

CASE REPORT

Telescopic Overdenture

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ABSTRACT

Preventive prosthodontics includes procedures that delay or eliminate future prosthodontic problems. Earlier, patients presenting with poor periodontal health, total extraction followed by a complete denture treatment was considered as permanent solution for oral health care but there was no concept of overdentures. Advantages of overdentures are that they prevent residual ridge resorption, provide better stability, retention, good esthetics and proprioception. The aim of this paper is to present a patient with partially edentulous maxillary arch who was rehabilitated with a telescopic overdenture.

Keywords: Telescopic overlay denture, Coping and sleeve, Preventive prosthodontics.

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INTRODUCTION

In the past, the extraction of entire dentitions with complete denture replacements was promoted as a permanent solution for oral health care. But this approach could lead to residual ridge resorption (RRR) and in turn loss of retention, stability and support. Thus to reduce the resorption of bone under the denture, the concept of overdentures was introduced. The objective is to distribute stress between retained teeth abutments and denture supporting tissues thereby reducing RRR and provide better stability, retention, support and proprioception.¹

The overdenture is defined as a removable partial denture or complete denture that covers and rests on one or more remaining natural teeth, the roots of natural teeth and/or dental implants.²

Miller (1958), one of the first dentists to use overdentures, stated that the maxillae and mandible were designed to house teeth and not to support artificial dentures. He believed that no support for occlusal forces was as adequate as the roots of natural teeth.³ The telescopic overdentures are even more advanced and advantageous over the conventional overdentures. The concept of telescopic crown was derived from the optical microscope which works on the principle of movement between two parallel cylinders. System of telescopic crown consists of two elements: Male or primary crown or coping and the second one, called female or secondary crown or sleeve. The primary crown has to be cemented on the abutment

tooth, whereas the secondary crown is incorporated within the removable denture.

Telescopic overdenture accomplishes many important goals, like it preserves teeth thereby provides psychological satisfaction to the patient associated with the retention of natural teeth and in turn helps in preservation of alveolar bone around the retained teeth and proprioception. The crown and sleeve coping prosthesis uses abutment teeth with long clinical crowns than those used for other types of overdentures and thus exhibits more frictional retention and greater stability. Cross arch splinting is attained when forces are vertically induced, thus benefiting the weak abutments. When horizontal forces become predominant, the secondary crowns release from the primary copings. Cross arch torque is reduced on abutments when telescopic overdenture is used as a treatment option.⁴

CASE REPORT

A 59-year-old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in chewing due to missing teeth (Fig. 1). On intraoral examination, teeth present were 13, 15, 23, 25, 33, 34, 35, 37, 43, 44, 45, 46 and 47. The probing depths were 3 to 4 mm for all the teeth with grade I mobility in relation to 23 and Ellis class III fracture in relation to 46. Radiographic findings (Fig. 2) showed horizontal bone loss for all the teeth. The edentulous span had favorable ridge with firmly attached keratinized mucosa.

Clinical Visit 1

Diagnostic casts were prepared using alginate impressions. Facebow transfer was done and diagnostic casts were



Fig. 1: Preoperative photograph



Fig. 2: Preoperative orthopantomogram

articulated in a semiadjustable articulator by using centric relation record to evaluate inter-arch space (Fig. 3). The treatment options were discussed with the patient, which included the following:

1. Periodontal therapy for all the teeth present.
2. *Maxillary arch:* Telescopic overdenture or implant supported prosthesis.
3. *Mandibular arch:* Fixed partial denture using 33 and 43 as abutments and 31, 32, 41, 42 as pontics or an implant supported prosthesis replacing the missing teeth. Root canal treatment followed by a crown for 46 tooth.

Clinical Visit 2

After considering invasiveness, amount of time and finance the patient elected to have, telescopic overlay denture in maxillary arch, porcelain fused to metal fixed partial denture for mandibular partially edentulous arch and a porcelain fused to metal crown in relation to 46.

After taking consent, the patient underwent oral prophylaxis, flap surgery for teeth in mandibular arch and curettage for teeth in maxillary arch hygiene instructions for maintenance, followed by endodontic treatment for the maxillary teeth which would serve as overdenture abutments.

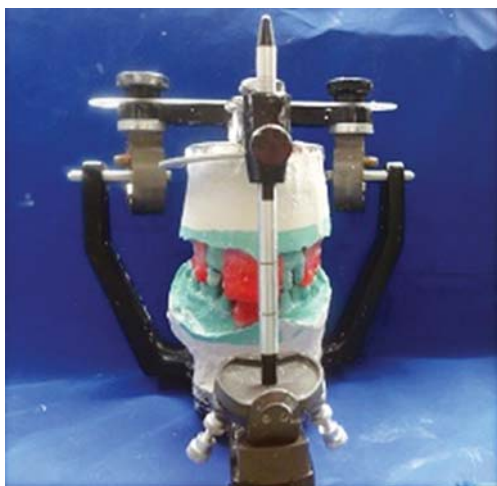


Fig. 3: Diagnostic mounting

Clinical Visit 3

All the maxillary teeth were prepared with a heavy chamfer finish line to receive primary copings (Fig. 4A), mandibular canines was prepared for metal ceramic fixed partial denture from 33 to 43 (Fig. 4B), and as mandibular molar which had grade II furcation involvement for which, tooth preparation with chamfer finish line was done following the furcation flutes (Fig. 4C).



Figs 4A to C: Tooth preparations: (A) Heavy Chamfer finish line, (B) Chamfer finish line following the furcation flutes, (C) tooth prepared for metal ceramic fixed partial denture

Impressions were made using polyvinyl siloxane impression material in a stock tray (Fig. 5) and casts were obtained. On the maxillary cast wax patterns for primary coping were prepared with a chamfer finish line which would serve as a finish margin for the secondary coping (Fig. 6). Cast with wax pattern was mounted on the surveyor to check whether the axial surfaces of the primary copings were parallel to the path of insertion (Fig. 7). Simultaneously, wax patterns for the fixed partial denture from 33 to 43 and crown in relation to 46 were made, invested, casted and finished.

Clinical Visit 4

Primary copings for the maxillary arch were polished and cemented in patient mouth (Fig. 8). Metal trial of fixed partial denture and crown was done. Definitive impression for maxillary arch was made using a custom tray, border moulding was carried out using green stick compound and wash impression made with polyvinyl siloxane impression material (Fig. 9). Casts were made, and waxing for secondary copings was done onto which retention pearls were placed which will enhance retention of these copings in the acrylic denture base resin. These secondary copings

were then invested, casted and finished (Fig. 10) which will later be incorporated into the denture as a chairside pickup into the denture base.

Clinical Visit 5

Maxillomandibular relationships were recorded (Fig. 11) and definitive casts were mounted on the semiadjustable articulator. After shade selection, acrylic resin teeth were arranged and dentures were tried (Fig. 12) and processed using heat cure acrylic denture base resin.

Clinical Visit 6

After the secondary copings were verified for their fit, they were incorporated in the denture using self-cure acrylic resin by chairside pickup (Fig. 13). Finished and polished dentures were inserted (Figs 14 to 16). Bisque trial of the fixed partial denture in relation to 33 to 43 and crown in relation to 46 was carried out. Occlusion was evaluated and adjusted. Glazed fixed partial denture and crown were cemented in the mandibular arch. Postinsertion instructions on oral hygiene and maintenance were explained and the patient was placed on a 6-month recall.

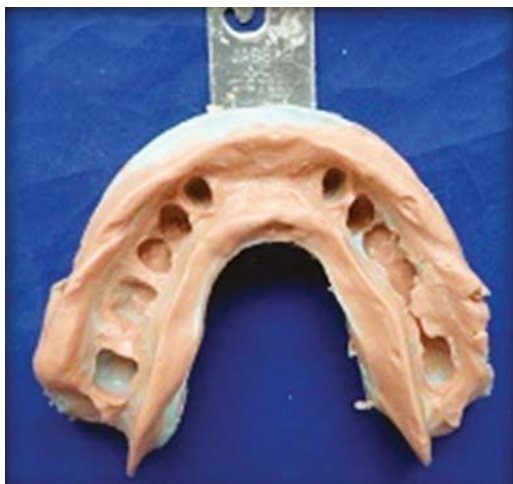


Fig. 5: Impressions



Fig. 6: Wax patterns for primary copings



Fig. 7: Surveying



Fig. 8: Cemented primary copings



Fig. 10: Secondary copings with retention pearls

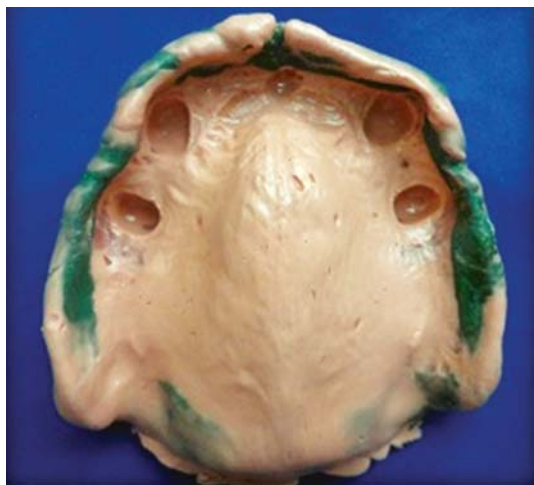


Fig. 9: Border molding

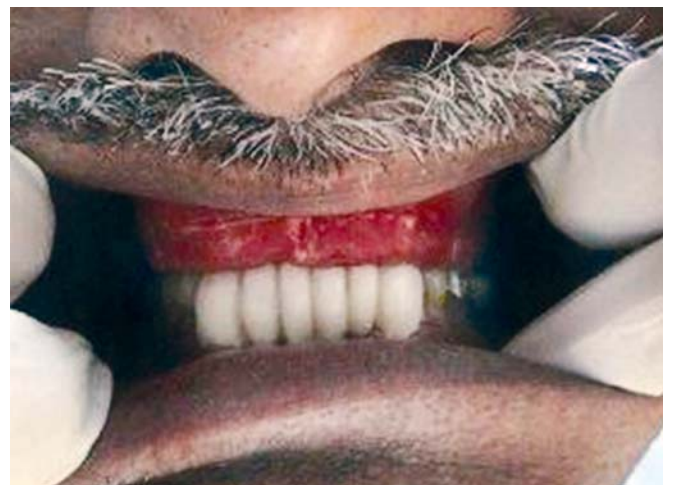


Fig. 11: Jaw relations

DISCUSSION

It is a known fact that, after the loss of the teeth, the RRR is rapid, progressive, irreversible and inevitable, but it is also observed that bone is maintained around long standing teeth and implants.⁵ Several studies have shown that removal of all natural teeth and the wearing of complete dentures for a

long time generally results in alveolar bone loss. Retaining teeth as overdenture abutments seems to slow down the rate of alveolar resorption.

Robert J Crum et al conducted a study to determine the amount of vertical residual alveolar bone loss in the anterior part of the maxillae and mandible in two groups



Fig. 12: Denture try-in



Fig. 15: Denture insertion right lateral view



Fig. 13: Denture with secondary copings



Fig. 16: Denture insertion left lateral view



Fig. 14: Denture insertion frontal view

of patients: One group with complete maxillary dentures and mandibular overdentures, and the other group with complete maxillary and mandibular dentures concluded that patients treated with complete maxillary dentures and mandibular overdentures demonstrate less vertical alveolar

bone reduction than patients with complete maxillary and mandibular dentures.⁶

Preventive prosthodontics includes various procedures that can delay or eliminate future prosthodontic problems.

Overdenture is one of the preventive prosthodontics concept which helps to preserve the few remaining teeth and the supporting structures.^{7,8} The teeth which are periodontally weak and cannot support a fixed partial denture or a removable partial denture can at times be conserved and be used as abutments under overdentures.

Overdentures should be considered an alternative to complete dentures, especially in patients with insufficient alveolar bone support.⁹ The telescopic denture which was supported by the natural teeth became popularity as an alternative to the conventional dentures during the 1970s and the 1980s.¹⁰

This paper reveals a case with reduced dentition which was rehabilitated using a telescopic overdenture with successful results. The advantages of telescopic overdentures are axial loading of the tooth thereby reducing

tilting forces which can cause resorption of the bone. Advantages of telescopic overdenture over other types of overdentures are the additional frictional resistance to dislodging forces which are afforded by long copings gives greater stability thereby reducing destructive forces on the tissues during mastication and the proprioceptive feedback from the periodontal ligament prevents the occlusal overload and it consequently avoids the RRR.

By saving the crowns and roots of abutment teeth, the resulting prosthesis replicates the functions of natural teeth but it becomes mandatory to periodically recall the patient as the benefit from this kind of prosthesis is based only on the continued retention of the overdenture abutments.

Drawbacks of the telescopic overdentures are as follows:

1. Denture hygiene of a high standard is essential.
2. Overdentures cost more than complete dentures.
3. The abutment roots must possess a sufficiently good prognosis.
4. Overdentures are bulkier.
5. When the overdenture is removed at night, the patient appears virtually edentulous.
6. The retention and the stability of the telescopic denture are affected if the number of abutments along the dental arch is not adequate.

SUMMARY

Telescopic overdenture is one of the preventive prosthodontic concepts. If fabricated with expertise and maintained with proper care, then it can serve as an excellent treatment option for a patient with reduced dentition.

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