

A Maxillary Conventional Complete Denture Opposing a Bar Retained Mandibular Overdenture: A Case Report

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Abstract

Clinical decision making in the case of a partially edentulous patient with only a few teeth remaining is a challenge. There is always a social and psychological fear of being edentulous after the extraction of remaining teeth. When few firm teeth are present in an otherwise compromised dentition, they can be retained and used as abutments for overdenture fabrication. The concept of conventional tooth-retained overdentures is a simple and cost effective treatment than the implant overdentures. Custom bar supported overdenture is a good treatment modality because of its improved retention, stability, better chewing efficiency and decrease in alveolar bone resorption. It also prevents the patient from the anxiety and distress associated with the extraction of remaining teeth

Key words: *overdenture, immediate overdenture, bar supported over denture, bar overdenture, bar attachment.*

Introduction

DeVan golden statement: “Perpetual preservation of what remains is more important than the meticulous replacement of what is missing” still rings true. Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems and overdenture is an important part as the preventive treatment modality. An overdenture delays the process of resorption, improves denture foundation area and increases masticatory efficiency.[1]

According to GPT 8, 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. It is also called as overlay denture, overlay prosthesis and superimposed prosthesis.

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Bar Overdenture

A bar overdenture is an excellent prosthetic option that many patients choose over other treatment modalities for a number of reasons like having more retention than a conventional denture, providing better support than a tissue-supported prosthesis, functioning better because it is more stable and moves less, being more comfortable to the patient. Although there are some prerequisites for the patient to be a candidate for a bar overdenture. There must be an interarch space of about 15 mm, but in case there is not enough space, an alveoloplasty would create the space necessary if the ridge height permits.

Attachments used to retain overdenture prostheses are classified according to shape as stud and bar. Stud attachments are probably the simplest of all attachments; they connect the overdenture to individual roots for increased retention of the prosthesis. Bar attachment retainers have the dual role of acting as splints for roots spanning the edentulous space and providing overdenture retention. Because the bar is positioned close to the mandibular alveolar bone, torquing forces applied through the bar will be less than the torquing forces applied through the occlusal rests of a mandibular removable partial denture.

Case Report

A 66-year-old patient female reported to the Department of Prosthodontics in Rural Dental College to get her

missing teeth replaced. She had a completely edentulous maxillary arch (Fig.1). Mandibular arch was partially edentulous with Kennedy Class I modification 1. 33, 34, 44 and 45 were present (Fig.2). The patient gave a history of loss of her missing teeth over a period of 15 years due to multiple caries and periodontal problems. She had worn two treatment removable partial dentures during that period. No mobility and periapical pathology was noticed in the clinical and radiographical examination. The patient wanted prosthesis with good retention as compared to her previous dentures.



Fig.1 Intra oral maxillary photograph



Fig.2 Intra oral mandibular photograph

Procedure

1. Maxillary impression was made with impression compound similar to conventional complete denture.(Fig.3)
2. Mandibular impression was made with irreversible hydrocolloid impression material (alginate) (Fig.3)
3. Primary cast were poured in gypsum products.

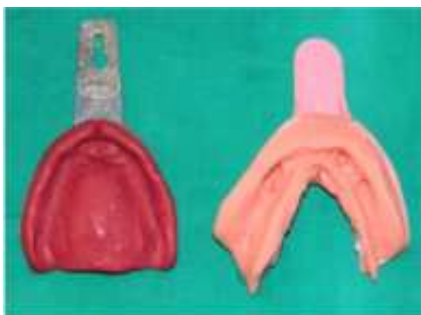


Fig.3 Maxillary and mandibular preliminary impression

4. Maxillary border moulding and final impression was made by low fusing compound and light body elastomeric impression material. (Fig.4)



Fig.4 Maxillary border moulding and final impression

5. Record base made of self cure acrylic material was made on mandibular primary cast with perforation in teeth region.
6. Maxillary and mandibular wax rims were prepared.
7. A tentative jaw relation of the diagnostic casts was done to assess the inter-arch space. It was found to be sufficient for an overdenture with short copings. (Fig.5)



Fig.5 Tentative jaw relation

8. After intentional root canal of 33, 34, 44 and 45.They were prepared with tapered round end diamond point with chamfer finish line made supragingivally.
9. Impression was made and working cast obtained in Type - III gypsum product (dental stone) (Fig.6)



Fig.6 Cast working after tooth preparation

10. Wax up done for fabrication of coping on 33, 34, 44 and 45 while bar connecting 33 and 44. Casting was completed. (Fig.7)



Fig.7 Copings and bar casted in metal alloy

11. Casting was verified intraorally for proper fit and adaptation. (Fig.8)



Fig.8. Try in of metal coping and bar

12. Mandibular border moulding was done with low fusing impression compound (green stick) and final pickup impression of bar retained prosthesis was made in light body elastomeric impression material. (Fig.9)



Fig.9 Mandibular border moulding and final impression

13. Bar retained copings were removed from impression and master cast was poured in Type III gypsum product (dental stone). (Fig.10)
14. Copings cemented on 34 and 45, and bar retained prosthesis cemented using GIC luting cement



Fig.10. Mandibular final cast

15. Face bow recording done and transferred on semi adjustable articulator (Hanau vide vu) (Fig.11)



Fig.11 Face bow transfer

16. Teeth arrangement was done and Esthetics, occlusion and denture borders were verified and corrections were made accordingly during try in. (Fig.12)



Fig.12 Teeth arrangement

17. Denture was fabricated in high strength heat cure acrylic material. Finishing and polishing is done and overdenture was inserted. (Fig.13)
18. Patient was given all the post-insertion instructions and was recalled for follow up.



Fig.13 Denture insertion

Discussion

Edentulism results in loss of proprioception, progressive irreversible alveolar bone loss, the transfer of all occlusal forces from the teeth to the oral mucosa, and esthetic impairments. By retaining natural teeth for an overdenture, we can preserve some of sensory inputs from the periodontal mechanoreceptors which are more precise than that obtained from the oral mucosa. These periodontal receptors by their proprioceptive feedback mechanism actively influence muscles of mastication and thereby the cyclic temporomandibular joint movements[2].

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.[3]

Considering these factors an immediate over denture and/or bar retained over denture is planned for the patient who provides simplicity of fabrication, ease of maintenance, stability, retention and good patient response. More importantly it helps in the preservation of the remaining oral structures (as a result of distribution of forces)[4].

The use of the straight bar joint offers periodontally involved teeth an improved crown-to-root ratio and splinting of the teeth. Because the bar is close to the alveolar bone, forces of mastication exert much less leverage to the teeth [5]. Finally, the bar joint offers slight vertical and rotational movement of the denture as well as a stress breaker action because of resiliency provided by plastic sleeve. Bar exhibited more cross-arch involvement than the Zest anchor and allowed occlusal forces to be shared between the abutments. Retention of bar can be increased by increasing the number of plastic sleeve used and is limited by the length of the bar. Immediate overdenture patient should be motivated to properly maintain the retained teeth with home care and understand the importance of periodic follow-up care by the dentist[6].

Advantages: [2,4,7,8]

1. Preservation of alveolar bone
2. Proprioception
3. Enhanced stability and retention
4. Maintenance of vertical dimension of occlusion.
5. Useful for patients with congenital defects such as oligodontia, cleft palate, cleidocranial dystosis and Class III occlusion
6. Can be easily converted to complete denture over a period of time.
7. Psychological benefit of having his own teeth

Disadvantages

1. Meticulous oral hygiene is pertinent in order to prevent caries and periodontal disease
2. Bulkier and overcontoured
3. Encroachment of inter-occlusal distance
4. Expensive treatment modality than a conventional removable complete denture.

Conclusion

These days implant treatment has become the norm, thus tooth supported overdentures have taken a backseat as a result of competitive commercialization of implants.[9] The success of the tooth-supported overdenture treatment depends upon the proper attachment selection for the particular case. Various factors for attachment selection include available buccolingual and inter arch space, the amount of bone support, opposing dentition, clinical experience, personal preferences, maintenance problems, cost and most important being patient's motivation. Careful selection of the strategic abutment is important. The decision must first be made to retain the teeth as overdenture abutments and then the attachments should be planned. The attitude of the patient to the treatment should be assessed. Only those who understand the limitations and benefits of attachments should be treated with attachment retained overdentures. Hence, patient selection is critical to the success of the treatment.

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