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Case Report

Case Reports on Tooth-Supported Overdenture

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ABSTRACT

Instead of extraction, a clinician can preserve and utilise the remaining teeth of a nearly edentulous patient as abutments for an overdenture. Overdenture can be described as any removable dental prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants. [1] The main advantages of conventional tooth supported overdenture are the preservation of the remaining tooth structure along with its proprioception, preservation of the alveolar bone, additional support to the dentures apart from the mucosa. [2] Particularly for mandibular arch, remaining natural teeth helps in denture support and stability as well. Natural tooth or root supported overdenture is also a cost-effective treatment option. Here we have shown two case reports where patients were successfully rehabilitated with natural tooth supported overdentures with metal copings.

Keywords: Tooth-supported overdenture, Metal coping.

INTRODUCTION

There are many removable and fixed treatment options available for completely edentulous patients. A timely planned root-supported overdenture has been a proven mainstay of preventive prosthodontic therapy as it attempts to conserve the few remaining natural teeth/roots and reduce alveolar bone resorption. In addition to provide an alternative to tooth extraction and complete denture, the root-supported overdenture offers a variety of advantages, including secured prosthesis support, proprioceptive feedback, and economic and psychological benefits. [3,4] Alveolar bone resorbs at a faster rate without the support of natural dentition. Retained roots maintain alveolar bone, which will support an overdenture and prevent rapid bone loss. [5] An overdenture requires careful assessment of the inter-occlusal distance. There must be sufficient space for roots, metal copings and possible attachments, together with an adequate thickness of the denture base material and artificial teeth, all without jeopardizing the strength of the denture. [6]

CASE REPORT 1

A sixty three years old female patient reported to the Department of Prosthodontics and Crown & Bridge of Dr. R. Ahmed Dental College & Hospital, Kolkata with chief complaint of difficulty in mastication. On examination, it was found that multiple teeth were missing in both the arches and she was not wearing any denture. In the lower arch, only left canine and right first premolar were left. Both the teeth had sufficient periodontal support. Class II mod 1 edentulous space was present in the upper arch. Her upper left central incisor was already endodontically treated. Patient was

suffering from osteoarthritis and it was difficult for her to come, so we decided to complete our treatment within a few appointments and as soon as possible. We decided to preserve the remaining lower teeth and fabricate a tooth-supported over denture for the lower arch along with an acrylic removable partial denture for the upper arch. On her first visit, we took diagnostic impressions, fabricated diagnostic casts, surveying the cast, recorded the jaw relations and articulated the casts. We see that adequate inter-occlusal space was available for overdenture fabrication. We also took the pre-operative radiographs of her teeth. On her second appointment, we completed single sitting root canal treatment of lower left canine and right first premolar as the teeth were asymptomatic for long time and there was no peri-apical pathology. Both the teeth were reduced in height to improve crown-root ratio and the abutment teeth were prepared intra-orally with chamfer finish line and in the form of a dome with coronal extension 3-4 mm above the marginal gingiva to receive metal copings. We also took impressions of upper and lower arch for fabrication of primary casts. On the next visit, we cemented the metal copings on the lower teeth. At the same time, we also made the final impressions (by dual impression technique) with the special trays prepared on the primary casts. On the fourth appointment, we registered the jaw relations and on the same day, after teeth setting, try-in was done as well. On the next appointment, we delivered the final dentures (upper removable partial denture and lower overdenture). After 24 hours, she came for check-up. The final adjustments were done on that day.

Figures: 1-pre operative front view;2-upper arch; 3-After reduction of the lower teeth; 4-after placement of metal copings; 5-Final prosthesis; 6-Intra-oral view with dentures in place; 7-Post-operative patient profile.

CASE REPORT 2

Thirty nine years old male patient reported to the Department of Prosthodontics and Crown & Bridge of Dr. R. Ahmed Dental College & Hospital, Kolkata with complain of missing teeth and he wanted to replace them. He lost his most of the teeth due to periodontitis and had difficulty in chewing due to missing teeth. He previously had a removable partial denture. But he was not satisfied with this denture due to bad aesthetic, lack of retention and difficulty in chewing. Extra-oral examination revealed lack of lip fullness and prominent nasolabial farrow. Temporomandibular joints examination

revealed nothing abnormal. Intraoral examination revealed hypo-plastic maxilla with class III ridge relation with mandible and partially edentulous maxillary and mandibular arches. In the maxillary arch teeth 11, 17, 21, 25, 27 were present, whereas in the mandibular arch teeth 34,44, 47 were present. Mobility was present in 27. Mucosa of both the arches was firm in consistency & normal in colour. No sign of inflammation was present. 27 was planned to be extracted. It was planned to fabricate maxillary &mandibular over denture. At first, determination of tentative vertical dimension of occlusion (VDO) was achieved using Phonetics, Swallowing, patient preferences and facial appearance. It was determined that there was loss of VDO (approximately 2 mm).During the following visit, treatment options were discussed with the patient. Intentional endodontic treatment was done in11,21,25,34,44 and short or medium cast copings were given (as the intra-occlusal space was sufficient) .Vital long coping was planned in17.No coping was given over 47. After completion of endodontic therapy, tooth preparations for cast copings were done. Wax patterns of cast copings were fabricated and surveying was done to adjust the copings and establish a single path of insertion. Subsequently casting was done. After proper finishing & polishing, copings were fixed on prepared teeth with help of luting cement. Custom impression trays were fabricated. Border molding was done and secondary impressions were made. Now the face bow transfer done& maxillary cast is mounted in a semi adjustable articular. Jaw relation registration was done. Again VDO was rechecked & final vertical height was confirmed. Protrusive bite registration done & condylar guidance was determined. Selection as well as arrangement of teeth was done. Clinical try-in of properly waxed-up trial dentures was done. Maxillary denture and mandibular overdenture were processed and laboratory remounting was done and dentures were finished and polished. During delivery, dentures immediately improved the aesthetics due to proper lip support. Necessary occlusal adjustments were done. At the recall visit the overdenture was removed carefully and tissues were thoroughly checked for any redness, ulcer etc. Instructions regarding eating, speaking, denture cleanliness were given to the patient.




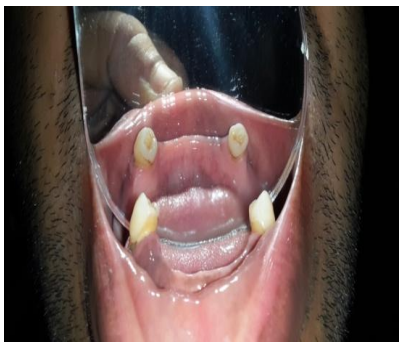

Figure: 1-pre operative front profile;2-pre operative lateral view; 3-pre operative OPG; 4-pre operative intra oral view; 5-tooth preparation of maxillary arch; 6-tooth preparation of mandibular arch; 7-coping placed in mandibular arch; 8-coping placed in maxillary arch; 9-facebow record; 10-teeth setting done in Hanau wide view articulator; 11-denture is delivered;12-post operative lateral view with improvement of aesthetics

DISCUSSION

According to GPT 8, an overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, tooth roots, and/or dental implants. Despite recent development in dental implantology, the conservative approach of root preservation is still valid. Greater emphasis must be given on proper case selection, diagnosis, and treatment planning. Tooth or root supported overdentures are indicated in patients with few remaining natural teeth in an arch. It is also preferred in patients with misrelated ridge cases, patients needing single denture, patients with unfavourable tongue positions, muscle attachments, and high palatal vault, which render the stability and retention of the prosthesis difficult. [7] By preserving the submerged root or teeth for overdenture, alveolar bone resorption can be reduced considerably. Rissin *et al*. in 1978 compared masticatory performance in patients with natural dentition, complete denture and over denture. They found that the over-denture patients had a chewing efficiency one-third higher than the complete denture patients. [5] Additional retention can also be provided in overdenture with help of various attachment systems available depending on the requirements of the clinical case thus adding to improved patient acceptability. [8] But these attachments are costly. In case of bare root overdentures, there are always risks of fracture of the abutment roots. So, here in these cases, we have used metal copings which are comparatively economical solutions. Here abutments were prepared in dome shape contour and received cast copings. These dentures provide mainly the preservation of alveolar bone, maintenance of proprioception and stability of prosthesis. However, if there is requirement of additional retention then variation in design is required. Long copings or attachment can be used to provide additional retention. [8] In case report 1 short coping retained overdenture was planned for the patient to improve denture stability, preserve the alveolar bone and maintain proprioception only as there was no additional retention requirement. In case report 2, some endodontically treated abutments received short or medium coping and remaining vital teeth received long copings. One major

disadvantage of overdentures is related to difficulty in maintenance of oral hygiene. [9] Oral hygiene instructions must be given to the patient and reinforcement of the same has to be done. Recall examinations with radiographs at regular intervals of 6months or less will maintain the prosthetic, restorative, and periodontal status of the patient at acceptable levels, which in turn leads to the success of the overdenture therapy. After abutment loss, an overdenture can be converted into a conventional denture. Overdenture treatment modality is a comparatively expensive approach with frequent recall checkups of the patient than with a conventional removable complete denture.

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