Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/jpfa



Rehabilitation of a post-trauma case by multiple fixed and telescopic prosthesis: A case report

Kamal Verma [a,*], *Mahesh E. Gowda* [b], *Prasanna Kumar* [c], *I.D. Roy* [d], *Ashish Kalra* [e]

[a] *Division of Prosthodontics, 12 CDU, India*
[b] *Division of Prosthodontics, CMDC (WC), Chandimandir, India*
[c] *Division of Orthodontics, AFMC, Pune, India*
[d] *Division of Oral Surgery, AFMC, Pune, India*
[e] *Division of Prosthodontics, 21 CDU, India*

ARTICLE INFO

Article history:
Available online 25 November 2015

Keywords:
Telescopic prosthesis
Konuskrone
Esthetics
Distraction osteogenesis
Pendulum appliance

ABSTRACT

Telescopic prosthesis is used successfully in removable and fixed dentures in combination with natural teeth and implants. All too often, modalities of telescopic prosthesis therapy are perceived as antiquated and overlooked because quicker, easier solutions are available, but this prosthesis is a viable option till date. They offer treatment that can enhance the survival of natural abutments and provide additional options for complicated and complex cases.

© 2015 Pierre Fauchard Academy (India Section). Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.

1. Introduction

Teeth contribute an important part to one's appearance. A person's appearance and more importantly self-perception of his own appearance have a vast influence on his confidence. All too often, modalities of telescopic prosthesis therapy are perceived as antiquated and overlooked because quicker, easier solutions are available, but this prosthesis may be viable for many dental restorations.[1] A telescopic retainer is a coping that fits under, in a concentric manner, or telescopes within, to support and retain an over crown. Telescopic retainers offer treatment that can enhance the maintenance and survival of natural abutments and provide additional options for the restoration of complicated and complex cases.

Contemporary interdisciplinary approach to dental treatment results in salvaging a greater number of teeth than in the past. Clinical longevity of a removable partial denture is essentially influenced by the applied restorative concept of connecting the removable denture with the remaining teeth. For the long-term success of the restoration, the clinician needs to select the appropriate retainer with regard to number, alignment, and periodontal status of the remaining teeth.[2]

2. Case history

A 21-year-old male patient reported to our department with chief complaints of missing multiple upper and lower teeth and unsightly smile. History revealed that he had a road traffic accident one year back in which he lost his upper and lower anterior teeth owing to a dento alveolar fracture of anterior maxilla & mandible (Seibert's class III ridge) (Fig. 1). Clinical examination revealed missing 11, 12, 16, 17, 21, 22, 26, 31, 32,

* *Corresponding author at*: 12 Corps Dental Unit, Near Military Hospital, Jodhpur, India. Tel.: +91 9571975660; fax: +91 01123338465.
E-mail address: kamalverma_in@yahoo.com (K. Verma).

http://dx.doi.org/10.1016/j.jpfa.2015.10.006

0970-2199/© 2015 Pierre Fauchard Academy (India Section). Published by Elsevier, a division of Reed Elsevier India, Pvt. Ltd. All rights reserved.



Fig. 1 – Intraoral frontal view in occlusion.



Fig. 3 – Pendulum appliance in situ. Orthopantomogram showing pre- and post-distalisation.

33, 36, 41, 42, and 43. Radiological diagnosis shows root canal treated and fractured 23 and mesially tilted 18 and 27.

Diagnostic impressions were made using irreversible hydrocolloid impression material (Plastalgin, Septodont, France) and an inter-occlusal bite registration procedure was carried out. Diagnostic casts were prepared and mounted on semiadjustable articulator (Hanau H2, Teledyne) using a facebow transfer. Diagnostic surveying of the models was done. Comprehensive treatment plan was made in consultation with Orthodontist and Oral & Maxillofacial Surgeon which consisted of providing implant supported prosthesis after distalising & uprighting of 18 and 27. As the available bone volume was inadequate in anterior mandible, distraction osteogenesis was carried out (Fig. 2). Uprighting of 18 and 27 was carried out with Pendulum appliance after extraction of impacted 28. Comparison of pre- and post-distalisation OPGs showed uprighting of molars and obtaining adequate space for making bridge (Fig. 3). The proposed distraction osteogenesis treatment failed, so an alternate treatment plan was chalked out that included fixed prosthesis for maxillary and telescopic retained cast partial prosthesis for mandibular anterior region as the patient was unwilling for further implant related surgical trauma.

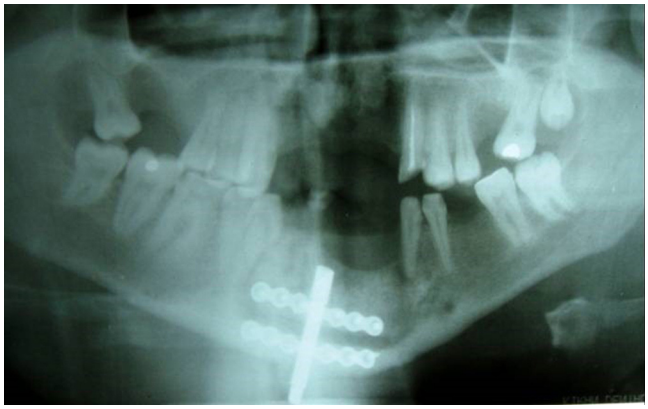


Fig. 2 – Orthopantomogram showing distraction osteogenesis.

After uprighting of maxillary molars, facebow record was made and casts were articulated. Teeth preparation of 15, 18, 25, 27, 35, 37, and 46 was carried out (Fig. 4). Proximal guide planes and distal occlusal rest seats were prepared on 37 and 46. Gingival retraction was done using single cord (Siltrax, 000, USA) technique and final impressions were made using putty-wash (Aquaqsil, Dentsply) double mix technique. Provisional restorations were made with tooth colored resin and occlusion was checked in centric, lateral, and protrusive movements followed by cementation with non-eugenol-based temporary cement (META, Biomed, Korea).

The fixed prosthesis with buccal facing porcelain was fabricated and cemented with luting cement (GIC type I, Fuji, Tokyo). Concurrently, 13, 14, 23, and 24 were prepared for anterior fixed prosthesis and 34, 44, and 45 were prepared for primary copings of telescopic prosthesis. Definitive impressions of maxillary and mandibular arches were made with polyvinyl siloxane (Aquasil, Dentsply, Germany) impression



Fig. 4 – Maxillary posteriors tooth preparations with gingival retraction.



Fig. 5 – Maxillary arch rehabilitation with definitive prosthesis.

material with double-mix two stage putty wash impression technique and casts were poured in die stone (Kalstone, Kalabhai, India). Casts were mounted on an articulator using centric inter-occlusal record. Wax patterns were fabricated and surveying was done. Definitive porcelain fused to metal prosthesis with gingival porcelain was used to rehabilitate maxillary incisors (Fig. 5). Metal copings for 33, 44, and 45 were fabricated and cemented simultaneously (Fig. 6).

A final impression was made for mandibular telescopic prosthesis. Mandibular cast was retrieved and designing, surveying and block out procedures were carried out for duplication of definitive cast. Refractory cast was obtained over which wax pattern was fabricated (Fig. 7). Casting procedures were carried out with nickel chromium metal and framework was retrieved, polished, and sandblasted. Ceramic build-up was done after tryin and the final prosthesis was finished and delivered to the patient. The patient was reviewed after 48 hrs and satisfactory function and esthetics was noted (Fig. 8).



Fig. 6 – Primary copings with respect to 34, 44, and 45.



Fig. 7 – Wax pattern for mandibular telescopic prosthesis.



Fig. 8 – Definitive restorations in situ.

3. Discussion

Telescopic crowns were first described by Starr in 1886 but introduced as retainers for removable partial dentures at the dawn of the 20th century. They are also known as a double crown, crown and sleeve coping, or as Konuskrone and consist 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.[3]

Three different types of double crown systems are used to retain RPDs. They are distinguished from each other by their retention mechanisms[4]:

1. Cylindrical crowns which exhibit retention through friction fit of parallel milled surfaces.
2. Conical crowns or tapered telescopic crowns which exhibit friction only when completely seated using a ''wedging effect''. The magnitude of the wedging effect is mainly determined by the convergence angle of the inner crown; the smaller the convergence angle, the greater the retentive force.

3. Double crown with clearance fit (hybrid telescope or hybrid double crown) exhibits no friction or wedging during insertion or removal. Retention is achieved by using additional attachments or functional molded denture borders.

Telescopic crowns are used successfully in removable and fixed dentures, supported by endosseous implants, in combination with natural teeth, which includes overdentures.[5] A telescopic RPD was chosen for this patient because of its good retentive and stabilizing properties, rigid splinting action, and better distribution of stresses. Teeth are extensively prepared buccally or labially to provide space for a tooth colored venner on the superstructure as proposed by Langer.[6] Ohkawa et al.[7] reported that retention of conical telescopic crowns diminished after repeated insertion or separation cycles. The occlusion is extremely critical because there is no adjustment to compensate for occlusal deficiencies and difficulty of readjustment of retentive forces is another disadvantage.[8]

A removable telescopic denture always earns its support from both teeth and soft tissues, and the inner copings assist in stabilizing the essentially soft tissue-borne denture.[9] Yalisove and Schweitzer[10,11] gave the crown and sleeve coping telescope retainer with a built-in cervical clearance, which leaves surface contact only in the occlusal two thirds. This allows rotation when forces cause the soft tissues in the free end to yield under pressure. There is a difference between a self-supporting (holding) telescopic type tooth-borne restoration with a coping taper of 2 to 3 degrees and a self-releasing tooth and soft tissue-borne type with a taper up to 16 degrees. In a self-releasing type, where retention is not as effective, the support and axial force transmission to the abutments remain.

A telescopic prosthesis was preferred over fixed prosthesis, as it is designed to enable the patient to effectively maintain oral hygiene allowing the esthetic replacement of soft-tissue components. The telescopic approach is now gaining favor in implant prosthodontics, abutments used as inner copings permit modifications of their contours, to provide a common path of insertion for the overlying prosthesis. Even with well-aligned implants, such an approach allows correct emergence profiles to be established for individual abutments, so as to provide a lifelike appearance.[12,13]

4. Conclusion

Telescopic retainers were perceived as having the disadvantages of increased bulk, unesthetic results, and increased cost. Light-cured resin materials, bonding techniques that allow these resin materials to be bonded directly to metal over crown frames, and less-expensive alternative casting alloys have substantially removed the obstacles to this modality of treatment.

Conflicts of interest

The authors have none to declare.

REFERENCES

1. Langer A. Telescope retainers for removable partial dentures. *J Prosthet Dent.* 1981;45:37–43.
2. Brewer AA, Morrow RM. *Overdentures*. Toronto: St. Louis; 1980:175–208.
3. Langer Y, Langer A. Tooth-supported telescopic prostheses in compromised dentitions: a clinical report. *J Prosthet Dent.* 2000;84:129–132.
4. Wenz HJ, Lehmann KM. A telescopic crown concept for the restoration of the partially edentulous arch: the Marburg double crown system. *Int J Prosthodont.* 1998;11:541–550.
5. Laufer BZ, Gross M. Splinting osseointegrated implants and natural teeth in the rehabilitation of partially edentulous patients. Part II: Principles and applications. *J Oral Rehabil.* 1998;25:69–80.
6. Langer A. Telescope retainers and their clinical application. *J Prosthet Dent.* 1980;44:516–522.
7. Ohkawa S, Okane H, Nagasawa T, Tsuru H. Changes in retention of various telescope crown assemblies over long-term use. *J Prosthet Dent.* 1990;64:153–158.
8. Minagi S, Natsuaki N, Nishigawa G, Sato T. New telescopic crown design for removable partial dentures. *J Prosthet Dent.* 1999;81:684–688.
9. Smidt A. *Telescopic restorations in prosthodontics*. Quintessence Publishing; 2000:168–179.
10. Yalisove IL. Crown and sleeve-coping retainers for removable partial prostheses. *J Prosthet Dent.* 1966;16:1069–1085.
11. Schweitzer JM. Discussion of Crown and sleeve-coping retainers for removable prostheses. *J Prosthet Dent.* 1966;16:1086–1089.
12. Preiskel HW. *Telescopic prostheses and precision attachments in prosthodontics: overdentures and telescopic prostheses*. Chicago: Quintessence; 1985:307–325.
13. Preiskel HW, Tsolka P. DIA anatomic abutment system and telescopic prostheses. A clinical report. *Int J Oral Maxillofac Implants.* 1997;12:628–633.

PROMOTE QUALITY PFA FELLOWSHIP