CASE REPORT

Tooth-supported Telescopic Denture: A Treatment Modality of Preventive Prosthodontics

Mohit Handa[1], Pratibha Marya[2]

[1]Department of Prosthodontics, Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab, India, [2]Department of Conservative and Endodontics, Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab, India

Email for correspondence: mohit.handa1@gmail.com

ABSTRACT

The prosthetic rehabilitation of partially dentate patients with reduced abutment teeth represents a demanding clinical challenge. Depending on the number of missing teeth and their distribution in the arch, a variety of prosthetic modalities are feasible. In such cases, overdenture therapy has been proven to be advantageous. Bearing in mind the philosophy of preventive prosthodontics, overdenture therapy has a long-term advantage by preserving the proprioception and thereby residual alveolar ridge. The present case report describes the prosthodontics rehabilitation a patient with few remaining mandibular natural teeth by telescopic mandibular overdenture for added advantages such as better retention, stability, support, and psychological benefits of the patient.

Key words: Denture retention, double crown, preventive prosthodontics, telescopic overlay denture

INTRODUCTION

M.M. Devan stated "It is perpetual preservation of what already exists and not the meticulous replacement of what is missing." When few teeth are remaining, the options for replacement are tooth or tissue supported dentures, conventional fixed prosthesis, or implant-supporting dentures. Dentures are often unsatisfactory for patients because of the lack of retention or excessive tissue coverage. Implants are often expensive and may require bone grafting for placement. In other cases, there may not be enough teeth present to support a fixed prosthesis. Furthermore, patients who have lost teeth due to poor oral hygiene may suffer the same problems with implants or bridges. In such cases, a removable prosthesis facilitates the maintenance of oral hygiene. A telescopic denture is an excellent alternative to overcome all of the above-mentioned problems.[1]

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Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontics problems. The overdenture is a logical method for the dentist to use in preventive prosthodontics.[1] Telescopic crowns were initially introduced as retainers for removable partial dentures (RPDs) at the beginning of the 20th century.

Because of its resemblance to the collapsible optical telescope, this system of double crowns, which can be fitted one into the other, became known as the telescopic denture.[2] Telescoping refers to the use of a primary full coverage casting (coping/male telescopic portion) luted to the prepared tooth with a secondary casting (superstructure/secondary crown/ female telescopic portion) which is part of the denture framework and is connected by means of interfacial surface tension over the primary casting.[3,4] Alternate descriptive terms are double crown, crown and sleeve coping, or Konuskrone, which is a German term for a cone-shaped design.[5]

Telescopic crowns can also be used as indirect retainers to prevent dislodgement of the distal

extension base away from the edentulous ridge. Three different types of double crown systems are used to retain RPDs. They are distinguished from each other by their retention mechanisms.[2,5] Cylindrical crowns which exhibit retention through friction fit of parallel milled surfaces, conical crowns, or tapered telescopic crowns, which exhibit friction only when completely seated using a "wedging effect." Double crown with clearance fit exhibits no friction or wedging during insertion or removal. Retention is achieved using additional attachments or functional molded denture borders.

CASE REPORT

A 74-year-old male patient reported to the Department of Prosthodontics, Crown and Bridge and Implantology with the chief complaint of difficulty in chewing and dissatisfaction with his present RPDs. The patient gave a history of loss of teeth for 2 years due to caries and gum problems. On extraoral examination, the patient had a convex profile, and temporomandibular joint was normal. On intraoral examination, the teeth present were 13, 14, and root stumps 16, 17, and 27 in the maxillary arch. The teeth 13 and 14 were mobile and having deep pockets. The remaining teeth present in the mandibular arch were 37, 38, 47, and 48 [Figure 1]. The edentulous span had favorable ridge with firmly attached keratinized mucosa with respect to both arches. After clinical and radiographic examination of the patient, maxillary conventional complete denture and the mandibular telescopic denture were planned with 37, 38, 47, and 48 as abutments.

1. Extraction of 13, 14, 16, 17, and 18 was done, and endodontic treatment of abutment teeth, i.e., 37, 38, 47, and 48 were carried out, emphasizing oral hygiene instructions and maintenance [Figure 2].
2. After assessing endodontic therapy, tooth preparation was done for receiving primary copings to 37, 38, 47, and 48.
3. Impressions were made by the putty reline technique. A finish line was created 0.5 mm above gingiva on wax pattern. The wax pattern was invested, casted, finished, and modified on surveyor for parallelism; the metal copings were cast using Co-Cr.
4. The copings were polished and cemented in the patients' mouth.
5. Alginate impression for the lower arch and conventional impression with impression compound for the upper arch was made, and custom trays were fabricated.
6. Border molding was performed in a conventional manner, and final impressions were made by medium body impression material, and zinc oxide impression paste for mandibular and maxillary arch, respectively, and master cast was poured.
7. The lower master cast was blocked out and duplicated. After duplication, the refractory cast was obtained, and the cast metal framework was waxed up with secondary coverage of the 37, 38, 47, and 48 abutments.
8. The framework was cast in Co-Cr alloy. After trimming and polishing, it was fitted onto the master cast. The framework was tried in the patient's mouth for the final fit [Figure 3].

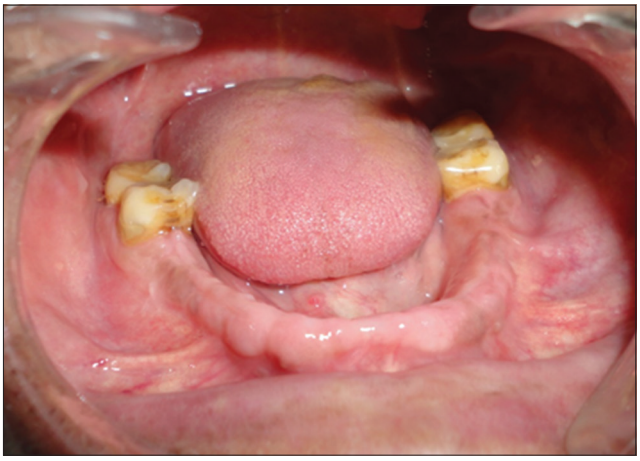

Figure 1: Clinical picture showing 37, 38, 47, and 48 in the mandibular arch

Figure 2: Clinical picture showing maxillary arch with complete healing after extraction of 13, 14, 16, 17 and 18

9. The jaw relation record was made with occlusal rims on the framework and maxillary record base.
10. Wax try in was done in the patients mouth, and patients approval was taken [Figure 4].
11. Acrylization of the framework was done using heat cure acrylic resin, and the maxillary denture was reinforced with metallic shim for increasing the strength
12. Lab remounting of the denture was done, and the lower telescopic denture and the upper complete denture were delivered to the patient [Figure 5]. The patient reported with satisfactory fit and ease of use.

DISCUSSION

Telescopic crown-retained dental prostheses make it possible to restore dentition using a few remaining teeth that are located in unfavorable positions for other prosthetic reconstructions.[6-8] In a recent systematic review, the survival rates of tooth-supported double crown-retained prostheses were 90.0% and 95.1% after 4 and 5.3 years, respectively.[9]

Despite these high survival rates in general, the long-term prognosis of conventional double crown-retained removable dental prostheses depends on the total number of the involved abutment teeth. Several clinical investigations agreed that the failure rates of abutment teeth and their corresponding telescopic prostheses in severely reduced dentitions differed significantly from those in patients with more than three remaining natural abutments. Four or more telescopic abutments can have a positive impact on the survival of the complete restoration.[10]

The crown–root ratio, root configuration, and periodontal conditions are the main factors in the design and selection of abutment teeth for FDP. In the present case, all the factors satisfied the requirements given that the crown–root ratio of the existing teeth was 1:1 of the abutment, the adequate root was embedded in the bone, and the periodontal ligament surface area was more than the surface area of the clinical crown.

There are many advantages of telescopic crowns, like the axial load of the tooth and full covering of the abutment (on the contrary to clasps), which may reduce the tilting forces with their negative influence on the abutment supporting tissues. The axial forces stimulate periodontal tissues and alveolar bone. They also provide indirect splinting influence, easy oral hygiene maintenance and easy ways of repair.[11]

Careful assessment of the inter-arch space is very important for the successful fabrication of

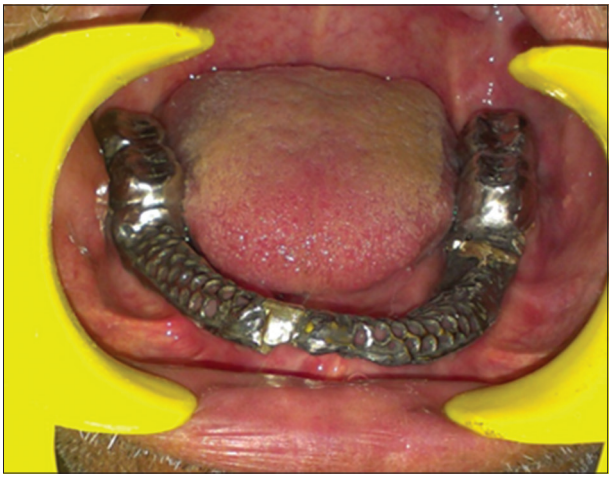

Figure 3: Clinical picture showing Co-Cr metal copings that were polished and cemented in the patients' mouth

Figure 4: Wax try in

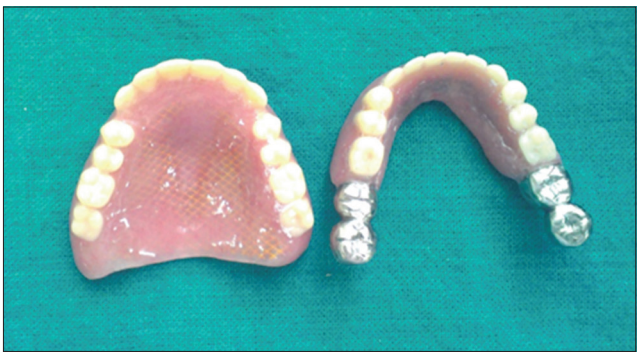

Figure 5: Lower telescopic denture and the upper complete denture were delivered to the patient

the telescopic dentures. Sufficient space must be present to accommodate the primary and secondary copings to have a sufficient denture base thickness to avoid fracture, space for the arrangement of the teeth to fulfill the esthetic requirements, and to have an interocclusal gap. The space consideration usually requires the devitalization of the abutments. The selected abutments should be periodontally sound with adequate bone support and no/minimal mobility. There should be at least one healthy abutment in each quadrant. An even distribution of the abutment in each quadrant of the arch is preferable for better stress distribution and for increased retention and stability of the prosthesis. The interocclusal gap/interarch distance should be 10 mm to have sufficient space for the copings, denture base, teeth placement, and adequate closest speaking space.[12]

As the overdenture status of the prosthesis and its benefits to the patient depend solely on the continued retention of the underlying abutments, it becomes obligatory to periodically monitor their health and institute necessary steps to prolong their useful span. Herein lies the importance of periodical recall and review and patient motivation that makes overdenture therapy a continued service. Although there are increased costs and appointments associated with this technique, they are justified because overdentures are a superior health service compared with the standard complete denture.[13]

CONCLUSION

Tooth-supported removable over-dentures with telescopic crowns provide better retention, stability, support, stable occlusion, and proprioception, which increases chewing efficiency and phonetics. It also decreases the rate of residual ridge resorption.

Although fixed restoration provides favorable conditions for the preservation of oral function, telescopic RPDs may be considered as another option, combining good retentive, and stabilizing properties with a splinting action. The telescopic system may therefore be seen as providing suitable abutments for RPDs even when the remaining teeth are compromised. For other prostheses, excellent oral hygiene maintenance is essential for an optimal prognosis. With telescopic construction, apart from the splinting of the abutment teeth with the telescopic system, the gingival tissues are easily accessible around the entire marginal circumference of the abutment, thus permitting easy home care and oral hygiene.

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