Advanced restorative techniques and the full mouth reconstruction – The use of gold copings in bridgework

Part 10

In the last part of the series, Paul Tipton looks at the use of gold copings in bridgework

By Prof. Paul Tipton, UK

Introduction

From the studies produced by Lindhe and Nyman, described earlier in the series, it would certainly seem possible to succeed with long span bridge work, provided many of their criteria for success are followed, such as occlusal design, margin placement, oral hygiene etc. The other important aspect of this type of longer span bridgework is to control the stress on cement lutes, where failure can readily occur. This is achieved in the Lindhe and Nyman bridge design by using the technique only for mobile abutment teeth. When the prognosis of longer span bridge work is in doubt because of the loss of many units or non-mobility of abutments, gold copings can be used (Robertson, 1986). Copings (otherwise known as telescopic crowns) were originally used to overcome problems of parallelism in relation to the path of insertion of fixed restorations (Amsterdam, 1974).

Type of Coping

The gold coping is a thin crown, 0.7 mm thick, that is waxed directly onto the dies and usually cast in yellow gold. They are made parallel to each other and can be sandblasted by the technician for extra retention (Fig. 1 to 3) (Newburg, 1978). The margins are polished, however, as they will be exposed in the mouth. These copings are permanently cemented over the remaining abutment teeth with a traditional hard cement, such as zinc phosphate. The long span bridgework is then made in the conventional manner and cemented over the gold copings with a softer cement such as zinc oxide and eugenol such as ‘Temp-bond’ (Kerr). Should excess stress be transferred to the cement lute then one or more of the soft cement lutes will preferentially fail. Because the copings have been made parallel to each other there is a reasonably good retention of the bridge, however, even without cement. When all the cement lutes fail and the cement washes out the patient will usually re-attend for further cementation with more soft cement.

It is unlikely that caries will occur under the bridgework because the tooth structure is protected by the gold coping. Bridge work margins are placed above or incisal to the gold coping margins so that periodontal problems can be avoided. This style of bridge design does however require more aggressive tooth removal as an extra 0.6 mm is required for the extra thickness of the gold coping and cement lute. Alternatively, a non-precious coping can be fabricated when required, bringing the thickness of the coping down to 0.3 mm.

Screw Retention

One or more screws can also be incorporated into the restoration so that when the cement lute fails the bridge-work does not fall out of the mouth but is retained by the screws. This gives the patient added confidence in his restoration (Fig. 4 to 6). It is especially useful in the upper jaw. Careful preparation techniques are required for this type of retention as the screw could (in certain situations) pull the coping off the tooth, leading to an increased risk of caries. The screws are usually placed into the end abutments, which require special tooth preparation. The end abutment is prepared so that it is tilting distally, allowing for a distal path of insertion of the coping. Bridgework usually uses a cement with a low gold. They are made parallel to each other and can be sandblasted by the technician for extra retention (Fig. 1 to 3) (Newburg, 1978). The margins are polished, however, as they will be exposed in the mouth.

Uses

One of the major advantages of this style of bridgework is the flexibility it brings to a restoration. In theory, the bridge can be removed by untapping (and unscrewing) so that problems with abutment teeth and periodontal disease can be treated. In this manner, periodontal maintenance is more easily achieved, root fillings and cast posts and cores can be fabricated without drilling through the superstructure and teeth can be removed, roots resetc and the bridge modified prior to recementation (Fig. 7 to 10).

Further abutments may be added by soldering new retainers or attachments and anticipating future modifications (Kaldab, 1976). Be aware, however, that this type of bridge cannot be removed for bone loss inauguration without the increased risk of porcelain fracture whilst in the furnace due to saliva contamination. Multiple unit bridgework when cemented on mobile abutments often fails to seat adequately unless venting is performed. An alternative is the use of copings where an incomplete seal and seat is less detrimental (Faucette, 1987). This type of bridge is often used as an interim prosthesis whilst implants are placed around the tooth abutments to take the patient from a tooth-supported bridge to an implant-supported bridge without the need for a removable prosthesis.

Aesthetics

Aesthetics can be compromised by this type of bridge because – as previously mentioned – extra tooth prepa-
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Endodontic treatment, retreatment and permanent cementation of full ceramic CAD/CAM crown in one visit

Clinical case

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Introduction

One visit dentistry is becoming more and more popular among patients nowadays. The reasons behind are various – lack of time due to work, unwillingness to come several times, parking issues, and many others. A rising demand for treatment that includes as few steps as possible is becoming a strong trend among patients. In some cases, all that needs to be done is acquire more knowledge on endodontic treatments, a suitable rinse protocol and usage of FRC pins. As far as the prosthetic work is concerned, modern chairside CAD/CAM systems allow to achieve a very high quality of fast and rapid post-endodontic completion and reinforcement of the tooth.

This study reports how one visit treatment can cover endodontic, endodontic retreatment, through usage of FRC pin, and permanent cementation of full ceramic crown, using MyCrown.

Patient first contact

52 years old woman came to our dental clinic with broken tooth no. 14 and asked for emergency treatment as the tooth is in the smile area and the patient stated she felt deficient and uncomfortable when working and speaking with people. (Fig. 1, Fig. 2) After taking an introral X-ray and status analysis, we suggested RCT (root canal endodontic retreatment), followed by treatment with FRC (fiberglass-reinforced composite) post and reconstruction with ceramic crown, made by CAD/CAM system MyCrown.

Endodontic treatment

During the treatment with Zeiss Opemi Pico microscope, it was found, that the palatal root canal was not treated at all. Subsequently, the ven-
ticular root canal retreatment and palatal root canal treatment were performed using a standard rinse protocol using 5% NaOCl 0.5% CHX and EDTA. To fill the root canals M-Twin system ISO 25/06% - gutta-percha and FRC post was introduced. Enlightenment with curing light 30 seconds. The crown preparation is clearly visible. (Fig. 3) Immediately after the endodontic treatment, the palatal part of the gingiva was removed by electrotome. The FRC ENA post was placed in the palatal root canal. After remov-
ing a portion of gutta-percha from the filled root canal, 6mm deep, the dentin was etched with orthopho-
phoric acid for 30 seconds and then rinsed with water from syringe for 30 seconds. The ENA bond was mixed with the polymerization acti-

References


Conclusions

Gold copings can be an excellent long-term, or provisional restoration, as the coping can protect the tooth from caries and cementation failure. Maintenance is made easier by the ability to remove the superstructure at will. Aesthetics can often be com-

caused by the need for greater tooth reduction and often two vis-

ble metal margins.

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Treatment with MyCrown

After shoulder preparation and pres-
ervation of all parameters for the next restoration, the tooth was pre-
depare for digital impression. Firstly, it is most important to make the
edge of the preparation as clear as possible. This is the most important
thing in defining the future resto-
storation. This has resulted in proper gingival management. In this case, a two-cord technique was used. (Fig. 5) A thinner fibre was first put into sulcus with haemostasis solution. Subsequently, a fibre with thickness 3, impregnated with aluminium chloride, was put for faster and bet-
ter haemostasis and retraction. After 3 minutes, the thicker fibre is drawn, the thinner one is left and the edge of the preparation is clearly visible.

Gingiva management

After shoulder preparation and pres-
ervation of all parameters for the next restoration, the tooth was pre-
depare for digital impression. Firstly, it is most important to make the
edge of the preparation as clear as possible. This is the most important
thing in defining the future resto-

Fig. 1: Subgingival tooth fracture

Fig. 2: First patient check

Fig. 3: During endo with FRC endodontic posts.

Fig. 4: After endodontic treatment

Fig. 5: Two-cord technique

Fig. 6: OPMI Pico microscope...