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Telescopic Retainers: An Old or New Solution? A Second Chance to Have Normal Dental Function

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Abstract

This article is an overview of the biomechanics and advantages of telescopic retainers. Telescopic retainers offer more possibilities than any other treatment modality available in modern dentistry. Telescopic implant fixtures make the already versatile technique even more flexible. Telescopes should not be forgotten as a treatment modality, but should be embraced as a great option.

All too often, modalities of therapy are perceived as antiquated and overlooked because quicker, easier solutions may be available. This overview of time-tested telescopic restorative options may prove to be viable for many dental restorations.

A telescopic retainer is a coping that fits under, in a concentric manner, or telescopes within, to support and retain an overcrown. The coping may be an abutment for a fixed dental prosthesis (FDP), removable periodontal prosthesis, crown-sleeve-coping partial denture, or overdenture (Fig 1). *The Glossary of Prosthodontic Terms* 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."[1] The use of telescopic retainers for FDPs or removable prostheses, tooth- or implant-borne, continues to serve as a valuable therapeutic restorative option today. Implants and other current innovations do not make telescopes obsolete as retainers; on the contrary, they can enhance each other and expand the range of viable treatment alternatives. Before the advent of implants, the location and/or number of remaining natural abutments often presented problems in achieving stable, functional, and esthetic restorations. Because of the myriad of options they provide, telescopic retainers afford a modality of treatment that can enhance the maintenance and survival of natural abutments and provide additional options for the restoration of a partially edentulous mouth.

Yalisove and Dietz[2] described the versatility of telescopic retainers in restorative dentistry. They identified the scientific rationale and promoted the use of this modality of treatment. Telescopic retainers provide the following advantages:

1. Efficient home care by removing the overprosthesis (Figs 2–5).
2. Reduction of lateral stress on abutment teeth by allowing for self-releasing or stress conversion (Figs 6–8).

Figure 1 A telescopic retainer is a coping that telescopes within an overcrown that may be an abutment for a fixed partial denture, removable periodontal prosthesis, crown-sleeve-coping, partial denture, or overdenture.

Figure 2 Pretreatment partially edentulous mandible.

Figure 3 Copings for removable telescopic restoration bypassing anterior teeth.

3. Minimal cement failure (Fig 8).
4. Use of weak distal abutments that should not be used in a fixed prosthesis because of their questionable prognosis. In many cases, otherwise hopeless or compromised teeth can be retained (Figs 2–5, 9).

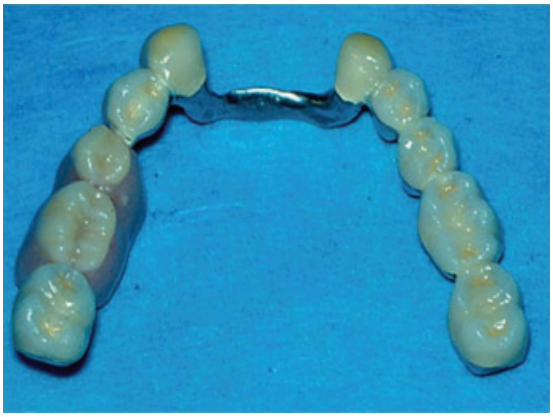

Figure 4 Removable overprosthesis.

Figure 5 Completed restoration of partially edentulous mandible.

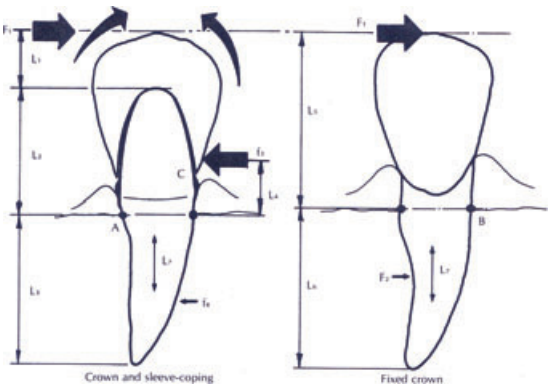

Figure 6 The effective force on the coping under horizontal load is only applied at the gingival margin of the overcrown.

5. Bilateral splinting:
   A. Without involving anterior teeth (Figs 5, 10).
   B. In situations with too few teeth or too long a span for a fixed prosthesis (Figs 2, 9).
6. Restoration of unilaterally edentulous arches (Figs 9, 10).
7. A biomechanical linkage between abutment teeth and edentulous areas (a palatal strap, full palate, lingual bar, or distal extension, etc. may be used) (Figs 9, 10).

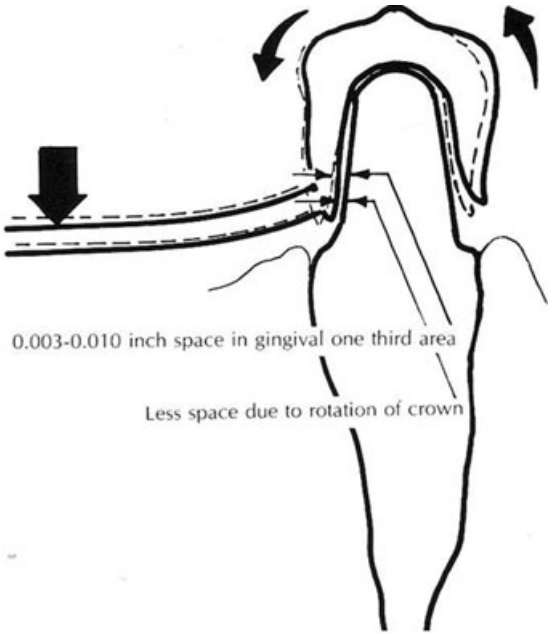

Figure 7 Relief at gingival one third to allow functional rotation.

8. Esthetic replacement of extensive alveolar bone loss (with acrylic) (Fig 10).
9. A bruxism appliance and habit-reducing appliance (Figs 11–13).

Additionally, the relatively recent introduction and success of small, root-like dental implants allows telescopic copings to be cemented to implant abutments, providing total or partial support for a wide array of fixed or removable prostheses. Integration of telescopic concepts and implant abutments has been reported in Switzerland by Besimo and Graber.[3]

Historically, patients have been plagued with problems of maintaining periodontal health around abutments for both fixed and removable restorations. A telescopic prosthesis can be designed to be removed daily, enabling the patient to effectively remove plaque at the gingival crest (Figs 4, 5, 9–12).

Even if a telescopic prosthesis is not removable, telescopic retainers allow inclusion of nonparallel abutments that cannot be made parallel with telescopes. By not carrying the overcrowns into possible undercut areas, access for cleaning can be made possible. In effect, this design creates a restoration on stilts, particularly useful for implant-borne maxillary restorations (Figs 14 and 15).

Reduction of lateral stress on abutments by using telescopic retainers has been well documented. Pezzoli et al[4] evaluated load transmission in distal extension partial dentures and found that telescopic retainers "produced less stress in the edentulous region and transmitted loads more equally to the abutments." Telescopic retainers can rotate over supporting copings (Figs 9, 16, and 17).

In addition, a telescopic prosthesis can be designed to be cemented with light cement, which can satisfy a patient's need for a fixed prosthesis, but also allow for removal by a dentist to curette deep proximal pockets without the hindrance of proximal connectors (solder connections). Nonpermanent cement also enables the restoration to be easily removed should future modification be necessary. A telescopic prosthesis offers the advantage that should a complication arise with an abutment, whether a natural tooth or implant, it can often be resolved. When a telescopic retainer is used in a fixed prosthesis, instead of the cement seal breaking at the metal-tooth interface, the weaker cement used between metal and metal will fail first. This prevents leakage between a natural abutment and its overprosthetic restoration that could contribute to cement failure or caries. An osseous integrated implant becomes integrated in a rigid fashion. Because there is a disparity between the physiologic movement of the natural abutment and an implant abutment, telescoping the natural abutment relieves stress to both abutments and prevents decay secondary to cement washout (Figs 7, 8, 12–15).

Yalisove and Dietz[2] showed that in telescopic crown-sleeve-coping restorations, the effective crown-to-root ratio is reduced

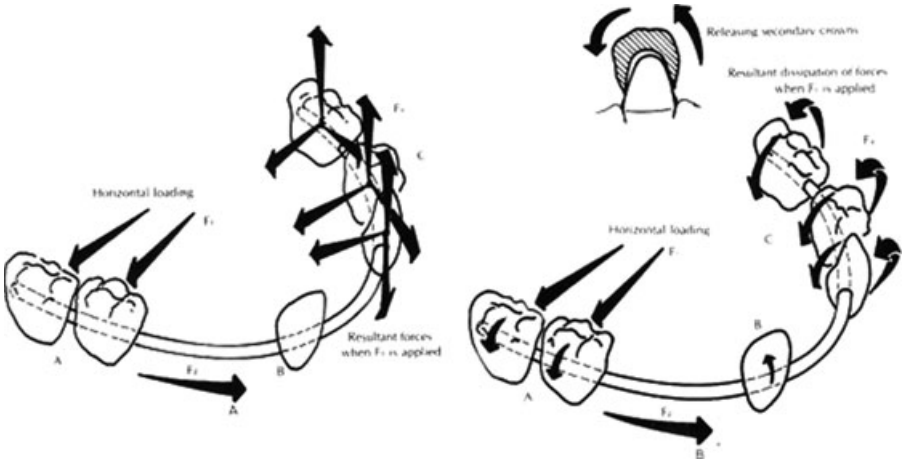

Figure 8 The biomechanical advantage of a telescopic full arch restoration.

Figure 9 Copings for removable mandibular restoration with parabolic occlusals to allow rotation and stress relief when overprosthesis is under function.

Figure 10 Kennedy class II restoration. A unilateral edentulous area is easily restored.

Figure 11 Removable telescopic implant and natural tooth-supported prosthesis that is very cleansible.

at the point that the telescopic overcrown rotates (Fig 6). Inclusion of weak abutments is therefore possible, because the loss of a weak abutment does not risk the loss of or compromise the entire prosthesis. A lost abutment can be dealt with by simply filling the overcrown with acrylic resin to form a pontic. Weaker abutments may be favored by tapering the retainers more, or by making them shorter (Figs 16 and 17).

Figure 12 Removable telescopic prosthesis supported on natural and implant telescopic abutments.

Figure 13 Five-year follow-up of mixed natural and implant abutment supported removable prosthesis.

Figure 14 Angled implant abutments to accommodate available bone.

Figure 15 Completed prosthesis on natural teeth and poorly angled implant fixtures.

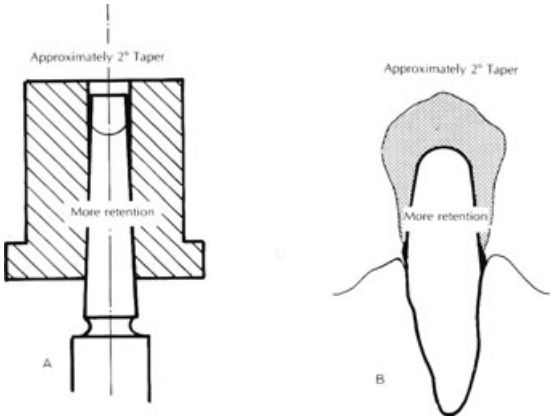

Figure 16 A small taper angle furnishes more retention.

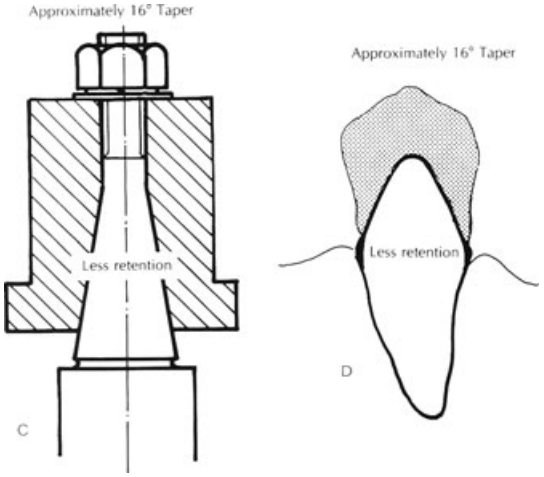

Figure 17 A larger taper provides less retention. This is self-releasing. NOTE: Figure not drawn to scale.

Bilateral splinting and restoration of unilaterally edentulous arches is possible because a major connector can be biomechanically linked to the overcrowns. In this case, the major connector is soldered to the overcrowns (Figs 5, 7, and 10).

Implant fixtures also allow for the upgrading of restorations. Two fixtures in the symphysis of a mandible can support an overdenture, whereas placing two additional fixtures in the body of the mandible can also be used to support a crown-sleeve-coping prosthesis. Two or four more fixtures make a fixed prosthesis possible.

In a situation where there may be significant soft tissue loss and restoring the soft tissue is necessary for esthetics, the restoration may be enhanced by connecting a flange to the abutment overcrowns and by designing the prosthesis to be removable to facilitate oral hygiene maintenance by the patient. A telescopic prosthesis may even serve as an appliance to control bruxism because it has some degree of resiliency (Figs 11 and 12).

In the past, telescopic retainers were perceived as having the disadvantages of increased bulk, unesthetic results, and increased cost. These obstacles are not as significant as they may have once been. New light-cured resin materials, bonding techniques that allow these resin materials to be bonded directly to metal overcrown frames, and less-expensive alternative casting alloys have substantially removed the obstacles to this modality of treatment.[5]

Over the past 50 years, we have seen tremendous advances in the restoration of partially and completely edentulous mouths. Dentists now recognize that proper oral hygiene and the ability to perform proper oral hygiene are the most significant prophylaxes of periodontal disease and dental caries. Once a person has suffered tooth loss or tooth mobility as a result of periodontal disease, trauma, dental caries, or iatrogenic dentistry, the most significant factor in maintaining a restoration of lost or mobile teeth is the ability to clean the abutments and the restoration. Although an often-overlooked technique, the use of telescopic retainers continues to allow treatment options for prostheses that facilitate access for cleaning by the patient and/or dentist and retain questionable teeth longer.

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