

Simple Overdenture Technique, Lasting Results-A Case Report

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ABSTRACT

“It is more important to preserve what already exists than to replace what is missing” as stated by M.M.Devan. Progressive alveolar resorption after tooth removal can be prevented by retaining teeth or tooth root beneath an overdenture. The tensile forces on the periodontal ligament fibers may lead to deposition of bone which will provide better stability, support and retention to the denture.

This clinical report describes use of selectively retained roots and abutments to minimize alveolar ridge resorption below the complete dentures.

Key Words: Preservation of bone, bone resorption, proprioception, overdenture.

INTRODUCTION

An Overdenture is a removable complete or partial denture that has one or more tooth roots to provide support. Preventive Prosthodontics emphasizes the importance of any procedure that can delay or eliminate the future Prosthodontic problems. The overdenture is a logical method for the Dentist to use in preventive Prosthodontics. It is further emphasized that patient treated with overdentures demonstrate less vertical alveolar bone resorption in comparison to the conventional dentures and in turn preserves the residual alveolar bone^{1,6}

The success of overdentures is dependent on maintaining oral hygiene at an adequate level.²

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 implants.

Heartwell

A tooth supported complete denture is a dental prosthesis that replaces lost or

missing natural dentition and associated structures of the maxilla and/or mandible and receives partial support and stability from one or more modified natural teeth.

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.

Advantages of overdentures

Preservation of alveolar ridge

Preservation of proprioceptive response

Ease of maintenance

Stability

Retention

Less trauma to the supporting tissues

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COPING OVERDENTURES:

Coping Types -A coping fitted to a prepared abutment is called a primary coping. The sleeve or coping that fits over this primary coping is referred to as a secondary coping.

There are four basic types of primary copings:

- 1. Long Copings (6-8 millimeters for vital teeth)**
- 2. Medium Copings (4-6 millimeters for vital and non-vital teeth)**
- 3. Medium short copings (2-4 mm for non-vital teeth)**
- 4. Short Copings (1-2 millimeters for non-vital teeth)**

Overdenture with Attachments:

The attachments essentially increase the crown-root ratio and then torque. Here, low caries index, proper home care, periodontal health and inter ridge distance are absolutely necessary. Studies have also showed that forces on Dolder bar produce stress directed more apically than from the Zest anchor.⁴

ATTACHMENTS CAN BE CLASSIFIED ACCORDING TO SHAPE, DESIGN, AND PRIMARY AREA OF USE AS FOLLOWS: ³

Coronal

1. Intracoronal attachments
2. Extracoronal attachments

Radicular

1. Telescope stud attachments (pressure buttons)
2. Bar attachments
 - a. Joints
 - b. Units

Accessory

1. Auxiliary attachments
 - a. Screw units
 - b. Pawl connectors

- c. Bolts
- d. Stabilizers/balancers
- e. Interlocks
- f. Pins/screws
- g. Rests

EVALUATION;

The examination includes: Patient history, Study casts, clinical examination, and Radiographs. It is very difficult to make a correct diagnosis to determine if the overdenture is indicated for the patient or the problems can be solved by alternative techniques. This is ascertained by taking a proper history of the patient's medical background and past dental history. The past dental history indicates the patients experience with previous removable appliances and his attitude towards the treatment. Study casts accurately mounted on an articulator show the occlusal relationship of the teeth and arches, the vertical spaces between arches and location of bony undercuts.

Radiographic examination is done to evaluate presence of pathological conditions, presence of retained roots, bone loss, root curvatures, root canals are noted.

Diagnosis includes: Clinical evaluation and selection of abutments, abutment location, bone support, proximal space between abutments, number of teeth available, masticatory load and opposing dentition and the type/design of prosthesis required.

CLINICAL REPORT

A 67-year-old male patient reported with the chief complaint of difficulty in chewing food.

Patient gave history of loss of teeth since five years due to gum diseases.

On extra-oral examination patient had a convex profile. (Figure 1)



Fig 1: Pre-operative extra oral view

Intra-oral examination revealed remaining mandibular canines and premolars. The maxillary residual ridge was favourable and mandibular ridge was moderately resorbed. (Figure 2)



Fig 2: Intra Oral View of maxillary arch

After clinical and radiographic evaluation the suggested treatment was to retain the mandibular canines and premolars after which an overdenture was planned. This would increase the retention, stability and support of the prosthesis.

Procedure:

Informed consent was obtained from the patient before starting the treatment since the crown root ratio was not favourable



Fig 3: Cemented copings

and was encroaching the interocclusal space in denture fabrication, the canines and premolars were endodontically treated. 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 (Figure 3) and wax pattern was made with inlay casting wax. (Figure 4)



Fig 3: Impressions



Fig 4: Wax pattern of copings

Once the metal copings were fabricated, they were polished and cemented using Glass ionomer luting agent. (Figure 5)



Fig 5: Denture Placement

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. Border extensions were checked and refined. Mandibular impression was then made using medium body elastomeric impression material for easy retrieval from the bony undercut below the mandibular canines (Figure 6). Maxillary impression was made using zinc oxide eugenol paste.



Fig 6: Secondary Impression

Occlusal rims were made and jaw relations recorded. Care was taken to achieve proper vertical dimension, as increased vertical dimension could lead to alveolar resorption. Processing of the dentures was done followed by anterior and posterior try in.

Dentures were placed in the patient mouth followed by laboratory remount and occlusal reshaping. (Figure 7)

DISCUSSION

Progressive alveolar atrophy after tooth extraction can be prevented by retaining teeth or tooth root beneath an overdenture. However patient cooperation is mandatory for maintaining adequate oral hygiene to avoid caries and periodontal disease of the retained teeth.

The considerable reduction in crown root ratio and the dome shaped configuration of tooth abutment, along with careful adjustment of contiguous denture base facilitates an axial resolution of occlusal forces.

The tensile stimulation of periodontal fibers results in the deposition of bone followed by concomitant decrease in abutment mobility⁹. The support provided by the abutment teeth is in addition to that supplied by the residual ridges. The stability is enhanced by the vertical component of the retained tooth/root in the alveolar bone.

An additional feature is proprioception through the periodontal fibers, overdentures gives a patient a sense of discrimination to touch and pressure, which is less possible by using conventional complete dentures.

In case of mandibular abutments, the tensile forces on the periodontal ligament fibers may lead to deposition of bone which facilitated for better stability, support and retention of the lower denture. The only disadvantage⁵ was that the prominent bone on the labial cortex created an undercut. Many times some compromise had to be made by blocking out the undercut resulting in denture flange that is spaced away from tissues.

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. Greater emphasis must be given on proper case selection, diagnosis, and treatment planning.

By preserving the submerged root or teeth for overdenture, alveolar bone resorption can be reduced considerably.

Also there will be drastic improvement in retention, stability and support of the prosthesis.

Overdentures thus become an alternative treatment for patients advised for total extraction.

Proper oral hygiene instruction must be given to the patient and reinforcement of the same done. Recall examinations with

radiographs at regular intervals of six months or less will maintain the prosthetic, restorative and periodontal status of the patient at acceptable levels, which in turn leads to the success of the overdentures.

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