

Telescopic Crown Over Denture -A Case Study

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Abstract: By eliminating or delaying the future needs for prosthodontic treatment, preventive prosthodontics has gained importance in recent times. Making an Overdenture is one such procedure by which the remaining teeth can be retained in the dentition. This, in addition to providing support and stability to the denture, also prevents the psychological trauma to the patients for being completely edentulous. The roots of the abutment teeth maintained in this process not only help in denture stability, but also provide proprioception, decrease alveolar bone resorption, and give better load transmission to the denture. An overdenture consists of a primary coping and a secondary coping. The primary coping is the inner coping cemented to the abutment permanently. The secondary coping which is attached to the prosthesis, anchors to the primary coping to form a telescopic unit. In this manner, the primary coping provides retention and stability to the prosthesis. They transfer forces along the long axes of the abutment teeth, providing support and resistance from the movements that dislodge the denture.

Keywords: Over denture, Double crown, Crown and Sleeve coping, Preventive Prosthodontics, Telescopic denture.

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I. Introduction

According to GTP, telescopic denture is called as an overdenture, which is defined as 'Any removable dental prosthesis that covers and rests on one or more of the remaining natural teeth or on the dental implants'^[1]

It was first described by Starr in 1886. Telescopic crown or coping was initially introduced as a retainer for removable partial denture (RPD) at the beginning of the 20th century.^[1] Various terms have been given to this treatment modality- tooth supported denture, overlay denture, telescoped denture, superimposing denture or hybrid prosthesis. A telescopic denture consists of two main parts; First, the primary coping or crown or the male part and the secondary coping or crown or the female part or sleeve. The primary coping is cemented on the prepared or the abutment tooth and the secondary crown with beads is attached within the removable prosthesis or the denture, and these two, in turn, are connected by means of an interfacial surface tension over the primary coping. The retention and stability of the telescopic denture are directly related to the number and distribution of the abutments along the dental arch and the taper of the wall of primary coping.^[1] It works on the principle of movement between two parallel cylinders and the frictional forces between them.

Telescopic overdenture is a preventive prosthodontic concept as it conserves few remaining natural teeth. There are two physiologic beliefs related to this procedure; the first concerns the continued preservation of alveolar bone around the retained teeth and the second relates to the continuing presence of periodontal sensory mechanisms that guide and monitor the gnathodynamic functions.^[2]

These types of removable dentures attached by means of telescopic anchors are regarded to be a good clinical solution. These kinds of prosthesis in patients with reduced and residual dentition gives an opportunity to reduce the destructive rotational and horizontal occlusal forces by directing them more axially. They also increase the stability of retained teeth with periodontal disorders and resists them from pathologic migration.^[2] When only few teeth are present in the dental arch, the three treatment options available are fixed partial denture, removable partial denture or cast partial denture and implants. In certain cases, due to the reduced dentition and periodontal diseases, fixed partial denture becomes an unsatisfactory treatment option. In other cases, the removable partial denture poses a problem of discomfort, decreased proprioception, bone loss and increased chances of oral infection. On the other hand, implants, although comfortable and long lasting, aesthetic and efficient in function are relatively expensive and so they are not effective in cases with major bone

loss and those requiring surgeries, making them unsuitable for some patients. The advantages of a telescopic crown over denture are that, they provide better stability, retention and good aesthetics along with proprioception and prevent residual ridge resorption. It also gives psychological satisfaction to the patient with retention of their natural teeth and the surrounding alveolar bone, thus preventing the patient from trauma of tooth extraction.

II. Case Report

A female patient, 59, reported with complaint of inability to chew her food due to loss of teeth. On intraoral examination, teeth present in upper arch:13,17 and 27 with sound periodontium and in lower arch :31,32,33,34,35,36,37,41,42,43,44,45,47 with sound periodontium (fig.1) Edentulous area in the maxillary arch had a favorable ridge with good keratinized mucosa. 1st clinical visit: A diagnostic cast was prepared with alginate impression. The treatment plan was discussed with the patient and three options were given -1. Implant supported denture 2. Cast partial denture 3. Telescopic denture. Due to financial problems patient opted for the 3rd option i.e. telescopic denture in the maxillary arch. 2nd clinical visit: Patient's consent was taken and prophylactic endodontic treatment for maxillary teeth 13,17 and 27 were started. 3rd clinical visit: Tooth preparation was done on 13,17 & 27 giving equigingival chamfer finish line of 0.7mm and axial wall height of 4mm in 13 and 6mm in 17 and 27 with a taper of 8 to 10° to receive primary metal coping. After tooth preparation, an impression was made with putty and light body addition silicone impression material. This impression was sent to the lab for fabrication of primary coping. (fig.2)

4th clinical visit: Primary copings were seated intraorally to check for their margin and fitting. Primary copings were cemented in patient's mouth with GIC luting cement (Type I; GC Fuji) (fig.3). Pick up impression: after fixation of primary coping in the patient's mouth, the primary impression was made with medium fusing impression compound. This impression was poured in dental plaster and the primary cast was obtained. The spacer was adapted on the primary cast and special tray /custom tray was made using a tray material which was 2mm short from the sulcus area for doing border molding and wash impression or final impression. 5th clinical visit: Border molding was carried out with green stick low fusing impression compound and it was checked once again for extension, retention and posterior palatal seal (PPS)(fig.4). Before making a final impression, spacer wax was removed and wash impression was made with light body addition silicone material (fig.5) This final impression was poured in dental stone and master cast was obtained on which shellac base plate was adapted and the wax rim was fabricated.

6th clinical visit: Maxillo-mandibular relation (Jaw relation) was recorded; the midline and canine line was marked on wax rim inside the patient's mouth. After that teeth selection and shade matching were done according to patient's facial profile and aesthetic needs. Teeth arrangement was done and temporary denture was tried for esthetics, phonetics, retention and stability. Flasking and dewaxing were carried out for the final denture. During packing of the final denture, secondary coping was placed on its position on the cast and it was done with heat cure acrylic resin material. The beads present on secondary coping would help in mechanical retention within the denture. (fig.6) 7th clinical visit: Finished and polished denture was inserted into the patient's mouth (fig.7 & 8) and Occlusion was checked. Post denture insertion instructions and maintenance of oral hygiene were explained to the patient. The patient was recalled after 3 and 6 months for a regular check-up.

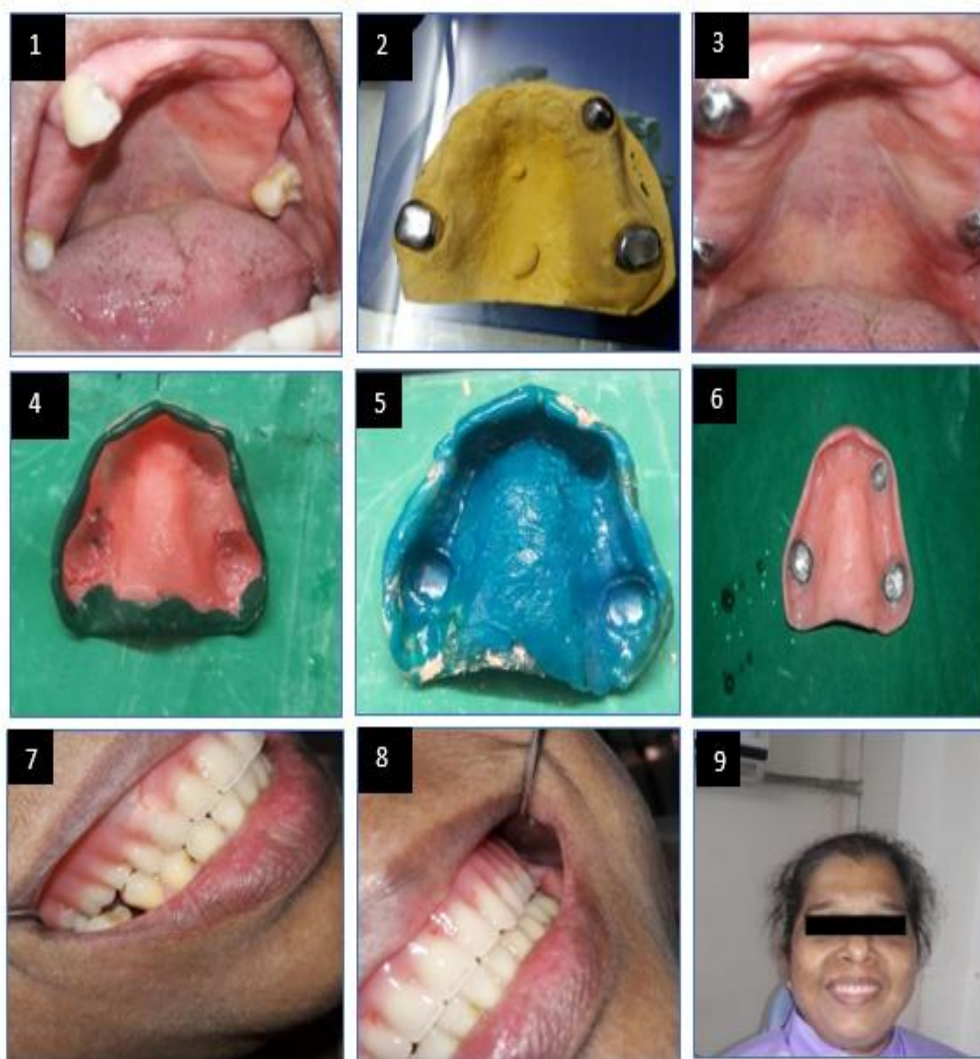


Fig.1: Pre-operative photograph, **Fig.2:** Primary Coping on cast, **Fig.3:** Cemented primary coping on prepared tooth,**Fig.4:** Border Molding,**Fig.5:** Wash impression or Final impression,**Fig.6:** Final denture with secondary crown,**Fig.7,8 ,9:** Final denture in mouth.

III. Discussion

The telescopic crown overdenture was preferred in this patient as it has good retentive and stabilizing property with better and equal distribution of stresses. Whereas other treatment options like extraction of the remaining teeth followed by the making of a conventional complete denture were not chosen in this case as it could lead to rapid residual ridge resorption. Ridge resorption is an irreversible and inevitable process and provides reduced alveolar support. Comparatively, it is observed that the bone is well maintained around long lasting teeth or implants^[3]. Also, proprioception provided by the natural teeth and their periodontal ligaments are lost after extraction. Another treatment option for this patient could be an implant supported prosthesis. But due to the cost involved in this procedure, it was not opted by the patient. Clinical longevity of a telescopic crown overdenture is essentially influenced by the applied restorative concept of connecting the removable denture with the remaining teeth.^[4] Also, retaining the teeth as abutments in overdenture seems to slow down the rate of alveolar bone resorption and provides proprioception. This case with reduced maxillary dentition was rehabilitated using a telescopic crown overdenture with successful results. The advantage of this overdenture is axial loading on the tooth and coverage of the abutments thereby reducing tilting forces which can cause more bone resorption. The axial forces on the tooth stimulate the periodontal tissues and surrounding alveolar bone. The main functional objective is to provide tensile stimulus to as many oblique periodontal fibers as possible with the end result of increased deposition of bundle bone followed by a decrease in the abutment tooth mobility.

The patient was recalled after three and six months respectively to evaluate the gingival and periodontal health status and overall patient satisfaction. There were no significant changes observed in marginal gingiva and the probing depth around the teeth supporting the overdenture. In addition to that, the patient compliance, maintenance of good oral hygiene, ability to speak, comfort and aesthetic appearance, stability of the overdenture during mastication and other jaw movements, all showed marked improvement.

IV. Conclusion

As tooth supported overdentures present with an advantage of improved proprioception along with an increased stability and retention, it proves to be beneficial for the patient. If fabricated well, with good clinical and laboratory expertise, maintained with excellent care, then every telescopic over denture treatment can be a successful one.

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