TOOTH SUPPORTED MANDIBULAR OVERDENTURE: A FORGOTTEN CONCEPT

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ABSTRACT

Clinical decision making in the case of a partially edentulous patient with only few teeth remaining is a big challenge. Despite recent development in dental implantology, the conservative approach to root preservation followed by an overdenture is still valid. Few teeth remaining can be retained and used as an abutment for overdenture fabrication. This helps to improve retention and stability of the final prosthesis significantly, alveolar bone is maintained, helps to achieve better prosthetic support, proprioceptive feedback, better masticatory efficiency, aesthetics and psychological benefits. This paper presents a case report of rehabilitation of a partially edentulous patient with a tooth supported mandibular overdenture.

KEYWORDS: Overdenture, Preventive Prosthodontics, Proprioceptive, Copings

INTRODUCTION

De Van golden statement, “perpetual preservation of what remain is more important than meticulous replacement of what is missing” still rings true. Overdenture is definitely a better option as compared to removable complete denture prosthesis.1

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 overlay denture, overlay prosthesis and superimposed prosthesis.

In a four year study by Renner et al, it was found that 50% of the roots used as overdenture abutments remained immobile.2

Overdenture offers many advantages over conventional complete denture. The most important benefits are preservation of alveolar bone, proprioception, enhanced stability and retention and improved masticatory efficiency. Thus, overdentures are more beneficial as they provide psychological, functional as well as biological advantage for the patients.3 Rissin et al in 1978 compared masticatory in patient with natural dentition, complete denture and overdenture. They found that overdenture patient had chewing efficiency one third higher than complete denture patient.
This paper presents a case report of a partially edentulous patient rehabilitated with mandibular tooth supported overdenture.

CASE REPORT

A 61 year old patient came to the Department of Prosthodontics in Gian Sagar Dental College & Hospital with chief complaint of difficulty in chewing food due to missing teeth.

There was no relevant medical history affecting prosthodontic treatment. Extraoral examination showed no gross abnormality. On intraoral examination, in maxillary arch 11, 13, 14, 15, 21, 24, 25 teeth were present. 11 and 21 were grade III mobile, rest of the teeth were firm (grade I). In mandibular arch 33, 43, 36 teeth were present 33 and 43 were firm and RCT treated 36 was grade III mobile and badly carious. Mandibular ridge was severely resorbed.

TREATMENT PLANNING

The different treatment option available for the patient were

- Extraction of all remaining teeth followed by conventional complete denture in both maxillary and mandibular arch.
- Total extraction followed by implant supported overdenture in both the arches.
- Tooth supported overdenture in mandibular arch opposing partial denture in maxillary arch.

Because of economical reasons, option C was chosen, 11, 21 and 36 were extracted and it was planned to use the remaining teeth in mandibular arch as abutment to fabricate an overdenture opposing maxillary partial denture. The location (43, 33) was favourable for an overdenture. Diagnostic impression with alginate (Figure 1) was made and a tentative jaw relation of diagnostic casts made from alginate impression was done to assess the interarch space.

![Figure 1: Diagnostic Impression of Maxillary and Mandibular Arch](image)

It was found to be sufficient for an overdenture with simple tooth modification. The abutment teeth were reduced in vertical height to 2mm above the crest of the ridge and rounded to minimize the torque. (Figure 2)
Elective Endodontics was carried out of 43 and 33. Preparation of the post space was done 4mm short of the apical length. Custom – post patterns were fabricated directly in the root canal with pattern resin and then, pick- up impression was made using rubber base impression material. The impression was poured in die stone. The copings were dome shaped and fabrication of these post-copings patterns was completed in the laboratory. Custom ball attachments were made from pattern resin and were attached to the copings. The diameter of the custom ball attachment was similar with that of diameter of orthodontic separators. The casting was done in a conventional manner. The finished copings along with the attachments were tried in the patient’s mouth. After confirming the fit, they were luted onto the abutment teeth.(Figure 3)

A primary impression of mandibular impression was made. Border moulding was carried out after fabricating special tray. Final impression was made with rubber base impression material. Occlusal rims were made and jaw relation recorded. Teeth arrangement was made and try in was done. Maxillary partial and mandibular complete denture were fabricated using conventional method. Finishing and polishing was done in an usual manner. To create a space for attachment, vent holes were created in the mandibular denture. Orthodontic separators were placed over the custom ball attachment. The separators were picked up by adding autopolymerising acrylic resin in the space while maxillary removable partial prosthesis and mandibular complete denture was in patient’s mouth. (Figure 4)
Excess autopolymerising acrylic resin was removed at the vent region. Repolishing was done at that region. The instructions were given to the patient regarding the care and maintenance of the prosthesis.

**DISCUSSIONS**

Fabrication of tooth supported overdenture is a step in direction of preventive Prosthodontics.

The literature reports that in the elderly population it is common to observe poor dentition affected by periodontal disease and dental caries. In certain situations, the patient is limited to being rehabilitated with complete dentures due to the fact that no other options are available. However, the use of selected periodontally healthy strategic positions can greatly improve the final treatment result in terms of overdenture stability and retention.  

An overdenture requires careful assessment of the interocclusal 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 fracture resistance of the denture.

Crum and Rooney graphically demonstrated in 5 year 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 of bone loss in complete denture patients.

According to Robert L Defranco tooth supported overdenture accomplishes three important goals. Firstly, it maintains the abutment as a part of the residual ridge which in turn provides more support than a conventional complete denture. Secondly, when teeth are retained the alveolar bone integrity is maintained as they support the alveolar bone. However when teeth are removed, alveolar bone resorption process begins. Thirdly, with the preservation of teeth there is also preservation of the periodontal membrane and this in turn preserves proprioceptive impulses resulting in better occlusal awareness, biting forces consequent neuromuscular control.

Tallgren concluded that anterior mandibular height resorbed 4 times faster than maxillary ridge with conventional denture. It was concluded in a 5 year study that retention of mandibular canine for overdenture led to the preservation of alveolar bone.

Overdentures are useful for patients with congenital defects such as oligodontia, cleft palate, cleidocranial dystosis and class III occlusion. They can easily be converted to complete denture over a period of time. Various advantages of overdenture are improved retention and stability of final prosthesis, maintenance of alveolar bone, proprioceptive feedback, aesthetics and psychological benefits.

In this particular case mandibular canine were used as abutment for overdenture. This is so because it exhibits better characteristics associated with support due to its large root with greater periodontal area for attachment and also due to its localisation in the transition area between anterior and posterior teeth. Studies showed that anterior teeth exhibit more sensitivity and discrimination of forces than posterior teeth. By retaining mandibular canine in overdenture, the resorption of the alveolar bone surrounding the teeth was reduced by eight times.

Kruger and Michael in 1962 found that canine had more neurons than any other teeth and they are the most important proprioceptive organ.

In clinical routine practice overdenture should be considered as treatment modality for the patient with few teeth remaining because of the above advantages. Thus overdenture is a ray of hope for such patients.
REFERENCES


