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Salvaging The Alveolar Bone Using Tooth Supported Overdentures – A Case Report

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Abstract

The psychological effect of losing all his teeth can be very disturbing and stressful for a patient. It brings down patient's morale and is a continuous reminder of his dependency on others. In such conditions, over denture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages. In case of over denture prosthesis, proprioception is maintained, there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity.

Keywords: Overdenture, alveolar bone, proprioception.

Introduction

Overdenture is a favoured treatment modality for elderly patients with few remaining teeth. Roots maintained under the denture base preserve the alveolar ridge, provide

sensory feedback and improve the stability of the dentures.¹

Overdenture treatment uses a removable complete denture that overlies retained teeth, tooth roots, or dental implants. This treatment is not a new concept and practitioners have successfully employed existing tooth structures or retained roots to assist with complete denture treatment for more than a century.^(1,2)

According to Glossary of Prosthodontic terms-8 An Overdenture is defined as:

“A removable partial denture or complete denture that covers and rests on one or more remaining natural teeth, the roots of natural teeth and /or dental implants.”

An overdenture delays the process of resorption, improves denture foundation area and increases masticatory efficiency.³

According to a study by CRUM and ROONEY- by retaining mandibular canines and its use in overdentures- resorption decreased by 8 times. The results of the 5 year clinical study showed that patients treated with complete maxillary dentures and mandibular overdentures demonstrated less vertical alveolar bone reduction than patients with conventional complete maxillary and mandibular dentures.⁴

MM De Van's golden statement – "Perpetual preservation of what remains is more important than meticulous replacement of what is missing" completely relates to the concept of overdentures.

Coronally modified or restored retained teeth abutments are frequently endodontically prepared and are used as abutments for an overdenture. The objective is to distribute stress concentration between retained abutments

and denture – supporting soft tissues. Retained root abutments can give better retention, support, and stability to a overdenture and also add to the advantage by providing proprioception which would otherwise be lost with conventional complete denture treatment.^(5,6)

Overdentures are contraindicated in patients with questionable oral prophylaxis, systemic complications, and inadequate interarch distance.

Case Report

A 72-year-old female patient reported to the Department of Prosthodontics, Bharti Vidyapeeth Dental College and Hospital with the chief complaint of difficulty in chewing due to missing teeth. There was no relevant medical history affecting prosthodontic treatment. Intraoral examination revealed well formed maxillary and mandibular ridges in class II ridge relationship (Fig.1a, b).

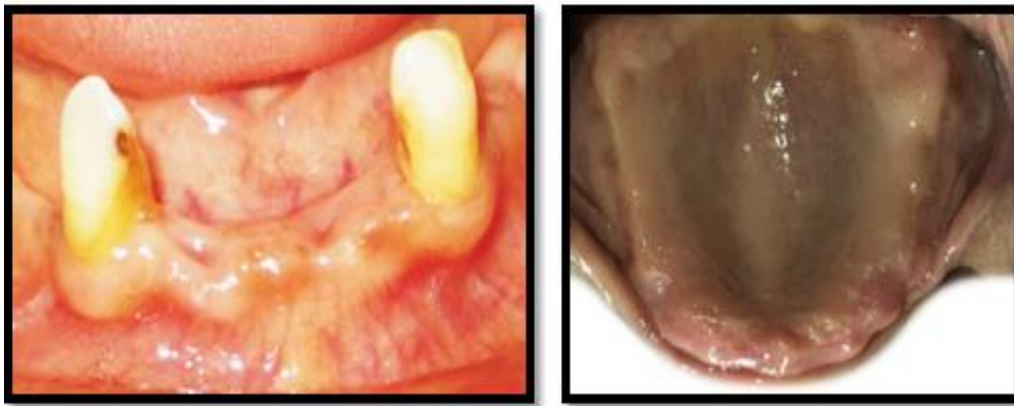


Fig.1a, b Pre-operative intraoral photographs of maxillary and mandibular arch

Only 33 and 43 were present in the mandibular arch and radiographic examination revealed good bone support and long roots. The different treatment options available for this patient's mandibular arch were— extraction of the remaining teeth followed by conventional complete denture, implant supported overdenture and tooth supported overdenture. Patient chose tooth supported overdenture as the treatment option.

An orthopantomogram (OPG) and diagnostic casts were made. Wax rims were fabricated on diagnostic casts to determine the approximate vertical dimension of occlusion. Vertical dimension recordings were determined by phonetics and aesthetics. The diagnostic articulation helped in assessing the available inter-arch space and was found to be adequate. Elective endodontics was carried out with teeth 43 and 33 and they were prepared in a dome-shaped contour and hemi spherically rounded in all

dimensions with approximately 3–4 mm projecting just above the gingiva (Figure. 2).



Fig.2 Tooth Preparations done on 33 and 43

Post space was prepared and impressions with indirect method (putty relined technique) were made for fabrication of dome shaped cast metal short copings (Fig.3a,b)



Fig.3a, b Post space preparation and impression

The fabrication of the post-coping patterns and casting was completed in the laboratory (Figure. 4)



Fig.4 Cast metal(Ni-Cr) copings

The copings were finished and polished and tried in the patient's mouth and the radiographs were taken.

Following which, they were luted to the abutment teeth using GIC luting cement (Figure. 5)



Fig.5 Cast metal(Ni-Cr) copings cemented

Primary impressions of the upper and lower arch were made with Impression Compound and special trays were fabricated on the primary casts after block out. Using

conventional techniques border moulding was done and secondary impression was made with medium viscosity rubber base material (Polyether pentamix) (Fig.6a, b)

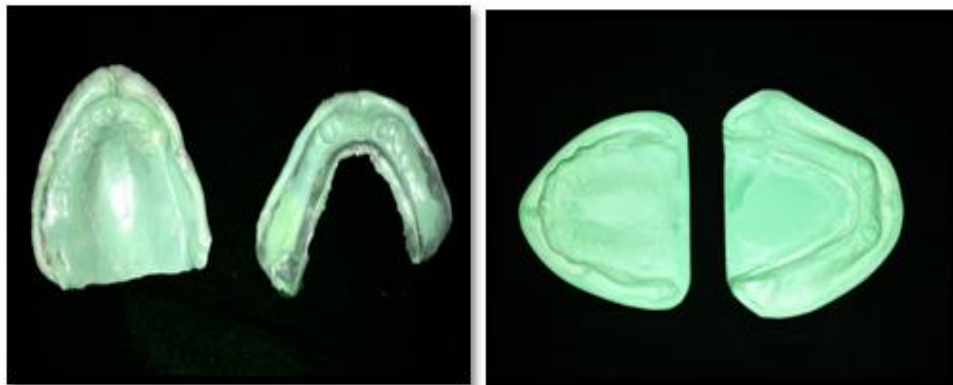


Fig.6a,b Final impressions and Master casts

Record bases and rims were made and the jaw relationship was recorded. Teeth arrangement was done and a try-in

was accomplished (Figure. 7).



Fig.7a,b Waxed up denture try-in

After a satisfactory try-in, the waxed up denture was processed using heat cure acrylic (Fig. 8)



Fig.8a intaglio surface of mandibular overdenture

Fig.8b,c Denture insertion

Discussion

The psychological effect of losing all his teeth can be very disturbing and stressful for a patient. It brings down patient's morale and is a continuous reminder of his dependency on others. In such conditions, overdenture option as preventive prosthodontic treatment modality should be regularly imbibed in our dental practices because of its innumerable advantages.

In case of overdenture prosthesis, proprioception is maintained, there is the presence of directional sensitivity; dimensional discrimination; canine response and tactile sensitivity.⁷

Crum and Rooney graphically demonstrated in a 5 years study an average loss of 0.6 mm of vertical bone in the anterior part of the mandible of overdenture patients through cephalometric radiographs as opposed to 5.2 mm loss in complete denture patients.⁴

Miller⁸ in his study concluded that alveolar bone resorption depends upon

Three variables which are

1. The character of the bone.
2. The health of the individual.
3. The amount of trauma to which the structures are subjected.

Advantages of conventional over denture

- Feels more like having teeth
- More retention in many cases
- Helps to reduce shrinkage of surrounding alveolar bone
- Reduces pressure on portions of the alveolar ridge
- Positive psychological advantage of still having teeth.

Rissin *et al.* in 1978 compared masticatory performance in patients with natural dentition, complete denture and overdenture. They found that the over-denture patients had a chewing efficiency one third higher than the complete denture patients.⁹

It has been proved that reducing abutment to 1.5-2 mm above gingival margin reduces the crown-root ratio and thus reducing mobility by 40%.¹⁰

In the case report described above, cast metal short small coping with the intra-radicular post was selected as the treatment of choice. This treatment option was selected to ensure patient comfort by improved retention, stability and support. Proprioception will be maintained and thus mandibular ridge resorption will be prevented.

Conclusion

An overdenture has innumerable advantages and applications as compared with conventional complete denture. A tooth supported Overdenture has been an conventional but long term accepted treatment modality incorporating Preventive Prosthodontics concepts to the core. For successful treatment outcomes it is necessary to understand and acknowledge the basics and inculcate them in daily clinical practice.

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