overdenture helps for better neuromuscular control thus regulating the biting force over the denture.[6-8] The stress concentration can be shared between the denture bearing areas and the abutments. It also reduces the impact of loss of occlusal stability, loss of aesthetics and compromised mastication. The retained tooth roots used for overdenture transfers occlusion forces to the alveolar bone through periodontal ligament and maintains the crown morphology.

Abutment selection is a critical criteria for the success of overdenture treatment. The anterior mandibular ridge with cuspids and bicuspids are regarded as the best overdenture abutments because they evenly distribute the stresses in both the quadrants and also permits increase retention and stability of the prosthesis.[9] Canines are the most important proprioceptive organ because of its shape, strategic position and larger periodontal area.[10] The first premolar are alternative abutment to overdenture for canine because they are single rooted and their positions is next to canine.[11]

Also, lack of retention is a common complaint among the mandibular complete denture patients. Inception of overdenture attachments helps to obtain superior retention of the denture by redirecting occulsal forces from weeks supporting abutments to strong abutments.[12] There are various factors for selection of attachment which includes the buccuolingual width, inter arch space, amount of bone support, cost, careful selection of the strategic abutment is important.[13] Singh K stated insufficient inter arch space results in exposure of metal housing to the oral tissues and will continuously come in contact with the opposing teeth, resulting in trauma, pain of the abutments, which might later require removal of the post and even extraction of the tooth.[14]

Ceka attachment is a stud type of attachment, provides good aesthetics, ease of utilization, ease of assembly in removable partial denture prosthesis and needs high technical skill. It requires minimum occluso gingival abutment height compared to other attachments and provides better retention.[15] In this case report, Ceka attachment was opted for the patient due to limited interocclusal space.[16] It has a disadvantage that its plastic resilient cap undergoes wear from usage and has to be replaced when its retentive capacity is lost after usage. Patient was informed prior that replacement of female housing assembly might be required in future.

In the past, Precision attachments have been largely ignored by the dentists due to insufficient knowledge, cost but presently, an increase in the popularity of the preservation of the natural tooth structure; have brought a concomitant increase in the popularity of precision attachments. These attachments can be used for both implant and tooth supported prosthesis. The dental professionals must familiarize themselves with precision attachments to add a new dimension to the treatment options which can be rendered to the patients.[17]

Conclusion

Attachment retained over denture is an alternative treatment modality for extraction of teeth and dental implant to improve the retention of the prosthesis. Retention obtained from the natural tooth allows the patient to have more a neuro-muscular and psychological benefit. The dentist knowledge and experience about the prosthodontic principles and attachment is important for the prognosis of the attachment retained over denture.

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