

Telescopic Partial Dentures-Concealed Technology

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Abstract:

The ideal goal of good dentist is to restore the missing part of oral structure, phonetics, his look and the most important is restored the normal health of the patient, which is hampered due to less or insufficient intake of food. Removable partial denture (RPD) treatment option is considered as a notion, which precludes the inevitability of "floating plastic" in edentulous mouth, that many times fail to fulfill the above essential of the patients. In modern dentistry, though the dental implants or fixed partial denture is the better options, but they have certain limitations. However, overdentures and particularly telescopic denture is the overlooked technology in dentistry that would be a boon for such needy patients. Telescopic denture is especially indicated in the distal edentulous area with minimum two teeth bilaterally present with a good amount of periodontal support. This treatment modality is sort of preventive prosthodontics remedy, which in a conservative manner preserve the remaining teeth and helps in conservation of alveolar bone ultimately. There are two tenets related to this option, one is constant conservation edentulous ridge around the retained tooth and the most important is the endless existence of periodontal sensory action that directs and monitor gnathodynamic task. In this option the primary coping or inner coping are cemented on the prepared tooth, and a similar removable outer or inner telescopic crown placed tightly by using a mechanism of tenso-friction, this is firmly attached to a removable RPD in place without moving or rocking of the prosthesis, which is the common compliant of almost all patients of RPD. Copings are also protecting the abutment from tooth decay and also offers stabilization and maintaining of the outer crown. The outer crown engages the inner coping and gives as an anchor for the remainder of the dentition. This work is the review of telescopic prosthesis which is well supported by the case discussion, and designates the utilization of favorable retained tooth/teeth as abutment that drastically minimized alveolar bone resorption beneath the prosthesis and give the maximum tactile sensation of natural teeth to the patient, which is not possible with other type of RPD.

Key Words: Fixed partial denture, gnathodynamic functions, removable partial denture, telescopic denture

Introduction

According to the M. M. Devan dictum, "It is essential to retain that is present originally in oral cavity than to replace what is lost due to any reason" and this has never been challenged or disapproved by any other dental community worldwide.¹ Conservation of residual alveolar bone after teeth are removed due to caries or periodontal problem or any other reason, should be the priority for all dental professionals, predominately for Prosthodontist and Implantologist, where success of the treatment is highly influence by the amount of residual alveolar bone.² Fortunately we have researched in huge amount in this area of telescopic denture and overdenture, but unfortunately, might be because of complex procedure or long and multiple appointments they are unsealed treatment modalities, which has to be unrevealed for the budding dentists. Delivering implant prosthesis or implant supported prosthesis to every patient is not possible due to many reasons.³ The decrease in the dimension of the ridge is a progressive and irreversible process, and if permitted to go beyond limits, it will threaten the retentive quality of acceptable removable partial denture (RPD).

Therefore, the subject of telescopic denture and its background with well supported by case report has been taken for the publication.

Philosophy of telescopic denture

Telescopic prosthesis transfer forces along the long axis of abutment teeth and gives direction, support, and guard from movements arises during operation in oral cavity.⁴ To hold the removable prosthesis, three different kinds of double crown structure are used. They are distinguishing from each other by their different retention mechanism. However, the basic principal of telescopic dentures contains, inner coping, which is cemented to prepared abutment tooth and an external or secondary telescopic coping, which is merged with the telescopic framework. The inner coping defends the prepared abutment tooth from decay and also provide stabilization to the prosthesis. It is materialized since there is inner and the outer crown coping tenso-friction mechanism. The outer coping employs the inner copings to form a securely attached unit, and it provides retention and stability to the prosthesis, by tenso-friction mechanism.^{4,6}

Here is case report that explains practice of conserving and utilizing favorable retained tooth for conservation of edentulous ridge and by taking support of the same tooth for acceptable amount of retention and stability for telescopic prosthesis that is very well accepted by the patients, without carrying any invasive procedures.

Synonyms of telescopic denture

Hybrid removable denture, sleeves with crown prosthesis, over-lay prosthesis, and the superimposing dentures, double crown, Marburg double crown system, conus crown.³⁻⁶

History

Evan, in 1888, first describes the method for using retained roots to support the denture. During this period, dental community was facing the problem of bone resorption. Bone resorption was the big barrier between the successful prosthesis.^{7,8} After that in 1896, Essig put this idea of telescopic denture in front of the denture society. He gave the telescopic coping design, which was having a tenso-friction mechanism, because of that retention of prosthesis enhanced.^{8,9}

Pesso, employed removable telescopic crown in 1916. Later on, the bar design structure was developed for more refinement in the prosthesis characteristic. Beschnidt *et al.* stated, double crown-retained prostheses have been successfully used in partially edentulous patients. This kind of mechanism provides guidance, support, and defense from a movement, which brings prosthesis away from the ridge, and it transfers bite forces along the long axis of the prepared abutment. In addition, the prosthesis can be removed when an abutment fails to support. By modifying the preparation and veneering abutment tooth, bulk of the double crowns can be controlled. By custom-made all-ceramic crowns as prosthesis teeth and individualizing the denture base, multiplied the aesthetics. Longitudinal follow-up studies of 5-10 years report that conical crown-retained partial dentures have a lower failure rate compared to those retained with clasps or precision attachments. In a case report, clinical and technical aspects of constructing telescopic crown-retained RPD are discussed.^{10,11}

Retention ability of lower prosthesis would be again by an implant-retained or natural tooth-retained bar and stud attachment in the anterior quadrant of the mandible. The similar design philosophy holds accurate for both implant-retained and tooth-retained methods of anchoring the bar and stud attachment.¹² A simple and cost-effective treatment for more complex implant overdenture is the concept of conventional tooth-retained overdentures. When the sound teeth still stay in a compromised dentition, protecting these teeth for overdentures can improve retention and stability. Guttal *et al.*, in 2011, offered a clinical report of a patient treated with a mandibular tooth-borne overdenture with bar and O-ring attachment. A splinted bar hold up the prosthesis and an O-ring retained the denture.¹³

Slot and Meijer,¹⁴ in 2011, emphasized on an implant-retained overdenture, which is a respectable management to a regular dentures treatment, for patients demanding for improvement in fitting of RPD.^{12,14} This criticism mostly experience with lower than an upper removable prosthesis. Implant supported dentures deals enhanced outcome with lower than in maxillary arch. Maxillary resorbed ridges, implants placement with maxillary sinus lift by bone graft might be acknowledged. The remedy for edentulous upper arch is inserting implants, followed by fabricating a bar-clip attachment with implant overdenture is the utmost efficient idea. Post insertion follow-up is obligatory.

Carlsson, in 2014, presented a literature review on implant overdentures later a transitory inspection of bone damage next to extraction of teeth. Moreover, the assumption he drew, in edentulous mandibles, 2-implant overdentures provides a brilliant extended period of success and existence, plus patient gratification and better quality oral functions. To this additionally diminish in expenses in single midline implant overdenture can be an encouraging option. In the maxilla, overdentures sustained on 4-6 implants supported with a bar unproven useful results.^{12,15}

Case report

A 38-year-old male Saudi reported to College of Dentistry, Prince Sattam bin Abdulaziz University, AlKharj, KSA. The patient complained was loss of several teeth in both the arch (Figure 1). Radiological findings show compromised periodontal health and poor prognosis. On intraoral examination, all remaining teeth periodontal status was with poor prognosis.

Treatment plan

The patient was positively interested in the treatment plan with the option of an overdenture with "O" ring attachment with mandibular overdenture and but unhappy with the palatal coverage of maxillary prosthesis. Hence, the alternative treatment options were suggested to the patient with roofless/palate free maxillary telescopic partial denture. For mandible "O" ring supported over denture attachment were cemented, following endodontics remedy of 33, 43 and 44 (Figure 2a and b). For maxillary, the sound teeth present was 14,15, 11, 21, 24 and 25, radiological it was revealed that abutments are having sufficient bone support, and hence the endodontic rehabilitation of the abutment teeth was completed so as to use for abutment for overdenture and rest of the other teeth were extracted. The diagnostic cast was articulated at the anticipated vertical dimension of occlusion. Vertical dimension evaluation was easier because of the presence of premolars. The diagnostic articulation helped in assessing the available inter-arch space, and this was found to be well adequate for the present situation. The tooth used as abutment was gone through elective endodontics. Abutment teeth were made ready for O-ring attachments reception.



Figure 1: Pre-operative intraoral frontal view.

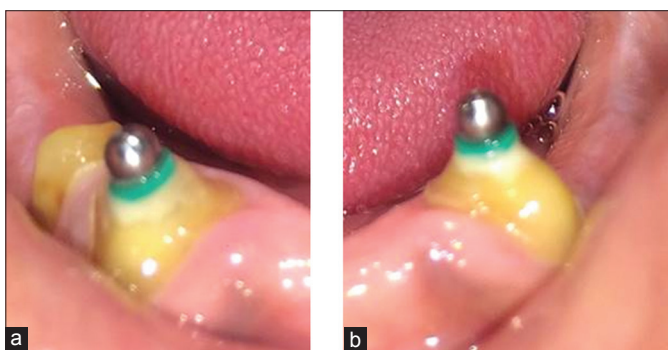


Figure 2: (a and b) Mandibular abutment O-ring cemented with 33 and 43.

Cementation was done with dual cure resin cement for O-ring assembly. Fluoride varnish was applied on dentin of abutment, which is prepared for coping repectation. The final impression was made with polyvinyl siloxane impression material, and cast poured in die stone. The O-ring attachment used for the overdenture analogue consists of silicone O-ring, which has to change every after 2 years.

For the maxillary arch, the abutments were prepared to receive the coping for the telescopic denture. After making a final impression and pouring the cast, the wax pattern of the coping was surveyed (Figure 3) to achieve parallelism in all planned abutment. Coping were cemented after electroplating (Figure 4) and one more impression was made for construction of metal framework for the telescopic denture. The metal framework (Figure 5) was tried, and after necessary modification the maxillomandibular relation was recorded and try-in completed. After taking the patient's consent about phonetic and aesthetics the final processing for both maxillary denture and the maxillary telescopic denture, was finished and the prosthesis was inserted (Figure 6).

Occlusion was assessed and accustomed according to patient's comfort, post-insertion directions like how to place and remove the prosthesis, about the maintenance of telescopic RPD were

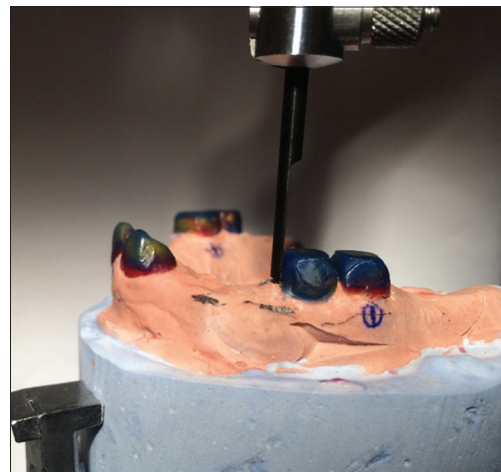


Figure 3: Wax pattern of the coping was surveyed on dental cast surveyor.



Figure 4: Wax pattern of the coping was surveyed on dental cast surveyor.



Figure 5: Metal framework ready for try-in.

given orally and in writing. Passable oral hygiene cares were informed and make sure that the patient will also follow that meticulously. Next to negligible modifications at the time of



Figure 6: Maxillary telescopic denture inserted.

insertion and after insertion visits, the patient instructed to attend recall visit for upcoming 6 months at least.

Discussion

Owal, *et al.*¹⁶ found 25% of RPD fabricated were discarded during 1st year, this occurred because of unacceptable retention and stability of the prosthesis. The scarcity of retention and stability occurred because of residual alveolar ridge undergoes speedy damage in all dimensions with in an initial period of teeth extraction or teeth loss, and this well-known fact in the literature.^{16,17} It is likewise very sound finding that, safeguarding of bone level or dimensions around long standing duration teeth/tooth root and implants is extremely efficient.^{18,19} The over retained tooth roots serves the purpose of preservation of alveolar ridge.¹⁸ Not only the preservation of bone, but also the retention and stability of prosthesis is gained by these retained tooth/root in the alveolar bone.²⁰ The telescopic denture are mainly utilized for transmitting occlusal forces from artificial teeth to abutment teeth, devoid of applying deadly forces on the alveolar ridge. Furthermore, the added quality with telescopic RPD is proprioception because of periodontal fibers of over retained teeth which allow patients a sense of discernment to various senses similar to pressure, which is not acknowledge by edentulous patients using dentures.^{4,11}

The neglected fact about the successful use of telescopic denture depends upon the effective completion and maintenance of endodontic treatment of abutment teeth. While considering the tooth for abutment, proper diagnosis of abutment tooth is very crucial, present periodontal status, radiographic examination, level of left behind bone, assessment of any systemic sickness of patient, oral hygiene status²¹ and prognosis, all these fact are to be considered.^{22,23} The proper diagnosis and skillful endodontic treatment impart a great degree of success to the procedure.

Numerous returns of telescopic RPDs are like, bearing the vertical load, which may decrease slanting forces with their harmful effect on abutments.²⁴ The vertical forces provoke, soft (periodontium) and hard tissues also. They similarly offer

binding together the teeth and prosthesis with stress-free oral care and relaxed ways of repair. In this case, the interconnecting lingual bar to the secondary copings and stud addition confirms the solo path of insertion and removal, retention, and stability to the mandibular denture.

As the RPD and its value for the patient depend exclusively with constant adaptability with and surrounding tissues, it becomes requisite to occasionally look after their fitness and Institute essential stage to delay their useful duration. It's worthy to have frequent recall and assessment. The enthusiastic patient makes over denture remedy a continual amenity.

Even though there are expensive, and appointments related to this practice lengthy, still for the reason that these dentures are a more physically and mentally acceptable facility when evaluated with conventional RPD.

Conclusion

As the upcoming era are determined by Branemark introduction of "Third dentition of titanium roots" i.e., implants, still root suspended overdenture remains superb remedy, which is less expensive, when constructed with experienced dentist and addition to this if handled with proper care of these prosthesis. Hence, telescopic prosthesis remedy can be the most efficacious. Nevertheless, there is a requisite of through clinical and laboratory steps to be tracked permitting as recommended.

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