Conventional Overdenture Technique: An Evergreen Prosthodontic Treatment Solution for edentulous patients: A Case Report

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Abstract
Preservation of alveolar bone is the main aim of conventional tooth-retained overdenture. In the past when patients reported for a denture with teeth that were badly broken down with periodontal involvement or due to large carious lesions, those teeth were extracted that could have been retained under more favourable conditions. Retention of the roots of one or more teeth for overdenture offers the patient a lot of advantages like better stability, proprioception, support among a few. The following case report focuses on the merits of using selectively retained roots and abutments to minimize alveolar ridge resorption below the complete dentures.

Keywords: Conventional Overdenture, Ridge Resorption, Metal Copings

1. Introduction
Complete edentulous state can substantially affect oral and general health as well as overall quality of life. Patient satisfaction with dentures is influenced by various factors including denture quality, the available tissue support, the dentist–patient rapport, experience with existing dentures, patient’s personality and psychologic wellbeing. Replacing the missing structures by means of complete dentures is challenging both for the dentist and the patient. Nevertheless, some people do not succeed in acquiring new skills with their dentures and thus suffer psychologically because of impaired function, comfort, self-image and social interaction. Hence over denture treatment has been available for decades, this treatment, however, is more comfortable compared to the conventional complete denture prosthesis1.

1.1 Definition
G P T 2008 -Any removable dental prosthesis that covers and rest on one or more remaining natural teeth, the roots of natural teeth and/or dental implants2.

1.2 Rationale of Overdentures
Rationale of an overdenture is to preserve a portion of one of the major sensory inputs i.e. input from the periodontal proprioceptors, which contain information about the magnitude and direction of the occlusal forces as well as about the size and consistency of the food bolus. This along with the input of other receptors in the mouth, muscles, TMJ
contributes to the overall response. The periodontal receptors input are also protective against occlusal overloading\textsuperscript{3,4}.

1.3 Indications\textsuperscript{3,5,6}

i. Overdentures are indicated when the result of the treatment would be equal to or superior to another line of treatment.

ii. Few remaining healthy teeth with adequate periodontal support is also another indication for overdentures.

iii. Other indications would be poor prognosis for complete dentures such as High palatal vault, poorly defined sublingual fold space, poor residual ridge in edentulous areas, xerostomia or sialorrhea, Loss of a maxilla or partial loss of mandibular ridge and congenital deformities especially the cleft palate.

iv. Teeth with questionable prognosis can be used as abutments for an over denture and later, if lost, denture base can be relined.

1.4 Contraindications\textsuperscript{3,5,6}

i. Periodontally weak teeth, which cannot provide support for the denture.

ii. Soft tissue and osseous defects which cannot be corrected by surgery.

iii. Patients with poor oral hygiene.

iv. When a patient cannot accept anything other than a complete denture psychologically.

v. Contraindications for endodontic treatment such as vertical fracture of root or roots, mechanical perforation of root, internal resorption, broken instrument in root canal and horizontal fracture below bony crest.

1.5 Advantages\textsuperscript{4,5,}

i. It is an equally effective or superior method of treatment.

ii. Retaining the teeth helps in preservation of the alveolar bone surrounding it.

iii. Overdentures provide a certain degree of proprioception which cannot be expected from complete / partial dentures.

iv. The natural tooth stops provide for stable and static base.

v. Patients with congenital defects, such as, left palate, partial anodontia, microdontia, amelogenesis imperfecta etc. can be successfully treated with an overdenture.

vi. Adequate retention is easily attained by overlaying the teeth.

vii. Stability attained is greater than the conventional removable dentures.

viii. Easy maintenance of the periodontium can be done as the overlay prosthesis can be removed.

ix. Patient acceptance is also greater as few teeth are retained and over denture results in better proprioception, retention, stability and support.

x. Convertibility – Overdentures are designed in such a way that even though the abutment teeth maybe lost, the overdenture can be transformed into a conventional Denture by rebasing or relining.

xi. With retained teeth, jaw relation records can be made more accurately as the abutment teeth will help in more stable denture bases.

1.6 Disadvantages\textsuperscript{4,5}

i. The construction of an overdentures is costlier due to the endodontic therapy required and the subsequent restoration of there teeth with alloys or gold copings.

ii. Bony undercuts: Due to the retained teeth, there are limited paths of insertion. This will lead to the blocking out of undercuts resulting in denture flange spaced away from the tissue, creating a food trap.

iii. Caries susceptibility: If proper maintenance of the abutment teeth is not done, the roots will undergo either carious or periodontal breakdown resulting in the loss of the tooth.

iv. Sometimes because of the undercuts, the denture will be overcontoured resulting in excessive fullness of the lips. At other times the denture flanges will be undercontoured for it to fall into place. Therefore proper patient selection is required.

v. Sufficient inter ridge space is essential.

vi. An overcontoured flange which disturbs the natural fullness of lip can cause compromised esthetics. This overcontoured flange would be the result of blocking out of anterior undercuts which would interfere with the placement of the denture. If the problem is severe enough it may contraindicate an overdenture.

2. Clinical Report

A 66-year-old male patient reported with the chief complaint of difficulty in chewing food. On extra-oral examination patient had a convex profile. Intra-oral examination revealed remaining maxillary right canine (Figure: 1a) and
mandibular canines and right molar (Figure: 1b). After clinical and radiographic evaluation the suggested treatment was to retain the maxillary and mandibular canines and mandibular molar on which an overdenture was planned. This would increase the retention, stability and support of the prosthesis.

**Figure 1(a): Intra Oral View of maxillary arch and mandibular arch**

**Figure 1 (b): Intra Oral View of mandibular arch**

**Procedure:** The remaining teeth were endodontically treated since the crown root ratio was not favourable and was encroaching interocclusal the space in denture fabrication. Once the teeth were asymptomatic, teeth were reduced in size for more favourable crown root ratio. Dome shape preparation with chamfer finish line was done for all the teeth. Impressions were made and wax pattern was made with inlay casting wax. Once the metal copings were fabricated, (Figure: 2a) they were polished and cemented using Glass ionomer luting agent (Figure: 2b).

**Figure 2 (a) : Master casts with copings in place**

**Figure 2 (b): Cemented copings**

The impression techniques follow the same principles and procedures that are used in constructing a conventional complete denture. Preliminary impressions were made and special trays fabricated. Maxillary and mandibular impression was made using zinc oxide eugenol paste (Figure:3). Conventional complete denture construction procedures were followed for fabricating maxillary and mandibular complete dentures (Figure:4).

**Figure 3: Secondary Impression**

**Figure 4: Denture Placement**
3. Discussion

Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future problems. The basic overdenture concept requires preservation of residual hard and soft tissues. Tallgren concluded that anterior mandible height resorbed four times faster than maxillary ridge with conventional dentures. It was concluded in a 5-year study that retention of mandibular canines for overdentures led to preservation of alveolar bone. The overdenture patients had a chewing efficiency which was one-third higher than that of complete denture wearers. The use of teeth as overdenture abutments is beneficial to patients. The psychological aspect of patients losing teeth should not be underestimated and this has been well documented. In the past extraction of entire dentition with complete denture replacement used to be promoted as an inexpensive and permanent solution for oral health care which lead to problem of advance ridge resorption (RRP). Clinical experience and documented research proved the merits of retaining natural teeth to serve as abutment under compete denture. The objective is to distribute stress concentration between retained teeth abutments and denture supporting tissues the greater retention and stability of overdenture in comparison with complete denture greatly improve the masticatory efficacy. The technique was successfully incorporated into management of patient with partial or terminal dentitions, especially when complete denture seemed a likely therapeutic option.

Overdenture therapy envisages essentially a preventive prosthodontic concept since it attempts to conserve the few remaining natural teeth. There are two physiologic tenets related to this therapy: the first concerns the continued preservation of alveolar bone around the retained teeth. While the second relates to the continuing presence of periodontal sensory mechanisms that guide and monitor gnathodynamic functions.

4. Conclusion

Overdenture supported by natural teeth is one of the best treatments available for edentulous condition. Despite recent development in dental implantology, the conservative approach of root preservation is still valid. In conclusion to obtain successful overdenture rehabilitation the dentists must be careful during case selection and abutment preparation and a proper periodic follow-up.

References