One would have to agree that in the past 20 years the advancements in implant dentistry have allowed us to significantly change the quality of our patients’ lives.

Educational institutions have changed their curriculums to include both the surgical and prosthetic techniques of implant dentistry to remain current and competitive. Sadly, many of our older prosthodontic techniques are now being taught less frequently in schools in favor of their implant counterparts, and are thus becoming lost art forms.

The patient ultimately suffers when implants are not a clinical solution or are financially too far out of reach. Stress breakers and precision attachments, once commonly fabricated, are no longer prescribed. It’s time to reinvent some of these lost art forms and techniques with materials readily available to us.

*Continued on p. 50*
An extremely underutilized technique is the use of telescopic copings in fixed and removable prostheses. The use of gold copings was first introduced as a fixed partial denture retainer at the beginning of the 20th century. It was not until the 1950s, however, when the concept of the telescopic coping was reported to overcome the problem of abutment parallelism during the fabrication of fixed partial dentures.

**Telescopic copings**

The telescopic or primary coping concept was then successfully applied in extensive prosthodontic treatments for periodontally compromised patients for many years—until the advent of dental implants.

The telescopic crown is defined as an artificial crown fabricated to fit over a coping.

“Each primary coping is usually fabricated parallel to the adjacent copings with an average wall taper of a 6-degree angle of convergence. The copings are definitively cemented to abutment teeth, and then a fixed prosthesis as a secondary structure is fabricated over the copings and placed with different types of cements or medium.”

Dr. James D. Weaver outlined a series of three advantages and disadvantages of telescopic prostheses in one study. The primary advantages he outlined include:

1. Excellent fit of copings to the prepared teeth may reduce the possibility of recurrent caries on the abutment teeth when a long-span fixed partial denture is fabricated, or when abutment teeth have different degrees of mobility. We’ve all seen cases of long-span bridgework start to fail because of recurrent caries on an opened margin (Fig. 1).

2. Aligning abutments for the fabrication of a fixed partial denture without over-reducing tooth structure. This is one of the most difficult challenges when dealing with multi-abutments with long-span bridgework (Fig. 2).

3. Potential ability to retrieve superstructure, which is usually placed on the copings with provisional medium (temporary cement). This feature may allow removal of the superstructure when there is a need for additional periodontal or endodontic therapy, extraction of failed abutments, or implant placement after the completion of prosthodontic treatment (Fig. 3).

Furthermore, Weaver added additional advantages to telescopic copings due, in part, to the dental materials readily available to date.

Correction copings may be used in aesthetic cases where one must deal with a dark preparation (Fig. 4). The correction coping can be fabricated of an opaque ingot that blocks out the dark preparation. This coping can then be externally stained to...
match either the adjacent preparation or adjacent tooth structure. (Details about this procedure appear later in this article.)

Another advantage of these copings can be found in large-span bridge work with the presence of a pier abutment. A pier abutment, also known as an intermediate abutment, is a natural tooth between terminal abutments that serves to support a fixed or removable dental prosthesis. A typical example is when the patient is missing the maxillary first molar and maxillary first premolar on the same side. The maxillary second premolar is the pier abutment between the canine and the second molar15 (Fig. 5). A pier abutment requires a nonrigid connector if it’s going to be restored with a fixed prosthesis.17

Disadvantages

Telescopic copings presented some disadvantages that limited their uses to specific clinical situations:
• Fabricating copings and superstructure involves more complex laboratory and clinical procedures, such as additional casting and clinical remounting.
• Laboratory costs and treatment fees are generally increased, and thus the restorative treatment plan will have a higher cost for the dentist to cover these fees.
• In the past, the use of the conventional telescopic prosthesis may not have been recommended when there was a high aesthetic demand, because the copings were traditionally fabricated from a gold or similar alloy.
• It may be difficult to place both the gold collar of the coping and the metal margin of the superstructure subgingivally if a patient presents with high lip line at smile and thin, delicate gingival tissue around anterior abutment teeth. This gingival tissue biotype is more prone to recession, possibly caused by prosthodontic procedures such as tooth preparation and impression making16–20 (Fig. 6).

Advantage: lithium disilicate

Previous studies and articles have used porcelain or zirconia copings to manage the obvious disadvantages in aesthetic cases.16,20,21 This article will demonstrate the use of E.max (lithium disilicate, Ivoclar Vivadent) copings and discuss its advantages over traditional gold and zirconia copings.

Handling a dark preparation: Many of us have had the aesthetic case of two or more anterior aesthetic restorations where one of the teeth has a dark preparation. (Figs. 4 and 7). Typically, a dark preparation is handled by using an opaque restorative medium such as a porcelain fused to metal or zirconia crown.

The issue becomes that the opaque restorative materials tend to be slightly higher in value and offer less natural fluorescence than adjacent natural teeth or restorations. The treating practitioner is typically forced to make one, both or all restorations more opaque to compensate for the dark preparation.

The result can be an aesthetic failure. In the case where one or two teeth were treated, these restorations will not match the adjacent natural teeth in value and will appear brighter than the adjacent natural teeth. In the case of a cosmetic smile design the restorations will all be of a higher value, and the added opacity or brighter appearance can result in an artificial appearance.

The solution is to fabricate an E.max correction coping, which can be made of an opaque ingot, to block out the underlying dark preparation. The coping is then externally stained to match the adjacent, normal preparation (Fig. 8).

The telescopic crown can then be made of the same ingot as the adjacent crown’s. This provides several benefits over gold or zirconia copings. One, it allows the practitioner complete control of value by utilizing warming (lower value) or brightening (higher value) try in pastes and cements.

Secondly, considering that the coping is being used as a block-out medium and not being used as a stress-breaker, the coping can be bonded to the tooth using a total-etch technique (recommended because the coping is typically less than 1.5 millimeters thick), as well as the ability to bond the E.max coping to the E.max crown. Lastly, the telescopic crown allows practitioners to use one cement for the entire case, rather than multiple materials, as was recommended in traditional coping cases.
**Walkthroughs**

The first steps are to bond the E.max coping to the tooth and to choose the correct value of cure cement to bond the crown to the coping and adjacent restorations to the natural teeth. Next, while the adjacent teeth will be treated with phosphoric acid, the coping can be treated with Monobond Etch and Prime (Ivoclar Vivadent), which has received FDA clearance for intraoral use as a safe alternative for hydrofluoric acid.

The bonding agent can then be placed and polymerized on the adjacent teeth only. This means waiting to place the bonding agent on the coping until just before placing the restorations loaded with cement. The cement and bonding agent between the correction coping and the crown is polymerized using the sandwich technique. The result is an aesthetic, all-ceramic smile with the block-out result of a metal coping (Figs. 9 and 10).

**CASE STUDY:**

**HANDLING A MESIALLY TILTED MANDIBULAR MOLAR**

Although the incidence failure of fixed partial dentures from mandibular second premolar to second molar (replacing the mandibular first molar) is difficult to determine in the natural dentition, this practice is contraindicated without a nonrigid connector in implants because of mandibular flexure.

When a mandibular first molar is missing for an extended period, the second molar typically tilts mesially into the edentulous space. The torsion and flexure rate on the abutments has now been altered because of the difference in the long axis positions of the roots. When restored with a nonrigid connector, one of the abutments typically debonds or suffers cement failure, resulting in recurrent caries and prosthetic failure.

The solution is a telescopic coping bridge. If the patient is concerned about aesthetics—the gold coping showing (Fig. 11)—or the treating practitioner is concerned about using various temporary cements for the prosthesis, E.max telescopic copings are one solution. These copings can be fabricated and bonded to the abutments using a total-etch technique and either dual-cure or light-cured-only cement (Fig. 12).

The final prosthesis can be cemented with a resin-reinforced glass ionomer or self-etching resin cement (Fig. 13).
CASE STUDY:
HANDLING A PIER ABUTMENT

One of the forgotten prosthetic concerns and treatments is the presence of a pier abutment. A pier abutment, also known as an intermediate abutment, is a natural tooth located between terminal abutments that serves to support a fixed or removable dental prosthesis (Fig. 5, p. 51).

If treating this case with a fixed prosthesis, it is necessary to use a nonrigid connector, such as a stress-breaker or telescopic coping.

Case example: A 48-year-old woman presented to the office, unhappy with her smile and the fact she was missing multiple teeth (Figs. 5, 14–17).

Clinically, she was missing teeth #3, #5 and #14 in the maxillary arch, with low-lying maxillary sinus around #3, and converging root services in edentulous area of #5. The patient was unwilling to perform maxillary sinus lift surgery or orthodontics.

Conventional gold telescopic copings would have been visible in the smile, and a traditional precision attachment fixed prosthesis requires porcelain fused to metal materials. The decision was made to move forward with E.max telescopic copings (Fig. 18).

E.max pressed to zirconia was used for the telescopic bridgework (Fig. 19) and adjacent veneers, crowns. The patient elected to stage her treatment starting with #2–#12, and to return for the bridge #13–#15 later. The result was an aesthetic outcome, with the predictability of a traditional nonrigid connector technique (Figs. 20–23).
CASE STUDY:
HANDLING A MULTI-ABUTMENT AESTHETIC RECONSTRUCTION

When handling multiple-abutment, large reconstruction/prosthetic cases, it can be difficult to align the abutments properly without over- or underprepping the case. As previously discussed, the use of telescopic copings has multiple benefits in these cases. Previously, the need to use gold telescopic copings could be contraindicated in cosmetic cases. (Fig. 6, p. 51).

Case example: A 69-year-old man presented to the office unhappy with his smile and aware that his anterior teeth required extraction because of severe periodontal disease. The level of bone loss and trauma from occlusion potentially required the patient to have block grafting performed for implants, which he did not want. A secondary option of a telescopic prosthesis was presented and accepted by the patient.

Teeth #7–#10 were extracted and the patient underwent a three-month temporary treatment phase to allow healing of the gingival tissues, as well as to allow restoration of the lower arch to restore the vertical dimension of occlusion. Treatment also included replacing the missing posterior teeth with a precision allow restoration of the lower arch to restore the vertical dimension of occlusion. The level of bone loss and trauma from occlusion potentially required the patient to have block grafting performed for implants, which he did not want. A secondary option of a telescopic prosthesis was presented and accepted by the patient.

Once the tissue was deemed stable, the secondary treatment phase of the maxillary arch included E.max copings on #4–#6 and #11–#13 (Fig. 27) with a telescopic zirconia bridge (Figs. 28 and 29).

Fig. 24
Fig. 25
Fig. 26
Fig. 27
Fig. 28
Fig. 29

Conclusion

Telescopic copings have proven to be a viable alternative for implant prosthetics in cosmetic cases without the limitations it once had in the past. They can also be considered a first-line treatment option in cases when handling dark preparations. With these added treatment alternatives, dentists can now provide a time-tested, predictable, long-term outcome with the benefit of new age cosmetics.

References

16. Fixed partial denture supported by all-ceramic copings: a clinical report. Pellocchia R1, Kang KH, Horayama H.