Case Report

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Precision Ball Attachment Retained Overdenture- A Unique Treatment Option for Edentulous: A Case Report.

Abstract:
The overdenture treatment provides a conservative option for rehabilitation of patients with a few key teeth remaining. Retained abutments dramatically increase the overall retention and stability of the denture. Along with these benefits, the retained teeth also provide the advantages provided by the intact periodontium which provides a positive reinforcement to the underlying bone. The overdenture treatment can be provided with or without attachments. The attachments have an added advantage of being precision made to provide improved resiliency thus preserving the abutments in the process. These attachments have the added benefit of reducing the bulk of the prosthesis. Thus the precision ball attachment supported overdenture is a boon for patients who are not willing to go for surgical options or patients in whom systemic conditions contradict a surgical procedure. This article, presents a case report aimed at highlighting the usage of precision ball attachments as an adjunct to overdenture treatment.

Key Words : Access post overdenture, tooth supported overdenture, overdenture attachments, precision ball attachment.

Introduction:

A wide range of sequelae follow in a completely edentulous patient ranging from loss of proprioception,[1] shift in the forces transmitted from teeth to mucosa, progressive and chronic boneloss[2] to aneffect on the patients' morale.[3]Overdenture treatment has a host of benefits in the form of better psychological acceptance,[4] preservation of edentulous ridge,[5]vertical dimension maintenance[6,7]and improved retention and stability.[8]

Overdenture has been defined as GPT-9 "Any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants."It has also been found that, 50% of roots utilized as overdenture have been rendered immobile as reported by Renner et.al in a 4 year-long study.[3]The preserved periodontium provides shock absorbing properties, allowing tooth mobility within the physiological limit, thus having a positive effect in preserving bone.[7]

Tooth support for overdenture can be either with or without the use of attachments.Attachment provide additional advantage of improving the overall retention, stability and function of the prosthesis.[8]The overdenture treatment has been indicated in patients who have extensive loss of natural adult dentition, patients with badly worn out teeth, high palatal vault, [8] in cases of palatal anomalies, congenital microdontia, anodontia and maxillofacial trauma.[9]

The contraindications include mentally or physically handicapped patients, patients not able to maintain periodontal and overall oral hygiene. Disadvantages include increased bulk and increased load being applied to the prosthesis.[10] However advantages are greater in number.

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[1]ANURAJ VIJAYAN, [2]VISHWAS BHATIA, [3]ADITYA CHAUDHARY, [4]SYEDA TAHSEEN KULSUM
[1]I.T.S. Dental College, Hospital and Research Center, Greater Noida
[2]Director, Signature Dental 32 Clinics, Delhi
[3]I.T.S. Dental College, Hospital and Research Center, Greater Noida
[4]Private Practice

Address for Correspondence : Dr. Anuraj Vijayan
B-14/G-1, Ramprastha Colony, Ghaziabad
I.T.S. Dental College, Hospital and Research Center, Greater Noida
E mail: anurajvjn9@gmail.com

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This article presents a case report in which tooth supported overdenture was fabricated utilizing precision overdenture posts (EDS' Access post overdenture system) to improve the retention, stability and the overall function of the prosthesis.

Case Report:

Examiantion, Diagnosis And Treatment Planning

A 60 year old male patient, with chief complaint of difficulty inchewing,reported to the Department of Prosthodontics, ITS Dental College, Hospital and Research Centre, Greater Noida. The patient presented with a history of loss of all maxillary teeth due to mobility and caries over a period of 10 years. The patient presented with a non-contributory medical history. (Fig 1 and 2)

Fig 1- Pre- Op Frontal Profile Fig 2 - Pre-Op Lateral Profile

On intraoral and radiographic examination patient presented with a completely edentulous maxillary arch and partially edentulous mandibular arch with periodontally compromised tooth number 35,36,37,38,42,43,46,47 and 48. (Kennedy Class III mod 1). (Fig 3 and 4)

Fig 3 - Pre-op Mandibular occlusal view

Fig 4 - Pre-Op mandibular frontal view

Tooth number 33,44 and 45 had slight mobility within physiologic limit.The maxillary residual ridge presented with adequate bone morphology capable of supporting the maxillary complete denture. (Fig. 5)

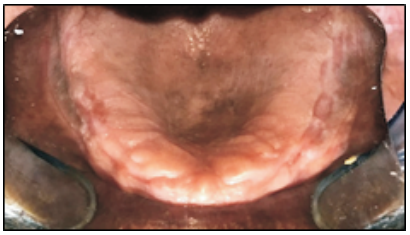

Fig 5 - Pre-op maxillary residual ridge

Fig 6 - Mandibular teeth sectioned tillmucosal level post endodontic therapy

Considering the presented situation, patient was given the option for implant supported fixed prosthesis/removable prosthesis, complete dentures and tooth supported over denture without or with attachments. The patient didn't want to go for extensive surgical procedures and wasn't psychologically ready to lose all teeth, hence the option of retaining tooth no. 33,44 and 45 was given to the patient to be used as abutment or as a support for attachment retained overdenture.

Surgical restorative phase:

Patient's consented for the latter, after obtaining the consent extraction of all periodontally compromised teeth was carried out followed by endodontic treatment of tooth no, 33,44 and 45. The retained teeth were shortened till the gingival level. (Fig. 6)

Prosthetic phase:

Maxillary and mandibular primary impressions were made (Y-Dents impression composition, MDM, India) (Fig. 7) followed by custom tray fabrication (Rapid repair, Ashvin,

India) and definitive impressions using zinc oxide impression paste (Impression paste, DPI, India) (Fig. 8)

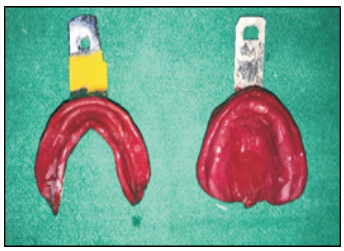

Fig 7 – Primary Impressions

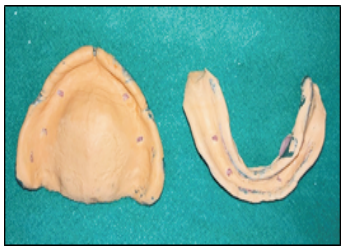

Fig 8 Definitive impressions

Following this wax occlusal rims were fabricated, jaw relations were recorded and try in was done after teeth arrangement. (Fig 9 and 10) This was followed by processing of the denture.

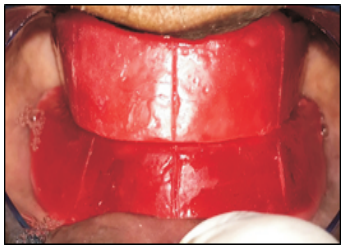

Fig 9 – Jaw relation

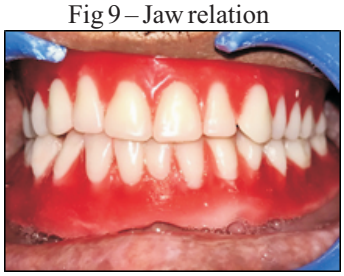

Fig 10 - Try in

Preparation for EDS post for teeth number 33 and 34

Primary drill was first used to prepare the full length of the post hole followed by secondary drill, to prepare a seat for the second tier of the post according to the manufacturer's instructions (AccessPost Overdenture, EDS, U.S.A). (Fig. 11 and 12)

Fig 11 – EDS Access Post Over denture

Fig 12 – Post-space preparation

The posts were then cemented (RelyX U200, 3M, U.S.A). (Fig. 13 and 14)

Fig 13 – Post Cemented

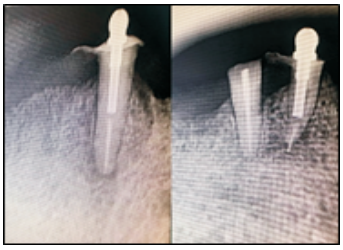

Fig 14 - Radiographs

Space was created, for incorporation of nylon housing, onto the intaglio surface of the mandibular denture after marking them with indelible pencil transferred by the attachment. (Fig. 15)

Fig 15 – Space created for nylon rings (Female components)

Fig 16 – Nylon rings picked up

The nylon housing (female component) was placed on the ball post (male component) and picked up using autopolymerizing resin (Rapid repair, Ashvin, India) placed in the space created in the mandibular denture. (Fig. 16)

Any excess resin flash was trimmed off and the intaglio surface was polished to a smooth finish.

Fig 17 – Post-op Frontal profile

Discussion:

Tallgren, Carlsson and Persson, Crum and Rooney and many other have documented the loss of bone post extraction of teeth also known as RRR. Other than innumerable benefits provided by overdenture, they also have an option of convertibility into a conventional denture if the abutments fail at a later stage.[2]

With all the advantages offered by the overdenture the most pertinent factor that determines the success is careful and meticulous diagnosis and patient selection. Location, age, health of the tooth, endodontic therapy and economics must be considered in each case before starting the treatment.[2] If these points are not taken into consideration failures are bound to happen.

Healthy teeth having a slightly compromised periodontal status can be retained albeit after slight modification to gain biomechanical and psychological advantages. Renner et.al. Also reported that modification of tooth by improving the periodontal condition and decreased crown root ratio to have a positive effect on the abutment by decreasing its mobility.[3]

The attachments used for fabrication of overdenture could either be a stud or bar attachment.[8] Stud attachments have the added benefit of being slightly more resilient than the bar attachment thus transmitting lesser forces onto the abutments. Also when the question arise to choose between prefabricated post attachments and cast attachments, studies have favoured the use of prefabricated ones, for the standardisation and force dissipation they provide.[8] Patient satisfaction was also found to be much better in patients treated with attachment overdentures.[10]

Thus the overdenture with attachment can definitely be viewed as a viable and much more conservative treatment when compared to complete dentures.

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