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Case Report

Specially designed tooth supported mandibular overdenture with enhanced retention

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mandibular overdenture. This article presents rehabilitation of a case with tooth supported mandibular overdenture in which O-ring attachments were used to attach the mandibular overdenture with the existing teeth thus enhancing the amount of retention.

Case report

A 61 year old female patient reported with the chief complaint of multiple missing teeth. History revealed missing teeth were extracted due to caries and periodontal disease around 06 months back. No abnormality detected in the extraoral examination except reduced lower third facial height and unsupported lips and cheeks. Intraoral examination revealed all maxillary and mandibular posterior teeth were missing. Maxillary edentulous arch was completely healed and well formed. Mandibular incisors viz 31, 32, 41, 42 were grade III mobile and 33, 43 were grade I mobile. The posterior edentulous area was U shaped and medium in size with well rounded contour. After explaining various treatment options to the patient, a treatment plan was formulated to preserve 33 and 43 and to make a mandibular overdenture retained by stud attachments against maxillary tissue supported complete denture. Endodontic and periodontal treatment of tooth 33 and 43 was done. Coronal height of the remaining teeth were reduced 3 mm short of marginal gingiva and shaped like a dome. After a waiting period of 4 weeks, the prognosis of the retained teeth with obturated canals and healing of extracted

Introduction

Preventive prosthodontics emphasizes the importance of any procedure that can delay or prevent any future prosthodontic problems. Natural teeth/tooth supported overdentures should be considered to prevent loss of alveolar bone and as an alternative to extraction of all natural teeth.¹ Various studies have shown the rate of resorption of the edentulous mandible is 4 times more than in an edentulous maxilla.² The loss of teeth, especially mandibular teeth, frequently leads to a rapid reduction in the height of the alveolar process.³ In addition, the inherent problems with mandibular CD can be easily overcome by fabrication of tooth/Implant supported

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Fig. 1 – Male component of the O-ring attachment was luted into the intraradicular space.

teeth socket in relation to 31, 32, 41, 42 was ascertained. The male component of the stud attachment was luted using resin cement into the root canal space [Fig. 1].

Primary impressions were made with impression compound in the maxillary arch and with alginate in the mandibular arch. Primary casts were poured with Type II gypsum product. Special tray with spacer was made on the maxillary cast in a conventional manner and two thickness of modelling wax was adapted on the mandibular cast and special tray was fabricated using autopolymerizing resin. Border moulding and final impression of maxillary arch was made using Type II compound and eugenol-free zinc oxide impression paste. Border moulding of mandibular arch was done using heavy body polyvinyl siloxane in single stage technique. Relief holes were placed and impression of lower arch was made with the light body polyvinyl siloxane. Master casts were poured with Type III stone. The male studs in mandibular master cast were blocked out using Type II stone. Permanent denture bases were fabricated. Working casts were poured. Occlusal rims prepared and face-bow recording was done and transferred to the articulator. After determining the vertical dimension, centric relation recording was done. Mandibular cast was mounted using centric relation record. Teeth arrangement was done in balanced occlusion and try-in was done. Dentures were then acrylised in conventional manner.

Window method was used to attach the O-ring attachment housing into the mandibular denture. For this, two holes were

Fig. 2 – Female components of the attachments were placed onto the male components of the attachment.

made in the lower denture where attachments would be located. O ring along with metal housing of the attachments were placed on to the stud portion of the attachment [Fig. 2]. Maxillary and mandibular dentures with holes in the attachment area were placed in the patient's mouth and she was asked to close in order to verify proper occlusion on both the sides. After ascertaining the occlusion, autopolymerizing resin was applied with plastic filling instrument in small increments over metal housing. After polymerization, metal housing along with O ring was picked up in the denture [Fig. 3]. Voids on the intaglio surface of the denture were filled up with autopolymerizing resin. Excess flash, if any was trimmed off. Pressure indicating paste was used on the impression surface of the denture and uniform contact of impression surface of the denture over the ridge was established. Occlusion was adjusted and necessary equilibration was done [Fig. 4]. Post insertion instructions were given and recall visits were done at 24 hr, 1-week and 01 month intervals. During the recall visits, sore points on the denture bearing area were checked and any discomfort was rectified. Post insertion care of dentures was reinforced.

Discussion

Extraction of all natural mandibular dentition and subsequent replacement with a complete mandibular denture is not the most desirable treatment option. Retaining few natural teeth or roots will preserve proprioception, prevent ridge resorption around the retained tooth and give psychological boost to the patient; which will improve the stability and acceptability of the dentures.⁴ Even retention of couple of teeth like mandibular canines for overdenture would give significant improvement in denture retention.⁵ Rissin et al.⁶ have reported that the chewing efficiency of tooth supported overdenture patients are better than the conventional tissue supported dentures.⁷

Proper selection of attachment is key to enhance the retention of the prosthesis. Various factors like inter-arch

Fig. 3 – Using pick-up method, the female component of the attachment was picked up onto the intaglio surface of the lower denture.

Fig. 4 – Occlusion checked and verified for correction.

space, frequent replacement, clinical preference of the operator and cost dictates the selection of attachments.⁸ Stud attachment system utilized in this case uses minimal space and allow movement of the denture. The head was small and incorporation into tooth vis-a vis denture was easy. The metal housing pick up was done at chairside reducing patients appointment and thus reducing the overall cost. The over contoured flange margin seen in other attachment system was minimised due to the small size of the stud attachments.

Conclusion

The overdenture has innumerable advantages and applications compared with conventional complete denture. The success depends upon proper case selection with critical monitoring of various steps involved. Retention of some teeth to fabricate overdenture has been now accepted as a

successful treatment modality compared to extraction of all teeth and fabrication of complete dentures. Modified design with some type of attachments of mandibular overdenture provides all the benefits of overdenture. In addition, it gives more retention which improves the patient compliance and success.

Conflicts of interest

All authors have none to declare.

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