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"Tooth-Supported Overdenture-A Viable & Economical Alternatives: Case Report"

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Abstract
The use of overdenture allows an individual to retain the roots of natural teeth, which by any mean are the best option to preserve the residual alveolar ridge. The concept of conventional tooth-retained overdentures is a simple and cost-effective treatment than the implant overdentures. When few firm teeth are present in an otherwise compromised dentition, they can be retained and used as abutments for overdenture fabrication. This helps improve the retention and stability of the final prosthesis significantly. In this article, case reports with two different types of Overdentures are discussed: overdenture with telescopic coping, customized metal coping with post.

Keywords: *Overdenture; tooth-supported; post-core; complete edentulous.*

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I. Introduction

Overdenture is an important part of the preventive treatment modality in Prosthodontics. According to GPT 9, Overdenture is "any removable dental prosthesis that covers and rests on one or moreremaining natural teeth, the roots of natural teeth, and/or dental implants; a dental prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants".[1]The importance of retaining natural teeth goes far beyond aesthetics and mastication when it comes to predicting the future of complete edentulism. The concept of overdenture as a viable treatment approach started in the 1960s and continues to be practiced globally on the same principles.[2,3]Overdenture is indicated in patients with few remaining retainable teeth in an arch. It is also preferred in patients with mal-related ridge cases; patients needing single dentures; patients with unfavourable tongue positions, muscle attachments, and high palatal vault, which render the stability and retention of the prosthesis difficult.[4] India being a developing country, the socio-economic status is an important determinant of health and nutritional status as well as of mortality and morbidity. Hence cost is the major dominating factor for the survival of the population.[5]Conventional tooth-supported overdentures are a modest and cost-effective treatment compared to implant overdentures. The presence of periodontium in tooth-supported overdenture plays an important role as shock absorber, allowing physiologic tooth mobility, the elastic modulus of teeth closer to the bone, and functional stimulus for bone preservation.[4]The presence of a healthy periodontal ligament maintains alveolar ridge morphology, whereas a diseased periodontal ligament, or its absence, is associated with a variable but inevitable time-dependent reduction in residual ridge dimensions.[6] To avoid this, two or more, coronally modified or restored retained teeth abutments are frequently endodontically prepared and are used as abutments for an overdenture. The purpose is to disseminate stress concentration between retained abutments and denture-supporting soft tissues. Retained root abutments can give better retention, support, and stability to an overdenture and provide proprioception as well which would otherwise be lost with conventional denture treatment.[7,8]

II. Case Report

Case 1

A 69years old male patient reported to the Department of Prosthodontics and Crown and Bridge, GNIDSR, with the chief complaint of difficulty and pain in the lower anterior region while eating for the past 2 years (Figure 1). He had a completely edentulous maxillary arch (Figure 2). The mandibular arch was partially edentulous with Kennedy type I modification 1. 33, 34, 44 and 45 were present (Figure 3). The patient gave a history of losing his teeth throughout the course of10 years due to multiple caries and periodontal problems. He

had worn three treatment removable partial dentures during that period. No mobility and periapical pathology were noticed in the clinical and radiographical examination. He wanted a prosthesis with good retention as compared to his previous dentures.

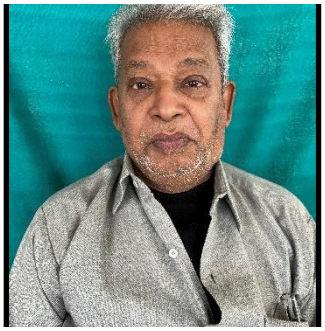

Figure 1

Figure 2

Figure3

TREATMENT PLAN

After an intentional root canal therapy of 33, 34, 44 and 45, they were prepared with tapered round end diamond point with a chamfer finish line made sub gingivally (Figure 4).

Figure4

Impression was made with the addition silicone impression material of regular body consistency (Figure 5).

Figure 5

Dome-shaped copings were fabricated, checked for fit and cemented onto the teeth (Figure 6).

Figure 6

The primary impression for the maxillary arch was made with the Impression compound and with alginate for the mandibular arch. The impressions were poured and special trays were fabricated with self-cure acrylic resin. Border moulding was done for both arches with low fusing compound. The final impression for the maxillary cast was made with zinc oxide eugenol (ZOE) impression paste (Figure 7).

Figure 7

The mandibular final impression was made with regular body elastomer and a master cast was poured for both. Pattern for telescoping coping was fabricated on the mandibular cast and fabrication was done. Occlusal rims were fabricated (Figure 8).

Figure 8

Maxillomandibular relations were recorded and transferred onto the semi-adjustable articulator with the help of a facebow. Teeth setting was done, evaluated in the patient's mouth for phonetics, vertical and centric relation and finally aesthetics. Vertical dimension was verified and centric and eccentric contacts were checked. The patient's approval was taken, and the final denture was cured in heat-cure acrylic resin after incorporating the copings in the mandibular cast (Figures 9 and 10).

Figure 9

Figure 10

The patient was satisfied with the post-operative results (Figure 11).

Figure 11

Case 2

Another 60-year-old male patient reported the chief complaint of difficulty and pain in the lower anterior region while eating for the past 6 months (Figure 12).

Figure 12

On examination, it was observed that the partially edentulous upper arch had only remaining 13 and 25 which were periodontally stable (Figure 13).

Figure 13

Also, mobility was present on the lower anterior teeth. 35 and 45 were periodontally stable (Figure 14).

Figure 14

Treatment Plan

Extraction of the mobile hopeless teeth followed by root canal treatment of the remaining teeth (13, 25, 35, 45) was performed. Preparation for the posts in the endodontically treated teeth was done 4 mm short of the apical length(Figures 15 and 16).

Figure 15

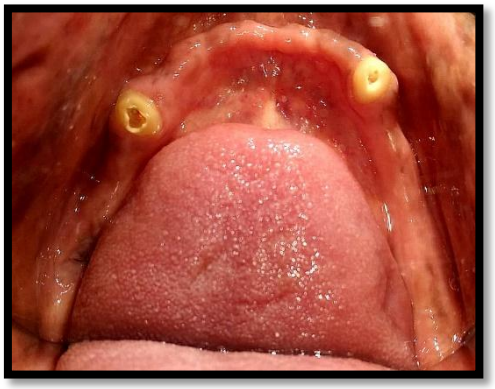

Figure 16

Custom post was prepared with the help of acrylic post with pattern resin.Primary impressions were made with alginate for special tray fabrication. A secondary impression was made with a heavy body and light body elastomer combination and a secondary cast was poured (Figutres 17 and 18).

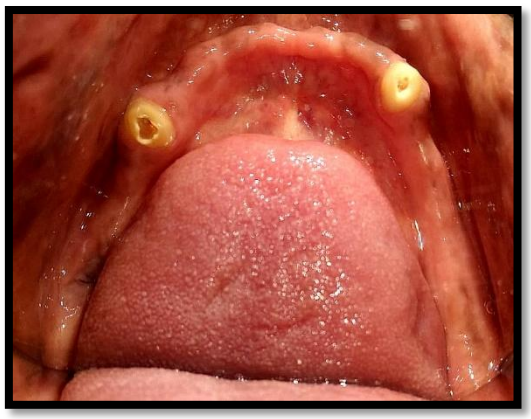

Figure 17

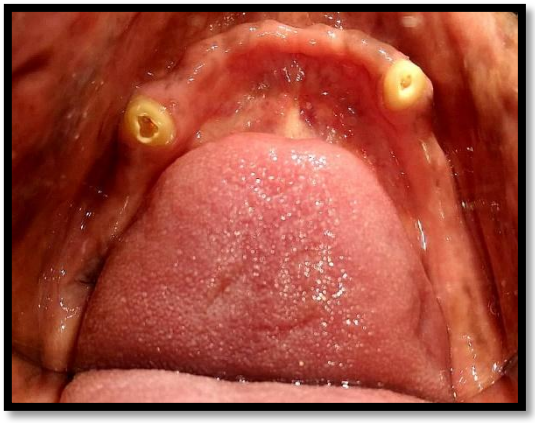

Figure 18

Patterns were fabricated for metal copings and fabricated (Figures 19 and 20).

Figure 19

Figure 20

Trial and cementation were completed (Figures 21 and 22).

Figure 21

Figure 22

Border moulding was done with a low-fusing compound. The final impression was made with regular body elastomer and casts were poured with die stone (Figures 23 and 24).

Figure 23

Figure 24

Wax patterns were fabricated on the master casts for metal housing fabrication. After recording the maxillomandibular relation onto a semi-adjustable articulator with a facebow, teeth setting was done followed by try-in. Vertical dimension was verified and centric and eccentric contactschecked. On getting the patient's consent, the dentures were fabricated using heat-cure acrylic resin. The housings were then incorporated using self-cure acrylic resin (Figures 25,26,27 and 28).

Figure 25

Figure 26

Figure 27

Figure 28

The patient was ecstatic after completion of the treatment (Figures 29 and 30).

Figure 29

Figure 30

III. Discussion

Stabilization of compromised teeth with fixed splinted restorations is usually inadvisable because of the risk factors involved, such as eventual localized abutment failure. Detachable telescopicoverdentures may be preferred as a near equivalent or substitute because they can be detached and repaired without reconstruction of the entire restoration. Inner telescopic copings can be cemented as individual crowns to facilitate the procedure. Telescopic restorations can be retrieved by the patient for cleaning and easy access to the entire marginal periodontal circumference of the abutments. This promotes effective home care and oral hygiene.[9]With advancements in dental implant science, implant-supported prostheses are being increasingly used for treating patients. However, anatomical, medical and financial constraints often prevent patients from opting for the best possible treatment. Implant prostheses do not have as much occlusal awareness as teeth. They cannot fully compensate for the loss of periodontal sensory mechanisms that guide and monitor gnathodynamic functions. Hence, overdentures have been successfully used for the rehabilitation of patients with severe tooth wear and/or few remaining teeth as they provide psychological, functional as well as biological advantages to the patients.[10]

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