***Case study***

# Telescopic hybrid prosthesis – A case report


## Abstract

A telescopic denture is a prosthesis which consists of two copings, one is a primary coping which is cemented to the abutments and a secondary coping which is attached to the prosthesis and it fits on the primary coping to increase the retention and stability of the prosthesis. The following case report is on telescopic hybrid prosthesis for maxillary arch.



Keywords: Removable prosthesis, telescopic denture, hybrid prosthesis, Kennedy's class IV, removable prosthesis, double coping


## Introduction

Preventive prosthodontics emphasizes the importance of any procedure that can delay or eliminate future prosthodontics problems. Overdenture is one of the methods for the dentist to use in preventive prosthodontics[1].

In the beginning of 20th century, Telescopic crowns were introduced as retainers for the removable partial dentures and were also known as a Double crown, a crown and sleeve coping or as Konuskrone,[2] by German term that described a cone-shaped design. Telescopic crowns are an effective means for increasing the retention of the Removable partial dentures. Telescopic

crowns function by transferring the forces on the long axis of the abutment teeth and provide guidance , support, and protection from the movements that dislodge the denture.

The double crown systems are of three types which function by their different retention mechanisms.[3] The telescopic crowns which-achieve retention by using friction, whereas conical crowns or tapered telescopic crowns achieve retention by using "wedging effect." The magnitude of the wedging effect is principally, determined by the convergence angle of the inner crown. Smaller the convergence angle, the greater is the retentive force. The double crown with a clearance fit (also named as a hybrid telescope or a hybrid double crown) contains no friction or wedging during its insertion or removal, retention in such prosthesis is achieved by using additional attachments or functional molded denture borders.

Telescopic denture is better treatment modality compared to other fixed implant supported dentures in terms of best access for oral hygiene, better aesthetic result and use of a lower number of implants. On the other hand overdentures are also beneficial for phonetic reasons whether its tooth or implant supported.

Stability and Retention of the telescopic denture are dependent on the number of the abutments in the dental arch and the taper of the primary coping. This tapered configuration also generates compressive inter surface tension within the contacting walls which further helps in retention of prosthesis

Taper within the coping is inversely proportional to the retention between the copings. Smaller the taper, better the frictional retention of the retainer. In patients where the abutments are of shorter clinical height, the walls should be either kept parallel or the taper should not exceed (2-

5º) to improve the retention. According to the requirements in different patients taper of the copings can be adjusted.

In the 1970s and the 1980s the telescopic denture gained more popularity as an alternative to the conventional dentures. In comparison to the conventional dentures overdenture preserve the bone and minimize the downward and forward settling of the denture. In case of overdenture occlusion of the patient is also maintained rather than shifting forward to simulate the appearance of a prognathic mandible as in conventional denture.

According to the telescopic denture philosophy, occlusal forces get transfer to the alveolar bone through the periodontal ligament of the retained teeth. This proprioceptive feedback prevents the occlusal overload and it prevents the residual ridge resorption which is seen in the residual ridge. In comparison to conventional dentures, telescopic denture also provides improved functions, such as an improved biting force, chewing efficiency and even phonetics. Tooth loss results in loss of the proprioception mechanism that has been a part of the sensory programme throughout life[4].

## 2. CLINICAL REPORT

A 49 years old non-smoker, a male patient presented at the outpatient department, with the chief complaint of missing teeth in the upper front region for 4 years. He wanted the replacement of missing teeth (fig 1) so that the function and esthetic can be restored. On intraoral examination, it was found that 11, 12, 21, 22, 23, 24, was missing due to history of trauma and thorough clinical examination was performed including medical and dental history, radiographic

examination was also done. No relevant medical history was found. The patient was explained about different treatment options. On intraoral examination, abutment teeth were periodontically healthy, with no grade of mobility. Inter-arch space was sufficient to accommodate retentive coping, denture base and for teeth arrangement. So after considering other treatment options it was decided to fabricate maxillary removable partial telescopic hybrid prosthesis. After the radiographic examination, chamfer finish line was prepared using tapered round end diamond rotary bur on abutment teeth (13, 14 and 25) for primary coping. (fig 2) The chamfer finish line was prepared subgingival. Double step putty wash technique was followed to make the impression after abutment teeth preparation and the material used was polyvinyl siloxane elastomeric impression material (putty and light body). Impression was poured and primary copings were fabricated on die stone cast. After fabrication, fit of the primary coping was evaluated in patients mouth and cemented on supporting tooth using glass ionomer cement. [Fig-3]. For the fabrication of secondary copings framework a double step putty impression was made after cementation of primary impression. Friction between primary and secondary coping helped in achieving the retention of the prosthesis.

This model would be used for fabrication of the secondary framework superstructure [Fig-4]. A facebow transfer was done on semiadjusable articulator and both upper and lower models were mounted after doing bite registration. In the laboratory, the copings on the second master model were milled with a parallel meter to obtain a milled surface of minimum 4 mm for friction. Refractory model was prepared using secondary model with the primary coping. Then waxup was done on refractory model for secondary framework. (fig 4), which was then cast using a base metal alloy (cobalt-chrome) with the secondary coping overlay of the primary coping. The fit of the secondary copings/framework over the primary copings was evaluated in the patient's mouth

(fig 5). Porcelain layering was done on the secondary coping 13, 14, 25 and wax rim was prepared on the framework and acrylic teeth were set (fig 6). The maxillary telescopic partial denture was fabricated following the normal single denture fabrication protocol (fig 7). The completed prostheses were evaluated for function, aesthetics, and phonetics (fig 8). The patient was scheduled for follow-up visits every 3 months and he reported no complaints during the 3 years of follow-up (fig 9).

## DISCUSSION

There are number of treatment options for the rehabilitation of partially edentulous arches which can be tooth or implant supported fixed or removable partial dentures, cast partial dentures with intra-coronal or extra-coronal retainers and telescopic prosthesis. Telescopic prosthesis is one of the feasible treatment option in partially edentulous patients. There is enough scientific evidence which has been published till now to support the use of telescopic prosthesis.[5-7] The Glossary of Prosthodontic Terminology defines a telescopic crown as an artificial crown constructed to fit over a coping (framework). The coping can be another crown, a bar, or any other suitable rigid support for the dental prosthesis[8].

In the case presented, considering all the factors like long edentulous span, unfavourable abutments for fixed prosthesis, telescopic denture came out to be the best treatment option. Design of the coping, cross-sectional configuration, taper angle and surface area in contact, alters the quality and quantity of intersurface friction which ultimately controls the amount of retention of the prosthesis. Stability and resistance of the prosthesis is because of the rigid retainers with cylindrical or conical primary copings and precision fit of the primary coping with the secondary

restoration. The tapered configuration of the contacting walls generates a compressive intersurface tension, and this intersurface tension should be sufficiently strong enough to sustain the prosthesis in its place. More the taper of the coping walls lesser would be the retention between the copings. In cases where abutments are of shorter clinical height, the walls should be kept parallel or the taper should not be more than (2–5°) to obtain better retention. The taper of the walls of the primary coping is varied, according to the special requirements of each patient.

Telescopic retainers transmit the occlusal forces along the long axis of the supporting teeth and the lateral stresses on supporting teeth get reduced by using the telescopic retainers, which has been well documented.[8] The other advantages include 1. Secondary crown can be converted into a pontic using the acrylic resin in case of any of the abutment failure, 2. Copings can be easily cleaned as prosthesis can be removed easily and there is good accessibility around gingival margins. This home care procedure also helps in protecting the supporting teeth against dental caries and any other irritation.[9-11]

The main drawbacks of this treatment procedure is that clinical and laboratory procedures are highly technique sensitive and requires competent professional and skilled technician. The other drawback is that the retention get compromised after prolong use of the prosthesis. Whereas the success depends on the precision with which the coping and telescopic retainer is made. Although telescopic retainers is not the most commonly used treatment options despite it offers the access for cleaning by the patient and/or dental surgeon and helps to retain the supporting teeth longer.

## CONCLUSION

For an optimal prognosis in case of fixed dental prosthesis good oral hygiene is essential. Whereas telescopic denture can be considered as an option when supporting tooth is in compromised condition, and removable telescopic retainers also provide good retentive and stabilizing properties with a splinting action. In telescopic denture construction, beside splinting of the supporting teeth with the telescopic retainers, the home care and oral hygiene maintenance is easier as the gingival tissues are easily accessible around the entire marginal circumference of the abutment. So proper plaque control and oral hygiene maintenance is necessary to prevent gingivitis and to prolong the treatment and for good treatment prognosis.

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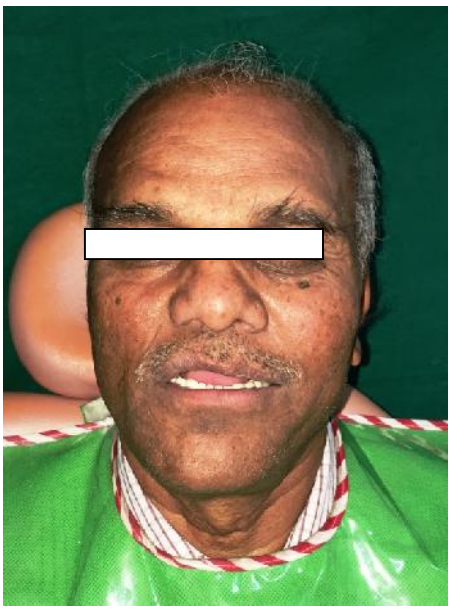

Fig 1. Pre-operative view

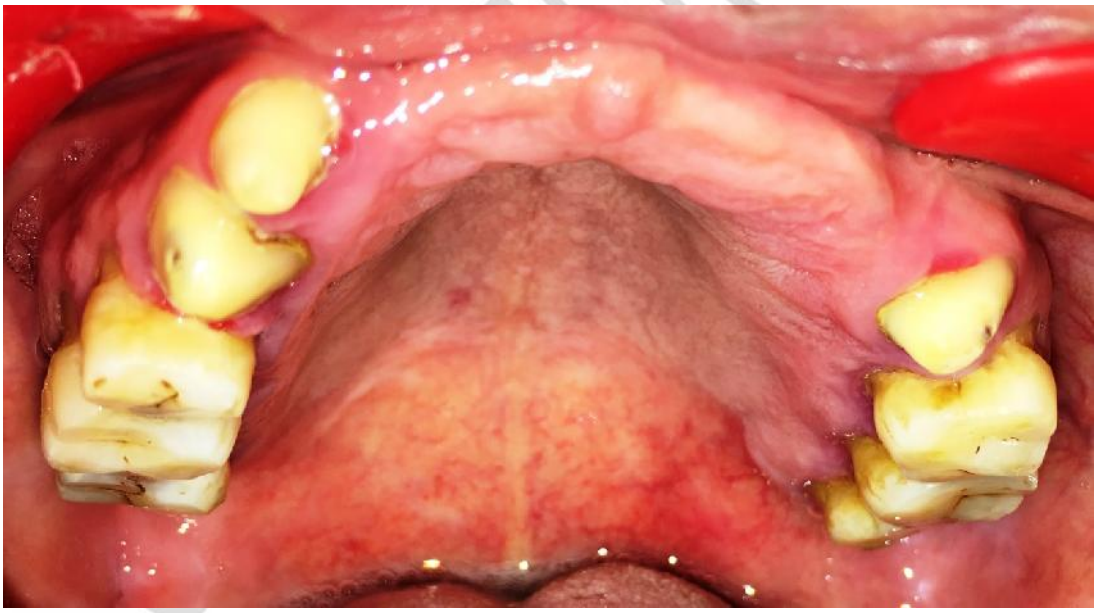

Fig 2. Prepared teeth 13,14,25

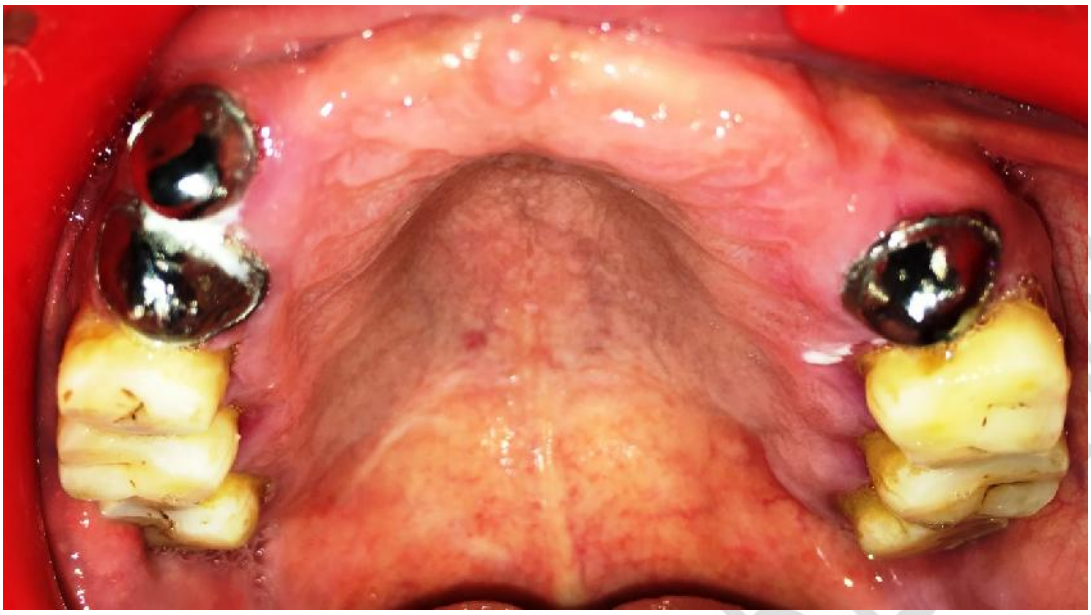

Fig 3. Primary copings

Fig 4. Wax pattern

Fig 5. Metal framework trial

Fig 6. Wax up trial

Fig 7. Final hybrid telescopic prosthesis

202 Fig 8. Final prosthesis intraoral view

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205 Fig 9 postoperative view

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