Case Report

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Telescopic Denture: A Case Report

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ABSTRACT

Background: Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems. Over denture therapy constitutes essentially a preventive prosthodontic concept as it endeavours to preserve the few remaining teeth and the supporting structures. Partial edentulousness with reduced number of abutments is a challenging condition and over denture treatment with telescopic copings on retained teeth is a viable treatment option for such cases. Tooth-supported, removable over denture with telescopic crowns may be considered as a good alternative to the conventional removable dentures and complete dentures, because it provides better retention, stability , support, stable occlusion, proprioceptive feedback which increases the chewing efficiency and phonetics, presence of periodontal sensory mechanisms that guide and monitor gnathodynamic functions. Also, the rate of the residual ridge resorption is decreased because of the conversion of compressive forces into the tensile forces by the periodontal ligament and better stress distribution. This paper aims at rehabilitating a partially edentulous patient with telescopic over–denture prosthesis for maxillary arch and cast partial denture for mandibular partial edentulous arch.

Keywords: Telescopic overdenture, Primary coping, Secondary coping, Double crown, Retention bead.

INTRODUCTION

Telescopic denture consists of double crown system in which one coping is fitted over the other, retained by means of interfacial surface tension. Telescopic copings were first designed by Starr in 1886 as removable partial denture retainers. It consists of a primary coping or the male portion of the prosthesis, which is luted to the prepared abutment teeth, and secondary coping or the female part of the prosthesis, which is embedded in the framework of the denture. The forces acting on the denture are transferred along the long axis of abutment teeth that prevent dislodgement of the removable prosthesis.[1]

According to GPT 8, a telescopic denture is also 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, on the roots of the natural teeth, and/or on the dental implants. It is also called as overlay denture, overlay prosthesis, and superimposed prosthesis.

Based on the mechanism of retention, there are three different double crown systems.[2]

A. Cylindrical crowns which are retained by virtue of friction between the parallel surfaces of primary and secondary copings

B. Conical crowns or tapered telescopic crowns which exhibit wedging effect when the copings are seated completely one on top of the other. The retentive force is inversely related to the convergence angle of inner crown.

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C. Hybrid telescope or hybrid double crown which are retained by means of additional attachments

The various indications of telescopic denture prosthesis are:

a) Indirect retention in distal extension removable partial denture
b) Resorbed residual ridges
c) Xerostomia
d) Macroglossia
e) If the patient is too weak to undergo surgery
f) Patients with parts of maxilla or mandible resected
g) Patients with neurological disturbance

CASE REPORT

A 55-year-old male reported to the Department of Prosthodontics, Sudha Rustagi Dental College and Hospital, with a chief complaint of difficulty in eating food due to loose dentures. He gave a dental history of wearing maxillary and mandibular RPDs since 5 years. A preliminary examination revealed that the patient had missing 11, 16, 17, 21, 22, 26, 27, 32, 35, 36 47. The 12, 13 were grade III mobile while 15 were grade II mobile. There was generalized grade I mobility of the remaining teeth. Also there was grade I furcation involvement of 28.Oral hygiene was fair.

Diagnostic impressions were made w.r.t partially edentulous maxillary and mandibular arch using irreversible hydrocolloid impression (tropicalgin) and an inter-occlusal bite registration was taken. The impressions were poured and the diagnostic models were mounted on a mean value articulator. A diagnostic surveying of the models was done using surveyor. A complete radiographic survey was carried out to correlate with the clinical findings. It was decided to extract 12, 13, and 15 due to advanced periodontitis followed by a thorough oral prophylaxis. The periodontal status was reviewed after 6 weeks. After ascertaining the decrease in tooth mobility, prosthetic rehabilitation was carried out. During the definitive intra-oral examination the potential abutments were evaluated clinically to determine their periodontal condition, pockets, mobility, caries, old restorations, vitality, abrasions, and supra-eruption.

The diagnostic findings were as follows:

1. A discrepancy in the occlusal plane was noted due to supra-eruption of 18, 28.
2. The potential abutments had varying paths of insertion.
3. The abutments had a large crown: root ratio.

TREATMENT PLAN

It was decided to prosthetically rehabilitate this patient with a telescopic denture for the maxillary arch and a cast partial denture for the mandibular arch. For maxillary telescopic denture 15, 18, 24, 25, 28 were selected as abutments. Intentional RCTs were performed on these abutments. Tooth preparation was done by preparing a chamfer finish line of 0.7 mm and axial wall heights of 4 mm in 15, 18,24,25,28 with a taper of approximately 8-10°.

In the mandibular arch, missing teeth were 32, 35, 36 & 47. Lingual plate was selected as a major connector. Circlet clasp with occlusal rest were planned on 34 and 37. Ring clasp on 46 with occlusal rest on 45 and 46.

After the tooth preparation in the maxillary arch, gingival retraction was done and a final impression was made with addition silicone (Aquasil) using the putty wash technique. The first master model was prepared from the impression for fabrication of the primary copings.

Wax patterns were fabricated over the abutment teeth and later casted following the standard procedures. Primary copings received were checked in patient's mouth for proper marginal adaptation. The fit was found to be satisfactory. These copings were milled using a milling surveyor unit to attain parallelism between the copings and were subsequently cemented on the abutments using glass ionomer luting cement.

Following the cementation of milled primary copings, an impression was made with addition silicone using the putty wash technique. The impression was poured and second master cast was obtained from the impression over which the wax patterns for secondary copings were fabricated. An additional alginate impression was made following cementation of primary copings over which custom tray was fabricated which was later used for fabrication of final master cast. The secondary

Fig 1: Diagnostic casts (before extraction)

Fig 2: Radiograph.

Fig 3: Pre operative intraoral view.

Fig 4: Tooth preparation done, preparing a chamfer finish line of 0.7mm, axial wall height of 4mm and taper of approximately 8 degrees.

copings consisted of small metal projection beads that aided in mechanical retention of secondary copings in the denture base material.

The secondary copings were checked for friction fit in the patient's mouth. Border moulding was performed using the custom tray and the secondary copings were placed over the primary copings and

Fig 5: Impression for fabrication of the primary coping.

Fig 6: First master model was prepared from the impression for fabrication of primary coping.

Fig 7: Primary copings fabricated on abutment teeth.

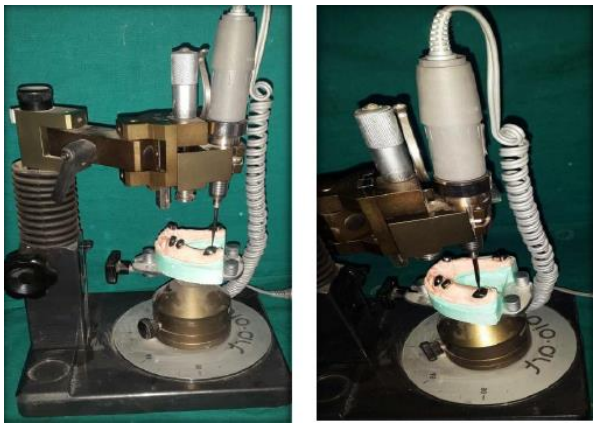

Fig 8: Primary copings were milled on a surveyor to attain parallelism between the copings. Secondary telescopic copings were fabricated over the milled primary copings.

Fig 9: Cementation of milled primary copings, an impression was made with addition silicone using the putty wash technique.

Fig 9: Second master model was prepared from the impression for fabrication of the secondary coping.

were picked up in final impression using medium body addition silicone. The final master cast was obtained from the pickup impression which was used for fabrication of permanent heat cure denture base which contained the secondary copings on the tissue surface. Permanent denture bases were

Fig 10: Secondary copings with retention beads.

Fig 11: Final impression with secondary copings.

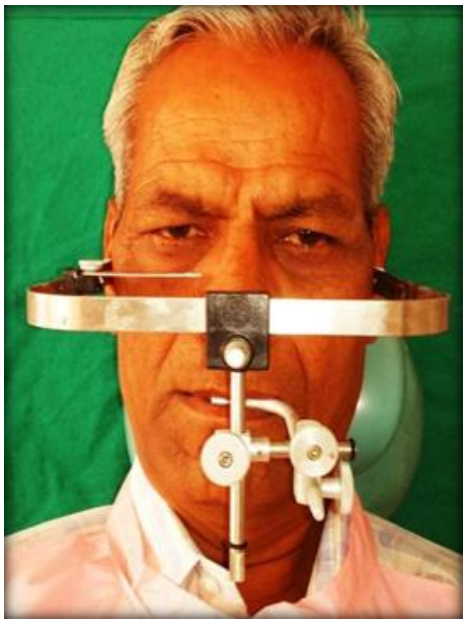

Fig 12: Facebow record.

Fig 13: Tryin

Fig 14: Mandibular refractory cast with wax pattern.

Fig 15: Metal framework.

Fig 16: Metal framework trial.

Fig 17: Complete cast partial denture.

Fig 18: Post operative view. Satisfied patient.

finished, polished and checked for retention and stability in patient's mouth. Occlusal rims were fabricated over the permanent denture bases with attached secondary copings.

Maxillomandibular records were obtained with the record bases and the occlusion rims and these were transferred to a semiadjustable articulator by using a face bow and were mounted. Teeth arrangement was done and during the trial, phonetics, aesthetics, occlusal vertical dimension and centric relation were checked.

After the wax up, the dentures were processed, finished, polished and delivered to the patient. The patient was scheduled for follow-up visits every 3 months.

DISCUSSION

Complete denture fabrication for maladaptive elderly patients becomes difficult. Therefore, they

are the group of patients who will benefit most with telescopic dentures. Dentures which are supported and/or retained with a few remaining teeth or implants can be a predictable treatment that will fulfil most of the demands of the elderly denture patients. Telescopic crowns have also been used successfully in RPDs and FPDs, supported by endosseous implants, in combination with the natural teeth.

The amount of intersurface friction depends on the configuration of the taper angle and the area of the surface contact. Telescopic crowns can also be used as indirect retainers to prevent the dislodgement of the distal extension base away from the edentulous ridge. The resistance to this movement is built-in in rigid telescope retainers with cylindrical or conical primary copings, which are designed with no free space between both the components.

REQUIRMENTS OF THE PROSTHESIS

- Sufficient interarch 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 fulfil the aesthetic requirements and to have an interocclusal gap.

- 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.

- The essential requirements for the long service of the telescopic prosthesis are,

  - to provide adequate height of the vertical walls (at least 4mm),
  - sufficient thickness of the copings (never less than 0.7mm for each casting) and
  - a taper of around 6º's (the retention varies inversely with the taper of the coping).

- The contours and the degree of taper of the outer aspect of the primary coping determine the path of insertion and the amount of retention of the prosthesis.

ADVANTAGES

- Telescopic dentures have more predictable prosthodontic outcomes because of increased support, stability and retention and decrease rate of the residual ridge resorption.

- Patients with natural teeth can masticate more effectively than when they are edentulous (better neuromuscular feedback mechanism from the periodontal ligaments).

- By this means, teeth that normally might have a very short life span can been retained for long periods of time.

- there is a decrease in the rate of the residual ridge resorption

- patients are very satisfied with the restorations, both functionally and aesthetically and it found their chewing comfort to be better

- being pericoronal devices, they transmit the occlusal forces in the direction of the long axis of the abutment teeth.

Concepts of oral rehabilitation for older patients or other patients with reduced dexterity should present simple, adaptable solutions. Attachments that demand a great deal of manual dexterity should be avoided. Precision attachments that are easy for the patients to handle at the time of insertion may become impossible to use within a few years. The telescopic denture or double crown system provides a comprehensive treatment concept for these patients. Insertion, removal, and hygienic care of the denture can be carried out by patients with compromised dexterity, if a patient develops a poor general medical condition, both the dentist and the patient can benefit from short treatment sessions to maintain the quality of the oral restoration.

CONCLUSION

Tooth-supported, removable over dentures with telescopic crowns may be considered as a good alternative to the conventional removable dentures, because they provide better retention, stability, support, stable occlusion and better control of the mandibular movements because of the proprioception feedback which increases the

chewing efficiency and even phonetics, as compared to the conventional complete dentures.

The design of a denture is one of the most important factors influencing long-term success and patient acceptance. Possible local tissue irritation or patient complaints are caused mostly by functional extended borders and parts of the denture base covering the gingival margin of the abutment teeth. Therefore, they should be avoided whenever possible without compromising the need for stability, support, and retention.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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