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Case Report

Preventive Prosthodontics: Mandibular Tooth-Supported Overdenture Using Ceka Attachment: A Case Report

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ABSTRACT:
Overdenture is a pristine treatment modality for elderly patients with few remaining teeth. The preservation of teeth to support an attachment-retained overdenture is an appropriate and preferable alternative to complete dentures. It is much simpler, cost effective and more biologic than implant overdenture. When few firm teeth still remain in a compromised dentition, preservation of these teeth for overdentures can improve retention and stability. The concept of overdentures may not be the elixir in itself, but suitable case selection, attachment selection and adherence to basic principles of complete denture design are necessary for prevention of geriatric/denture induced sequelae. This article presents rehabilitation of a case with tooth supported mandibular overdenture using precision attachment (Ceka Preci-Clix Radicular RC).
Keywords: Overdenture, Ceka attachment, Preci-clix, Retention.

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INTRODUCTION

Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontics problems[1]. On extraction of natural teeth, the inevitable residual ridge resorption may progress to flat or atrophic ridge. So, every effort should be made to preserve root and alveolar bone[2]. Retention of teeth or tooth roots in the alveolar bone can improve bone maintenance around and between these structures. Bone maintenance is the most significant advantage of a tooth-borne complete overdenture treatment because the maintenance of bone volume and vertical height can produce improved prosthesis retention and stability[3]. Tooth-retained overdentures transfer occlusal forces to the alveolar bone through the periodontal ligament of the retained tooth roots and thereby prevent bone resorption[4].

Traditionally the majority of problems arise with a mandibular prosthesis, as due to the increased rate of bone loss and less surface area than maxillary arch. Hence, they fail to provide adequate support, retention and stability[5]. By use of attachments on the remaining teeth, enhances the retention of the denture and satisfy both the patient and dentist. Attachments may not be used by many dental professionals for reasons such as cost and reluctance to grasp the intricacies of their indications and applications[6]. Use of attachments and adherence to basic principles of complete denture design can improve both retention and stability of overdentures.

INDICATIONS

- For patients who face the loss of remaining natural adult dentition. Therefore, younger the patient greater the indication.
- Patents with badly worn-out dentition.
- Cleft palate cases.
- For congenital anomalies like microdontia, in selected partial anodontia cases, Amelogenesis imperfecta and dentinogenesis imperfecta.
- Denture for patients with maxillofacial trauma.

CONTRAINDICATIONS

- Uncooperative and under motivated patients
- Mentally and physically handicapped patients for whom good oral hygiene is difficult to maintain.
- When a patient cannot afford.

CASE REPORT

A 70 year old male patient referred to the Department of Prosthodontics and Crown & Bridge, Pacific Dental College and Hospital, for rehabilitation of his both arch. There was no relevant medical history affecting prosthodontic treatment. Intraoral examination revealed well-formed edentulous maxillary arch and in mandibular arch only 33, 43, 44 teeth are present with badly resorbed posterior region (Figure: 1).

Radiographic examination revealed sound bone support and long roots.

The treatment options available for this patient's mandibular arch were- (1) extraction of the remaining teeth followed by conventional complete denture, (2) implant supported overdenture or (3) tooth supported overdenture.

Due to a surgical procedure and cost, patient did not agree for implant supported overdenture. But for better retention than conventional denture tooth supported overdenture was planned for mandibular arch and conventional complete denture for maxillary arch.

Treatment plan included intentional root canal treatment for the selected abutments teeth 33, 43, 44. Then, tentative vertical dimension recordings were determined with the occlusal rims fabricated on diagnostic cast. The available inter-arch space was assessed and found to be adequate for overdenture stud type of attachment.

PROCEDURE

1. Preparation of the premolar teeth for cementation of Ceka attachment & posts (33, 43). (Figure: 2,3,4,5)

a) Teeth were reduced to the level of the gingiva and rounded to form a dome shape.

b) Prepared post space in 33,44.

c) Cemented Ceka post with resin cement.

2. Primary impression of Maxillary arch was made with impression compound.
3. Primary impression of Mandibular arch was made with irreversible hydrocolloid.
4. Primary cast was poured with dental plaster and special try were fabricate with spacer.
5. Border moulding and Secondary impression of maxillary and mandibular arch were made with green stick compound and medium body elastomeric impression material. (Figure: 6)
6. Master cast was poured with dental stone and fabricate denture base.
7. Occlusion rim were made.
8. Jaw relations recorded and mounted on mean value articulator. (Figure: 7)
9. Following teeth arrangement try-in was done, vertical dimension verified and centric and eccentric contacts were evaluated. Facial and functional harmony was studied and patient's approval was obtained. (Figure: 8)
10. Denture was then waxed and flasked for processing. Dentures were finished and polished.
11. The female cap (O-ring) was then attached chair-side to the denture using auto polymerizing acrylic resin. (Figure: 9,10)
12. Rubber band (provided in the kit) was used beneath the height of contour of the head (to avoid locking) and the nylon cap was placed on the ball of the post. Once the nylon cap was picked up, rubber bands were removed and flash trimmed. (Figure: 11)
13. Denture finished and inserted. (Figure:12)
14. Post insertion instructions were given along with a recall appointment.
15. After 7 days patient was recalled and final corrections were done.

Figure: 1 Pre-Operative Intraoral Frontal View

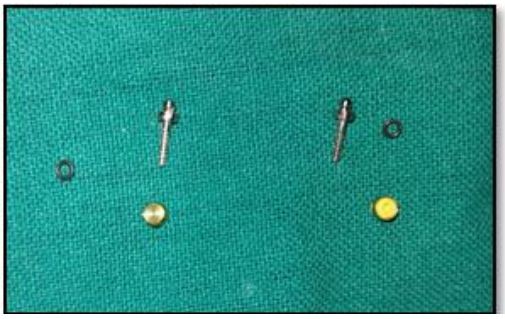

Figure: 2 Ceka Attachment (Drill, Ceka post, o-ring)

Figure: 3 Ceka Attachment kit

Figure: 4 Post space preparation

Figure: 5 Cementation of Ceka Attachment

Figure: 6 Secondary Impression

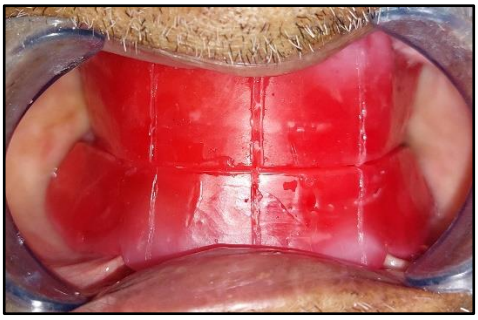

Figure: 7 Jaw relations

Figure: 8 Try-In

Figure: 9, 10 O-Ring Attached to the head of the ceka attachment

Figure: 11 Nylon cap was picked up in final denture

Figure: 12 Final denture insertion attachment

Figure: 13 Pre-Operative and Post-Operative

DISCUSSION

DeVan golden statement: "Perpetual preservation of what remains is more important than the meticulous replacement of what is missing"[7]. Overdenture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages. Crum and Rooney[8] graphically demonstrated in 5 years study an average loss of 0.6 mm of vertical bone in the anterior part of the mandible of overdenture patients through cephalometric radiographs as opposed to 5.2 mm loss in complete denture patients.

Pacer and Bowman[9], in their study found that the overdenture patient possessed more typical sensory function, i.e., closer to natural teeth than a complete denture patient in discriminating between occlusal forces. These factors greatly enhance the patient's denture coordination and ability to control the denture in his or her physiologic environment. Rissin et al.[10] in 1978 showed that the over-denture patients had a chewing efficiency one-third higher than the complete denture patient.

Overdenture attachments are classified either as studs, which connect the prosthesis to the individual tooth or as bars which connect the prosthesis to the splinted abutment teeth. Attachments redirect occlusal forces away from weak supporting abutments and onto a soft tissue or redirect occlusal forces toward stronger abutments and increases retention of the denture[4].

The keystone of success for an overdenture treatment is the selection of strategic abutments with endodontic and periodontal therapy to receive the attachment, appropriate attachment for each individual situation and establishing a careful mode of treatment[11].

This case selected for the Preci-Clix type of attachments, which belongs to the category of Stud Attachments. Preci-Clix attachments consist of male stud part that usually is a post extending into the endodontically treated tooth. The female component in the form of ring placed on the tissue side of the denture. The prefabricated metal posts exhibit more advantages over the customized cast posts. The exact fit made by special drills and minimal enlargement of the canal space, strengthen the tooth rather than weaken it[11]. The chief reasons for selection of this type of attachment are its simplicity, ability to rotate in all directions and single visit application of the attachment[12].

CONCLUSION

Though implants are getting popular now a days but tooth supported overdenture remains efficient treatment modality for its own advantages. According to Mensor, failure of overdentures with attachment fixation does not result from use of attachments. The true causes are improper selection of attachments, failure to develop proper denture base extension and border seal, and for mandibular bases, failure to cover the retromolar pad. The success of the tooth-supported overdenture treatment depends upon the proper attachment selection for the particular case which include available buccolingual and inter arch space, the amount of bone support, opposing dentition, clinical skill personal preferences, maintenance problems, cost and most important being patient's motivation.

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