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The 7/8 Crown: A Lost Art

ST McGill • JR Holmes

Clinical Relevance

In the right situation, A 7/8 gold crown can be the most esthetic, as well as, the most durable alternative to a ceramic restoration.

SUMMARY

Historically, the longevity of teeth restored with gold inlays, onlays, crowns, and partial veneer restorations is excellent. However, in-office computer-aided design and computer-aided manufacturing restorations, laboratory-constructed all-ceramic bonded restorations, and conventional ceramo-metal restorations are more common. The high price of gold, the difficulty of the preparation, and the fact that most dental schools are de-emphasizing the teaching of partial veneer restorations has created a situation whereby the 7/8 crown is rarely viewed as the treatment of choice. Time and experience will determine if the new ceramic materials, along with the all-important bonding agents, can achieve the success of a well-done, all-gold restoration.

Patients today have increasing esthetic demands, and many new materials and techniques are advocated to deal with this issue. All-ceramic crowns, both fabricated and milled, as well as ceramo-metal restorations are commonly used with varying degrees of success. Some meet esthetic demands while failing from a strength standpoint, and others fall short from an esthetic perspective despite being serviceable over many years. Some obviously satisfy both requirements.

One option that is seldom used is the 7/8 crown, which, to a great degree, has become "a lost art." In the right situation it can be the most esthetic as well as the most durable alternative.

INDICATIONS AND CONTRAINDICATIONS

The primary indication for a 7/8 crown is to restore a maxillary first molar where the mesiobuccal enamel surface is intact. This eliminates the need for porcelain (or some other ceramic material),

Figure 1. *Occlusal reduction.*

*Samuel T McGill, DMD, assistant professor, Department of Oral Rehabilitation, College of Dental Medicine, Medical University of South Carolina, Charleston, SC, USA

J Robert Holmes, DDS, MS, MEd, professor and director, Division of Restorative Dentistry, Department of Oral Rehabilitation, College of Dental Medicine, Medical University of South Carolina, Charleston, SC, USA

*Corresponding author: 173 Ashley Ave, Charleston, SC 29425, USA; e-mail: mcgillt@musc.edu

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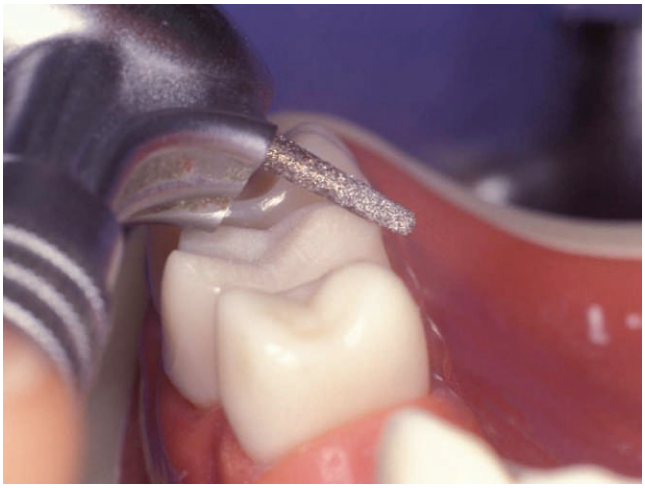

Figure 2. *Functional cusp bevel.*

Figure 3. *Axial reduction and proximal extension.*

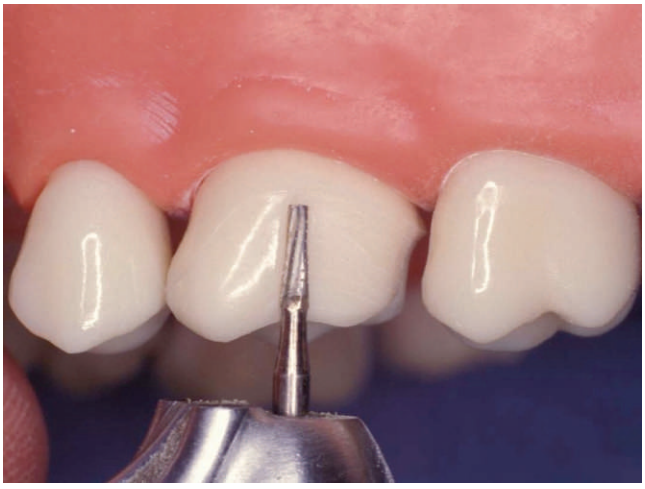

Figure 4. *Proximal and buccal grooves.*

Figure 5. *Occlusal offset.*

which is not as durable as gold, and it also has the esthetic advantage of maintaining natural tooth structure.[1]

The primary contraindication for a 7/8 crown is when there is some defect or esthetically compromised quality in the buccal enamel of the mesiobuccal cusp.

STEPS IN TOOTH PREPARATION

Tooth preparation for a 7/8 crown is more difficult than that of a full veneer crown and needs to be accomplished precisely. This relative difficulty is

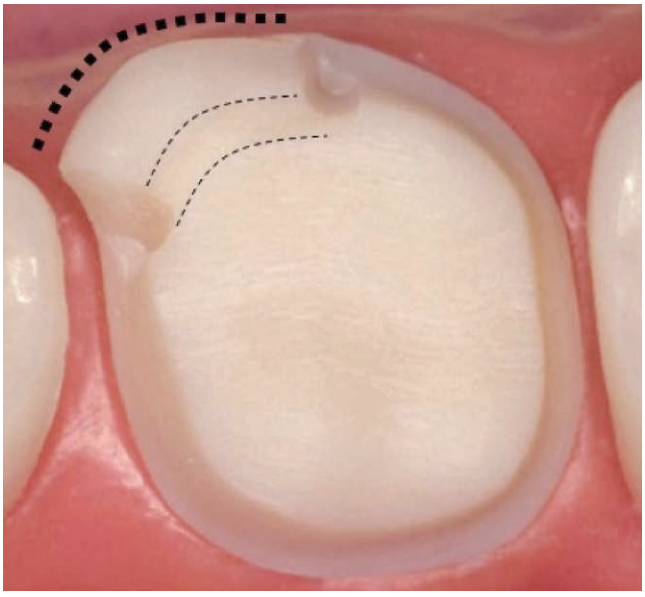

Figure 6. *Occlusal offset follows contour of mesiobuccal surface.*

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Figure 7. *Buccal reverse bevel.*

probably the primary reason this type of restoration is rarely used. The steps are as follows:

Step 1: Occlusal Reduction[2]

Occlusal reduction is accomplished in the same manner as for a full-veneer gold crown on the lingual cusps and distobuccal cusp (Figure 1). The reduction on the mesiobuccal cusp tapers out from the normal amount in the central groove area to about 0.3 mm at the cusp tip in order to avoid a resultant excessive display of metal when the mesiobuccal cusp reverse bevel is placed (see step 6 below).

Step 2: Functional Cusp Bevel

A functional cusp bevel is placed on both lingual cusps to provide additional metal thickness in this area (Figure 2). The bevel is placed at an angle consistent with the opposing tooth cusp/fossa angle (usually 30°-45°).

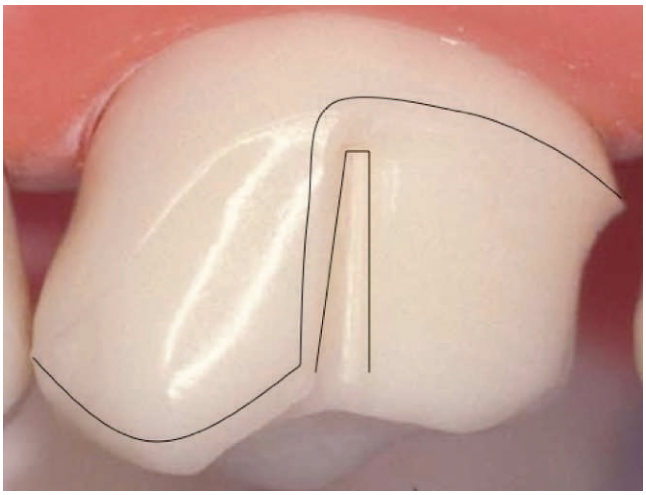

Figure 8. *Buccal reverse bevel (note position relative to groove).*

Figure 9. *The 7/8 crown preparation (note remnants of the crack still visible on the lingual).*

Step 3: Axial Reduction and Proximal Extension

The axial reduction should extend from a point that includes the buccal groove around the distal and lingual surfaces and includes the mesial surface to just short of the mesiobuccal line angle (ie, 7/8 of the axial surface). Proximal extension should result in contact being broken slightly at the mesiobuccal (Figure 3). A chamfer finish line is recommended.

Figure 10. *The 7/8 crown preparation (buccal view) showing mesial extent of preparation (hidden behind height of contour of tooth no. 4), 0.75-mm reverse bevel of mesiobuccal cusp, and buccal groove (hidden behind height of contour of mesiobuccal cusp of the tooth itself).*

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Figure 11. *Completed restoration (occlusal view).*

Figure 12. *Completed restoration (retracted facial view).*

Figure 13. *Completed restoration (close-up view). Gold is not visible.*

Figure 14. *Completed restoration (conversational distance) exhibiting esthetic success with maximum strength.*

Step 4: Proximal and Buccal Grooves

The proximal and buccal grooves should be placed parallel to each other and in line with the overall path of draw (Figure 4). A flat-end diamond or carbide is recommended. The entire groove should be within the axial reduction of the preparation and not extend fully to the cavosurface angle The proximal groove should be placed near the cavosurface mesiobuccal proximal extension without undermining the enamel surface (see also Figure 6).

Step 5: Occlusal Offset

The occlusal offset is a shallow trough that connects the two grooves and provides rigidity to the casting (Figures 5 and 6). It provides a bulk of metal to reinforce the thin reverse bevel of the mesiobuccal cusp and acts as an auxiliary sprue during the casting process. It is prepared with a flat-end diamond or carbide bur held at a 45° angle. The

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occlusal offset should follow the contour of the external surface of the tooth.

Step 6: Buccal Reverse Bevel

The buccal reverse bevel is a thin band of metal covering and protecting the mesiobuccal cusp and prepared with a diamond at about a 45° angle (Figures 7 and 8). It is approximately 0.75 mm in dimension (occluso-gingivally) and follows the normal contour of the unprepared mesiobuccal cusp. If properly prepared it will strengthen the cusp and not be visible against the dark background of the mouth.

CLINICAL CASE

The patient is a 25-year-old esthetically conscious woman with a cracked maxillary first molar. The tooth was symptomatic to heat, cold, and biting pressure (Figures 9–14). Upon completion of the restoration, the tooth was restored to normal function with complete esthetic success. With proper maintenance the clinician can comfortably assure the patient many years of service without concern of breakage had ceramic materials been used. In addition, the tooth has been more conservatively prepared.

Conflict of Interest

The authors of this manuscript certify that they have no proprietary, financial, or other personal interest of any nature or kind in any product, service, and/or company that is presented in this article.

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