



## Telescopic Overdenture for Partially Edentulous Patients: A Case Report

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Received: July 14, 2020

Published: August 27, 2020

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### Abstract

M.M. Devan stated, "It is more important to preserve what already exists than to replace what is missing" has always set a gold standard and has never been disapproved. In clinical situations with remaining partial dentition, various treatment options are available to the prosthodontists out of which overdentures have always been considered as a superior treatment modality. Preventive prosthodontics has always been advantageous in maintaining the proprioception and preventing residual ridge resorption, which forms the basis of preventive prosthodontics. This clinical report describes the prosthodontic rehabilitation of a patient with a mandibular telescopic overdenture for added advantages like better retention, stability, support and psychological benefits of the patient.

**Keywords:** Telescopic Overdentures; Preventive Prosthodontics; Primary Copings; Secondary Copings; Overlay Denture

### Introduction

Wide range of treatment modalities which includes conventional removable partial dentures to fixed partial dentures; teeth/implant supported overdentures etc. can be applied to achieve the prosthetic rehabilitation of a partially dentate patient. Conventional removable denture supported by clasps on the remaining teeth and alveolar tissues, have been widely used. However, metallic clasps impose lateral forces on remaining abutments, increase abrasive wear and cause unaesthetic appearance [1]. These metallic retainers are also a cause to permanent deformation of the hard and soft tissues that leads to loss of retention and stability of the prosthesis [2].

An over denture is defined as any removable dental prosthesis that covers and rests on one or more remaining 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. (GPT9) Telescopic overden-

ture refers to the application of interfacial surface tension and friction fit mechanism of retention through the use of parallel double copings over one other. The primary copings are full-coverage parallel-milled and are cemented to the prepared teeth. A superstructure metal framework consisting of secondary copings is fabricated to fit on the primary copings, thus enhancing retention [3-6]. The current case report describes rehabilitation of a partially dentate patient with less than optimum crown-to-root ratio of abutments in the mandibular arch. The ultimate aim was to uplift the functional ease, esthetics, and quality of life of the patient.

### Case Report

A 60-year-old male patient referred to Department of Prosthodontics at D Y Patil University, School of Dentistry for his chewing and speaking inability. He was examined clinically and radiographically after obtaining his medical, dental, and social histories which stated history of tobacco chewing habit 4-5 times a day for last 10 years. Absence of any intra-oral lesions or any kind of fibrosis.

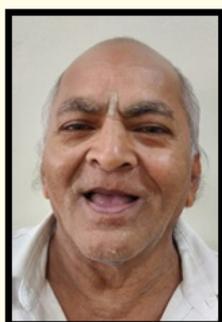


Figure 1: Pre-op Smile.

Extraorally, patient presented with loss of lip and cheek support (Figure 1). Intraorally, it was observed that maxillary jaw was completely edentulous and partially edentulous mandibular jaw with carious 6 teeth present (Figure 2,3). The opg and IOPA's were taken to evaluate the condition of the teeth and surrounding bone. (Figure 4) Patient was informed about the various treatment options like implant/tooth supported removable and implant supported fixed prostheses. When the condition of the remaining teeth, their periodontal tissues health and patient expectations were considered, it was decided to perform a tooth supported telescopic overdenture for mandibular arch and a conventional complete denture for maxillary arch.



Figure 2: Maxillary occlusal view.

At the initial phase of treatment protocol, intentional root canal and oral prophylaxis were performed to the remaining teeth. Diagnostic impressions were made and tentative jaw relation was done. Trial of the Interim teeth arrangement was done (Figure 5). A putty index of the mandibular interim teeth arrangement was made which acts as a guide during abutment preparation (Figure 6).



Figure 3: Mandibular occlusal view.



Figure 5: Interim teeth arrangement.

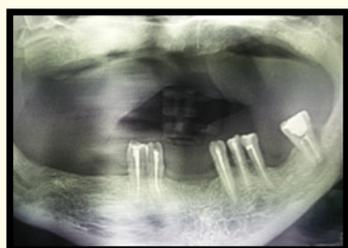


Figure 4: Orthopantomograph.



Figure 6: Putty index of mandibular interim denture.

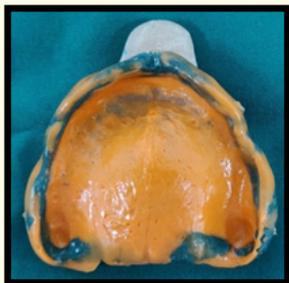


Figure 7: Maxillary wash impression.



Figure 8: Gingival displacement.



Figure 9: Mandibular final impression.



Figure 10: CAD-CAM designed primary copings.

Abutment teeth preparation was planned according to the putty index, keeping sufficient space from the occlusal plane and bone support. Amount of clearance on the abutment teeth was re-verified using the putty index (figure 11). Conventional border moulding and wash impression was done for the maxillary arch (Figure 7). Gingival displacement using '000' braided cord (Ultradent, Ultrapak) dipped in AlCl<sub>3</sub> solution and final impression was made with double mix double step technique, using addition silicone impression material for maxillary arch. (3M,ESPE) (Figure 8,9).



Figure 11: Putty Index to verify space available.

The mandibular definitive cast was obtained and digitally scanned. Primary telescopic copings with shoulder margins were designed and DMLS printed (Figure 10). The seating of the primary copings was verified on the model and a pattern resin jig was made connecting the occlusal surfaces of the copings. Trial of the primary copings were carried out using the pattern resin jig. Once the trial is confirmed, a pickup impression using addition silicone rubber base impression (3M,ESPE) copings was made and the putty index was used to verify the space available for secondary copings (Figure 11). For fabrication of secondary copings, this mandibular cast was digitally scanned. The copings were designed and 3D printed in DMLS technology (Figure 12). Jig trial of the secondary coping was carried out in the similar fashion and picked up on mandibular trial denture base. Trial denture base with occlusal wax rims was fabricated on the maxillary definitive cast and facebow transfer was made (Figure 13).

Verifying adequate clearance of mandibular primary copings to occlusal plane (Figure 14,15) Final jaw relation was made and transferred to a semi-adjustable articulator in order to perform the arrangement of artificial teeth (Cosmo, Dentsply, USA) (Figure 16,17).



**Figure 12:** Secondary copings in trial denture base.



**Figure 16:** Right Occlusion.



**Figure 13:** Facebow transfer.



**Figure 17:** Left Occlusion.



**Figure 14:** Verifying clearance- Right lateral.



**Figure 15:** Verifying clearance- left lateral.

Primary copings were cemented using HY-Bond Glassinomer, Shofu Inc. cement (Figure 18). After the arrangements were evaluated intraorally according to phonetics, aesthetics, vertical dimension, and centric relation, the dentures were processed, finished, and polished.

The patient was given instructions about insertion and removal, eating and speaking as well as maintenance of the denture by use of mouth wash, denture cleaning tablets and twice a day brushing. Denture was delivered and the patient was recalled after 1,3,7 days post delivery (Figure 19-21).

Due to the advancing age and the underlying habits of the patients, post treatment recall was mandatory at intervals of 3,6,9,12 months. The denture was evaluated specially near the secondary coping area (Figure 20) Scaling was performed on the natural teeth abutments. Frequent recalls helped in monitoring overdenture success as the location of the abutments selected were slightly compromised on the right side.



**Figure 18:** Cementation of primary copings.



**Figure 22:** Post Op Smile



**Figure 19:** Final overdenture prosthesis- Frontal view.



**Figure 23:** Follow up at 6th month.



**Figure 20:** Intaglio surface showing secondary copings.



**Figure 21:** Complete Overdenture Prosthesis.

**Discussion**

It is very well documented fact that after the loss of the teeth, the residual alveolar ridge undergoes rapid loss of bone in all dimensions. The residual ridge resorption (RRR) is stated to be rapid, progressive, irreversible and inevitable [7,8]. It is equally well observed that bone is anchored around long-standing natural teeth. Therefore retaining natural teeth/rooth-piece as overdenture abutments seems to slow the rate of alveolar resorption [9,10]. The physiologic reasoning behind this philosophy is to provide the tensile stimulation of the oblique periodontal fibers as possible which leads to the deposition of more bundle bone leading to gradual decrease in abutment mobility.

A telescopic overdenture has advantages of good retentive and stabilizing properties, rigid splinting action, easy oral hygiene maintenance and better distribution of stresses [11-13]. Careful assessment of the inter arch space plays a very vital role for the successful fabrication of any type of overdentures. Sufficient space must be present between the occlusal surface of the prepared abut-

ment and the occlusal plane to accommodate both the telescopic copings, bare minimum thickness of the denture base to avoid fracture and remaining space for the arrangement of the teeth. Intentional RCT's are usually required to suffice this space requirement. The selected telescopic abutments should have no signs of decay and mobility. Telescopic abutments on either side of the jaw are preferable for better stress distribution and for increased retention and stability of the prosthesis. At least 10 mm of interocclusal gap/interarch distance is required in order to fabricate telescopic overdenture [14].

A clinical study conducted by Bergman., *et al.* in 1996 on conical crown-retained dentures concluded that most of the patients were very satisfied with the restorations, both functionally and esthetically, and he found their chewing comfort to be better after the treatment with the conical crown-retained dentures [15-17].

## Conclusion

Patients with conventional removable dentures often face problems of ill-fitting dentures, lack of proprioception and less control of jaw movements over a period of time. Therefore telescopic over dentures may be considered as a good alternative to such conventional dentures because they provide better retention, stability, support, stable occlusion and better control of the mandibular movements because of the proprioceptor feedback in the PDL which increases the chewing efficiency as compared to the conventional complete dentures. Also, the rate of the residual ridge resorption gets decreased because of the transfer of compressive forces into the tensile forces by the periodontal ligament and better stress distribution.

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