

Telescopic Overdenture with Customized Double Copings- A Simplified Approach to Preventive Prosthodontics

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Abstract

Preventive Prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems. The conventional modality of treatment for partially edentulous arches with presence of a few teeth, was either to render them completely edentulous by extracting the remaining teeth and providing complete dentures, or restoring them with removable partial dentures. An overdenture with support of few remaining teeth can also be provided as a good alternative. Various attachments and types of overdentures can be fabricated on the retained teeth or roots. The telescopic crowns for the overdenture can be given as a successful attachment. This article presents the simplified technique of telescopic overdenture using customized double copings for the overdenture abutments.

Key Words - Telescopic Overdenture, Preventive Prosthodontics, Double Copings

Introduction:

Preserving a few teeth to reduce the problems at a later date needs a good consideration of avoiding complete edentulous phase of elderly patients. Overdenture treatment is essentially a preventive prosthodontic concept as it attempts to conserve few remaining natural teeth and associated structures¹. There are two physiologic tenets related to this treatment, the first concerns the continued preservation of alveolar bone around the retained teeth², while the second relates to the continuing presence of periodontal sensory mechanism³ that guide and monitor gnathodynamic functions. Overdentures help to partly overcome many of the problems posed by conventional complete dentures like progressive bone loss, poor stability and retention, loss of periodontal proprioception and low masticatory efficiency⁴. Removable dentures attached by means of telescopic anchors are regarded to be a good clinical solution. This kind of prosthesis in patients with reduced residual dentition gives an opportunity to minimize destructive rotational and horizontal occlusal forces by directing them more axially.

Telescopic crowns were initially introduced as retainers for removable partial dentures (RPDs) at the beginning of the 20th century. They were also known as a double crown, crown and sleeve coping (CSC), or as Konuskrone, a German term that described a cone shaped design. These crowns consisted of an inner or primary telescopic coping permanently cemented to an abutment, and a congruent detachable outer or secondary telescopic crown rigidly connected to a detachable prosthesis. Primary copings were designed to protect the abutment from dental caries and thermal irritations and also to provide retention and stabilization to the secondary crown. The secondary crown engaged the primary coping to form a telescopic unit and served as an anchor for the remainder of the dentition.

There are a number of overdenture attachments available which can be used to enhance retention, stability and support. However these options are expensive, time consuming and need complex laboratory procedures, a customized double copings fabricated for overdenture in a simplified technique which is presented here in the case report.

Case report:

A 52 year old female patient reported to the department of Prosthodontics, Crown & Bridge and Oral Implantology with the chief complaint of difficulty in chewing due to missing teeth and lack of esthetics (fig.1). Patient gave history of loss of teeth due to decay. On intraoral examination maxillary teeth present were 11, 12, 13, 16, 21, 22 and 23. Maxillary anterior teeth were periodontally sound but tooth 16 was in compromised condition and needed extraction. In mandibular arch teeth present were 37, 35, 33, 43 and 45 and which were in good healthy

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condition excluding 37 which needed extraction. The edentulous ridge was favorable with firm attached keratinized mucosa. There was loss of vertical dimension of occlusion. TMJ was normal. There was no relevant medical history.



Fig 1 Preoperative

Impressions in irreversible hydrocolloid material were made to obtain diagnostic casts. They were articulated on a semiadjustable articulator taking the facebow, the vertical and centric jaw relation records. The radiographs were taken to evaluate the condition of the teeth to be retained for overdenture.

Treatment plan:

Considering the existing condition of the patients remaining teeth and financial constrains, it was decided to fabricate an acrylic partial denture for the maxillary arch and telescopic overdenture with customized double copings for the mandibular arch. The final plan was discussed with and agreed by the patient. The required preprosthetic procedures were carried out which included, extraction of #16, 37, Oral prophylaxis and endodontic treatment of #35, 33, 43 and 45 to be used for overdenture abutments.

Preparation of abutment teeth for copings:



Fig 2 abutment teeth preparation for primary copings

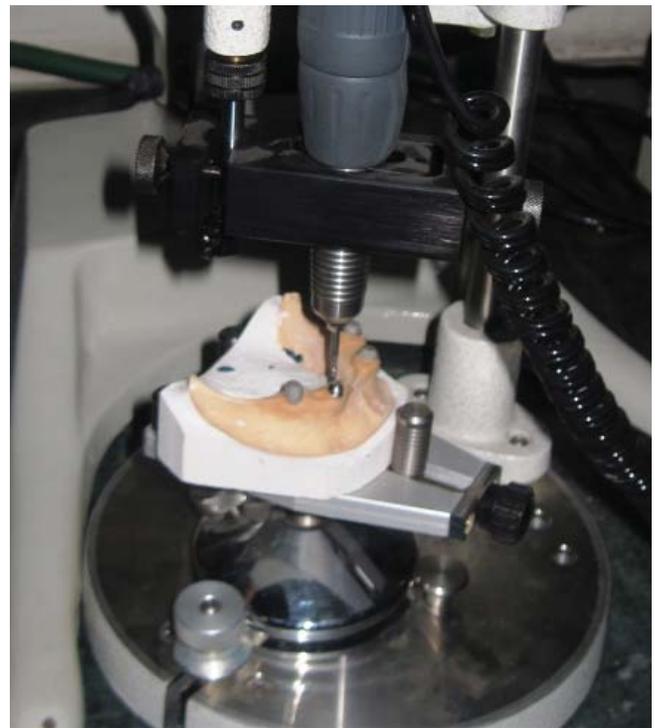


Fig3 milling of primary copings



Fig4 primary copings ready for cementation



Fig5 Cemented primary copings

A new set of diagnostic impressions and casts were obtained and mounted with vertical dimension and centric relation records. Modifications of abutment teeth were planned on diagnostic cast to evaluate the space for double copings. Once this was confirmed the abutment teeth 45, 43, 33 and 35 were prepared to receive the primary copings with a larger modified shoulder (fig.2). It was ensured that all the preparation were parallel to each other with a 6° taper using 6° taper diamond. The finish line was kept equigingival. Retraction was done by gingival retraction cord impregnated in astringent. Special tray was fabricated in self acrylic resin. Impression was made in addition silicon mono phase (aquasil, Dentsply). Cast was poured in die stone.

Fabrication of primary copings:

Wax patterns were prepared on the individual abutment and placed on a surveyor with the carving tool to modify the surfaces and make them parallel to each other. The finish lines on the wax patterns were kept as a modified shoulder to receive secondary copings.

The parallelism and finish lines were critical for frictional resistance and retention of secondary copings.

The wax patterns were sprued, invested and casted with NiCr alloy. After retrieving, copings were finished and placed on milling surveyor to get the final parallelism (fig.3). They were polished and kept ready for cementation (fig.4).

Cementation of primary coping:

The copings were checked for their fit and marginal integrity. They were cemented with glass ionomer cement taking all the required precaution and following protocol (fig.5).

Secondary copings:

Impression of the abutment teeth with cemented primary copings was made in elastomeric monophase impression material in a special tray and cast was poured in die stone.

Wax patterns for secondary copings were fabricated on individual die. The margins of secondary copings were carved to fit the shoulder of the primary copings. They were sprued, invested and casted. These copings were retrieved and finished. The secondary copings were checked intraorally for fit and margins (fig.6).

Denture fabrication:

Secondary copings were spot luted to the primary copings so that they remain stable while making final impression for the fabrication of complete denture.



Fig 6 secondary copings ready for pick up



Fig 7 Secondary copings picked up in denture



Fig 8 post operative view with overdenture

Final impressions were made in special tray using addition silicon monophase elastomeric impression material. Jaw relation records, teeth arrangement and try in were done following conventional method. Both maxillary partial denture and mandibular overdenture were processed. The dentures were

finished and polished. Maxillary partial denture was inserted. Later mandibular overdenture was placed without the secondary copings. It was checked for extensions, retention, stability and occlusion. The secondary copings were cleaned and sandblasted to enhance better adhesion with denture base material. The impression surface of the denture was roughened in the area of where secondary copings were required to be housed. The secondary copings were placed on the respective primary copings on abutments. The self cured acrylic resin was mixed and placed in the trough of the abutments in the mandibular denture and placed over the secondary copings which were in position intraorally.

The resin was allowed to partially set and denture was removed and checked for the position of the secondary copings (fig.7). It was repositioned intraorally and resin allowed to set completely. After removal of denture the excess resin was trimmed off. Denture was finished, polished and inserted. Occlusion was once again checked and adjusted. Post insertion instructions were given to the patient (fig.8).

Discussion:

It is a documented fact that after the loss of teeth, the residual alveolar ridge undergoes rapid loss in all dimensions. The phenomenon of residual ridge resorption (RRR) following removal of teeth has been well observed^{5,6}. While the bone loss following the removal of teeth is stated to be rapid, progressive, irreversible and inevitable, it is equally well observed that bone is maintained around standing teeth and implants⁷. Overdenture treatment constitutes essentially a preventive prosthodontic concept as it endeavors to preserve the few remaining teeth and the supporting structures¹. The number of teeth may be less and not healthy to support a fixed partial denture or unsuitable to support a removable partial denture can often be usefully conserved and suitably modified to act as abutments under overdenture for useful span of time^{8,9}.

The retained teeth for overdenture can be preserved with or without attachments. Simply covering the prepared abutment teeth do protect them. With placing attachments the retention of the overdenture can also be enhanced¹⁰.

In this case a simple approach to the overdenture with double copings custom made by laboratory milling of the primary coping and secondary coping placed in the denture was a simple option for fabricating overdenture.

Summary

Overdenture abutments needs to be preserved for as long a period as possible. This helps in maintaining the bone and health of the tissues. The double coping prepared indigenously and custom made for individual cases would make attachments for overdenture easy and cheaper.

Although the telescopic overdenture is not a panacea, if fabricated well with good clinical and laboratory expertise, maintained with excellent care, then each telescopic overdenture treatment can be a successful one.

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