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PROSTHODONTIC REHABILITATION USING TELESCOPIC OVERDENTURE: A CASE REPORT

Prosthodontics

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ABSTRACT

Rehabilitating a patient with impaired abutment teeth, many edentulous spaces, and a collapsed occlusal vertical dimension is a challenging task. Over the years, many strategies for treating these patients have been proposed; nonetheless, dental implants have proven to yield the greatest outcomes. However, because of their high cost and surgical limitations, they cannot be used on all patients. For this reason, people continue to choose detachable dentures. The idea of a telescoping denture is explained in this article. It outlines the various telescopic attachment (also known as double crown) kinds and gives a general summary of the benefits and drawbacks of this kind of prosthodontic care. **Conclusion:** A discussion of the telescopic denture's indications and clinical uses is held.

KEYWORDS

Telescopic overdenture, Primary coping, Secondary coping, Double crown, Retention bead

INTRODUCTION:

An increasing number of oral health issues are associated with the ageing population. It used to be accepted that losing teeth was a normal part of growing older, and many people did not think twice about getting new teeth. When replacement was an option, a lot of patients chose to remove all but the last few teeth and use a detachable prosthesis. Teeth extraction causes the remaining alveolar ridges to rapidly resorb, which has an impact on the stability and retention of full dentures, particularly in the mandibular arches. Furthermore, proprioception in the jaws is lost due to a lack of periodontal fibres. By preserving the few remaining natural teeth, treatment times can be shortened and unnecessary treatments can be avoided, all while addressing the psychological needs of the patients.

Overdentures are recommended for prosthetic rehabilitation when a patient has few remaining teeth because they improve denture retention, transfer weight, preserve alveolar ridges, and preserve some proprioceptive characteristics and sensory feedback. A removable partial or full denture that covers and rests on one or more natural teeth, dental implants, or roots is known as an overdenture.When compared to traditional attachments, telescopic attachments or double crown systems are superior options. The denture's secondary coping acts as an anchor by attaching to the primary copings on the tooth, preventing cavities, while the tooth's primary coping shields the tooth structure from damage. Overuse of the taper lowers denture retention. As much as practicable, the abutment walls should remain parallel, or the taper should be maintained between two and five degrees.Two Reducing the crown-root ratio following scaling, root planning, and main coping implantation in periodontally deficient teeth greatly enhances tooth health and decreases mobility.

Case Report:

A 60-year old male patient reported to the Department of Prosthodontics, AME's Dental College and Hospital, Raichur, Karnataka with a chief complaint of inability to chew food. The patient provided history of periodontal disease and subsequent extraction of mobile teeth. Intraoral examination revealed a partially edentulous maxillary arch mandibular arch. The remaining natural teeth in mandibular arch was right canine (43), and in maxillary arch teeth present were 13,14,23,24 and 25. Patient had existing removable partial denture.

The patient was informed regarding the various treatment options available, like complete dentures, implant or tooth-supported overdentures, and implant-supported fixed prostheses. Considering the health of the natural tooth, i.e the 43 and the economic conditions of the patient, and the benefits, it was decided to fabricate a tooth-supported overdenture for the mandibular arch. Intentional root canal treatment was carried out on 43.

For the maxillary arch, the diagnostic impressions were made in reversible hydrocolloid (DPI Algitex), and for the mandibular arch, in impression compound (Pyrax Impression Compound). After examining the mandibular model for undercuts during the preparation, the tooth underwent the appropriate modifications.

Using auto-polymerizing acrylic resin (DPIRR Cold Cure), a custom tray was created after adapting a double spacer made of modelling wax (Hindustan Modelling Wax No.2) to the mandibular cast. Tooth prepration was done irt to 43 followed by post space prepration for the same. A 21 gauge co-cr wire of the estimated post space prepration size was used in order to make a pick up up impression within the canal along with the border moulding using light-body polyvinyl siloxane impression material. The master cast was poured with Type 4 dental stone (Kalabhai). The mandibular master cast was used to prepare the primary coping using Cobalt-Chromium (Co-Cr) alloy. The coping was then tried in the patient's mouth for their fit and then cemented in the patients mouth with glass ionomer cement.

After the primary copings were cemented, a second impression was created using a double-step putty wash procedure. A custom acrylic resin tray was used to create a cast, which was then used to build the secondary copings. In the patient's mouth, the fit of the secondary copings over the primary copings was assessed. The tiny metal projections that made up the secondary copings were known as as retention beads, which facilitated the secondary copings in the denture base's mechanical interlocking. The prosthesis was kept in place with some assistance from the frictional contact between the primary and secondary copings.

After placing separating media over the master cast, the secondary copings had to be positioned on it, covered with wax, and the trial denture base had to be constructed using chemically cured acrylic resins. It was easier to separate the wax when it was placed over the secondary copings.

Copings from the trial denture base during the dewaxing process. Additionally, occlusion rims were made to fit over the trial denture foundation. Using a face bow, the horizontal and vertical maxillomandibular recordings were collected along with the occlusion rims and record bases. Try in was done followed by wax up and processing of dentures.

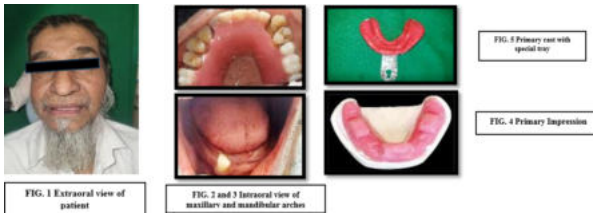
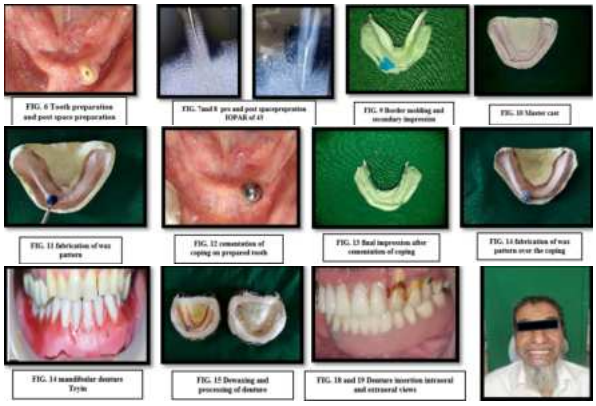


FIG. 1 Extraoral view of patient

FIG. 2 and 3 Intraoral view of maxillary and mandibular arches

FIG. 5 Primary cast with special tray

FIG. 4 Primary Impression



DISCUSSION:

Telescopic crowns have primarily been used in removable partial dentures (RPDs) to attach dentures to the remaining natural teeth. However, their application extends beyond this, as they can also be used effectively to retain complete dentures. In these cases, the dentures receive support both from the abutments and the underlying residual tissues, providing a stable and secure fit.Additionally, telescopic crowns have been employed successfully in RPDs and fixed partial dentures (FPDs) that are supported by endosseous implants. These crowns can be used in combination with the natural teeth, enhancing the overall stability and functionality of the prosthesis. This combination includes overdentures, which are dentures that fit over a small number of remaining natural teeth or implants.

Telescopic crowns can act as effective direct retainers for RPDs. Their retention can be customized to suit different clinical situations by altering their designs. The degree of retention depends on the configuration of the taper angle and the surface contact area between the crowns. By modifying these parameters, dental professionals can control the amount of intersurface friction and, consequently, the retention force.

Furthermore, telescopic crowns can serve as indirect retainers, which help prevent the dislodgement of the distal extension base away from the edentulous ridge. This retention is particularly important in cases where the denture extends to the back of the mouth and needs to stay firmly in place. The resistance to dislodgement is built into rigid telescope retainers, which feature cylindrical or conical primary copings. These copings are designed with no free space between the components, ensuring a snug fit.One of the key advantages of telescopic retainers is their ability to transmit occlusal forces in the direction of the long axes of the abutment teeth, thanks to their pericoronal design. This orientation of force application is the least damaging to the abutment teeth, reducing the risk of long-term damage. In contrast, lateral forces can exert traumatic pressure on the abutments, which can lead to complications and the need for further dental intervention.

Overall, the versatility and functional benefits of telescopic crowns make them a valuable option in both partial and complete denture applications, providing enhanced stability, retention, and longevity for dental prostheses.

Careful evaluation of the interarch space is essential for the successful creation of telescopic dentures. It is important to have enough space to fit the primary and secondary copings, maintain a thick enough denture base to avoid fractures, arrange the teeth to meet aesthetic requirements, and ensure an adequate interocclusal gap. Achieving this often necessitates the devitalization of the abutments.

Patients with natural teeth chew more effectively than those who are edentulous, primarily due to the precise functional jaw movements enabled by the neuromuscular feedback mechanism from the periodontal ligaments. These ligaments contain proprioceptive nerve endings that provide critical information to the neuromuscular system, a function that is lost in the absence of teeth. By retaining the roots of some teeth, it may be possible to use this proprioceptive apparatus with complete dentures, potentially resulting in more accurate jaw movements and improved chewing performance. This approach can extend the lifespan of teeth that might otherwise have a limited lifespan, enhancing denture function for patients.

Telescopic dentures provide better retention, stability, support, and chewing efficiency compared to conventional complete dentures. They also reduce the rate of residual ridge resorption due to the proprioceptive feedback, better stress distribution, and the conversion of compressive forces into tensile forces by the periodontal ligament, which positively affects bone remodeling. A clinical study by Bo Bergman et al. on conical crown-retained dentures concluded that most patients were highly satisfied with their restorations, both functionally and aesthetically, and experienced improved chewing comfort after treatment with conical crown-retained dentures.

CONCLUSION:

Tooth-supported, removable overdentures with telescopic crowns are a valuable alternative to conventional removable dentures. They offer superior retention, stability, support, and occlusal stability. Additionally, they reduce the forward sliding of the prosthesis and enhance control of mandibular movements due to proprioceptive feedback, which improves chewing efficiency and phonetics. Furthermore, these overdentures decrease the rate of residual ridge resorption by converting compressive forces into tensile forces via the periodontal ligament and distributing stress more effectively.

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