An Indispensable Treatment Modality with Variations: Series of Tooth Supported Overdentures

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ABSTRACT

Excessive occlusal wear and loss of multiple teeth can result in occlusal disharmony, impaired function and esthetic disfigurement. It is not desirable to extract all teeth in case of excessive wear so as to prevent bone loss. Overdenture therapy is essentially a preventive prosthodontic concept which attempts to preserve few remaining natural teeth and/or teeth roots. Despite advancements in dental implantology, several anatomical constraints such as decreased interarch distance can prevent their use in some patients. Also, the proprioceptive mechanism of teeth cannot be compensated by implant overdentures. Hence, the use of teeth supported overdentures can never be obsolete. This case series presents various forms of teeth supported overdentures so as to provide pleasing aesthetics and improved function.

KEYWORDS: Occlusal Wear, Rehabilitation, Tooth Supported Overdenture, Overlay Denture, Vertical Dimension

INTRODUCTION

With advancements in dental implant science, implant supported prostheses are being increasingly used for treating patients. However, anatomical, medical and financial constraints often prevent patients from opting for the best possible treatment. Implant prostheses do not have as much occlusal awareness as teeth.[1] They cannot fully compensate the loss of periodontal sensory mechanisms that guide and monitor gnathodynamic functions. Hence, overdentures have been successfully used for rehabilitation of patients with severe tooth wear and/or few remaining teeth as they provide psychological, functional as well as biological advantages to the patients.

Stud attachments in overdentures have gained wide popularity in clinical practice due to their simple application. However, in patients with decreased interarch distance and presence of tissue undercuts, the use of any attachment may become difficult. An increase in the vertical dimension of occlusion to restore the dentition is not desirable since it would cause an increase in the crown to root ratio without altering the root support.[2] With increased crown root ratio, the centre of rotation moves apically and the tooth is more prone to the harmful effect of lateral forces.[3] Similarly, the presence of multiple teeth with severe wear may not permit fabrication of an attachment overdenture. This clinical case series describes three patients treated with overlay denture, overdenture with copings and overdenture with stud attachment respectively, while providing optimum aesthetics and function.

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CASE SERIES

Case Report I

Rehabilitation of a patient with overlay dentures

A 25 year male patient reported with the complaint of inability to chew food properly and poor facial appearance due to severe wear of teeth. There was no relevant medical history affecting prosthodontic treatment. Loss of facial support was evident (Fig No.1). On clinical examination, teeth present were 11, 12, 13, 18, 21, 22, 23, 24, 25, 27, 31, 32, 33, 34, 38, 41, 42, 43, 44, 45. Generalized attrition was present except 11, 18, 25, 27 and 38. Excessively reduced interocclusal distance, rotated 25 and mesially inclined 38 were noted. Endodontic treatment was done for all but 11, 18, 25, 27, 38 and 45. Considering patient's complaints and intraoral condition, specifically the decreased interarch distance, an overlay denture was planned (Fig No.2).

Fig No.1: Preoperative photograph showing loss of facial support.

The treatment plan included endodontic phase, surgical phase and prosthodontic phase. Endodontic phase involved intentional endodontic treatment with 11, 25, 45 and surgical phase involved extraction of mesially inclined 38. After one month, prosthodontic phase was started. This included abutment preparation (except 18 and 27) till gingival margin followed by overlay dentures (Fig No.3 and Fig No.4). The patient was most satisfied with the change in his appearance. Most noticeably, the patient's attitude and disposition had changed (Fig No.5).

Fig No.2: Teeth in occlusion showing decreased interarch distance.

Fig No.3: Tooth modification- Maxillary arch.

Fig No.4: Tooth modification- Mandibular arch.

Fig No.5: Postoperative photograph of patient

Case Report II

Rehabilitation of a patient with mandibular overdenture and maxillary complete denture.

A 51 year male patient reported with the complaint of inability to chew food properly due to loss of multiple teeth. On clinical examination, maxillary arch was edentulous, well formed, U-shaped with firm and resilient mucosa and pigmentations due to smoking. Teeth present in mandibular arch were 34, 35, 43 and 45. Canine exhibited gingival recession and grade I mobility. Other teeth were periodontally sound. (Fig No.6) All four prospective abutments were buccally inclined resulting in unfavorable tissue undercuts.

Fig No.6: Remaining abutments.

The maxillomandibular relation showed that the interarch distance was inadequate in the region of 34 and 35. No attachment system could be used without altering the occlusal plane and without increasing the vertical dimension. Hence, the treatment plan included intentional endodontic treatment with all teeth followed by maxillary complete denture and mandibular overdenture with copings (Fig No.7 and Fig No. 8). The dentures provided desirable aesthetics and function (Fig No.9)

Fig No.7: Teeth prepared to receive copings.

Fig No.8: Copings cemented.

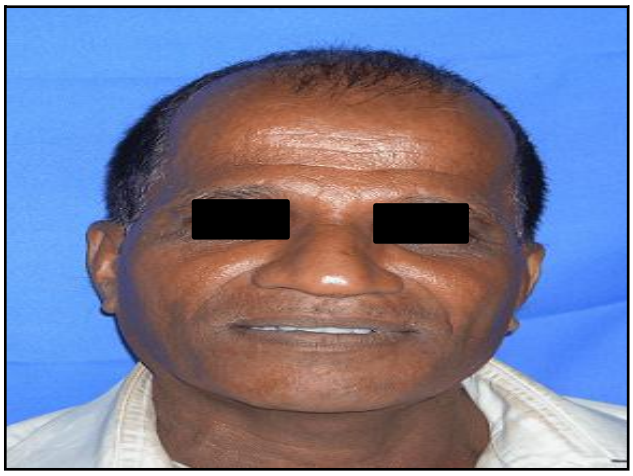

Fig No.9: Postoperative view

Case Report III

Rehabilitation of a patient with mandibular overdenture using intra-radicular stud attachments and maxillary removable partial denture.

A 37 year female patient reported with chief complaint of repeated breakage of lower denture. The patient was using mandibular overdenture supported by long copings on 33 and 43 but with inadequate occlusal clearance (Fig No.10).

Fig No.10: Previous long copings

This led to thinning of dentures over the abutments leading to subsequent fracture. Teeth missing in maxillary arch: 16, 17, 18, 23, 26, 27. Considering patient's financial condition, the treatment plan included removal of long copings and abutment preparation to receive intra-radicular stud attachments followed by fabrication of mandibular overdenture and maxillary removable partial denture. AccessPost overdenture system (Prime Dental Products Pvt. Ltd.) was selected for this patient as it provided improved stability, retention and cost effectiveness (Fig No.11, Fig No.12 and Fig No.13). The designed prosthesis served as an esthetic and functional solution in the management of this patient (Fig No.14). The patient could particularly experience the difference in the fit of denture.

Fig No.11: AccessPost overdenture system.

Fig No.12: AccessPost cemented

Fig No.13: Nylon Caps placed on abutments.

Fig No.14: Post-prosthesis smile of patient

DISCUSSION

Despite recent developments in dental implantology, the conservative approach to root preservation followed by an overdenture is still valid. The many advantages of root retention include preservation of the residual ridge, retention, support and stabilization for the denture base, proprioceptive feedback and psychological benefit to the patient. The masticatory performance in patients with overdentures is also higher than the complete denture patients.[4] The use of overdentures is therefore, a practical alternative that provides a relatively quick, easy and cost-effective solution to the functional and esthetic oral rehabilitation in patients with pronounced edentulism and/or severe wear. Various challenges presented to the operating dentist include periodontally compromised teeth, presence of undercuts, restoring vertical dimension, satisfy the patient's aesthetic desires, while also fulfilling occlusal and functional parameters that are essential for long-term success. Hence, a multidisciplinary approach is necessary to fulfil the patient's need with most suitable modality of treatment.

Healthy teeth with compromised periodontal status can be modified and retained for biomechanical and psychological advantages.[5] Tooth modification by means of improved periodontal health and increased crown root ratio can positively affect the mobility as reported by Renner et al.[6] This preventive approach can be achieved by means of overdentures. Various techniques used in treatment of teeth ranges from simple tooth modification and reduction, tooth preparation with cast coping to endodontic therapy or utilizing some form of attachments. This series presents three cases, one of each category where the treatment plan was primarily decided by the amount of interarch distance. It can be observed that pleasing aesthetics was achieved in all the cases. All the patients reported improved appearance and function after using the prosthesis. The success or failure of overdenture hinges on continued preservation of the underlying abutments. Many elderly patients lack the dexterity to adequately clean their teeth.[7] Hence special attention towards meticulous oral hygiene practices and regular recall appointments are critical in the success of overdenture therapy.

CONCLUSION

An overdenture is a practical and viable treatment alternative to conventional complete denture. Selection of appropriate abutments, multidisciplinary team approach and patient education is the "triad" which determines the outcome of treatment and post prosthesis quality of life of the patients.

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