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The Tucker Technique

Cast Gold Molar Proximal ½ Crown

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SUMMARY

The molar proximal half-crown cast gold restoration may be an ideal choice for the conservative treatment of teeth with only one compromised proximal aspect.

INDICATIONS

Cast gold restorative material is indicated when superior strength and longevity of service are desired. The half-crown may be chosen when only one proximal portion of a tooth is broken down by caries, cusp fracture or previous restorative materials, while the other proximal portion is intact and sound. The half-crown may be placed on either the mesial or distal half of the tooth under treatment and is highly esthetic when placed on the distal of maxillary molars. Limiting factors include inadequate remaining tooth structure of the compromised half to provide adequate retention and resistance, encroachment upon the intact proximal surface via existing buccal or lingual caries or fillings, or incipient horizontal fractures at the base of cusps to be preserved.

TECHNIQUE

After evaluation and possible modification of opposing plunging cusps and anesthesia administration, a rubber dam is placed (Figure 1). All of the existing restorative materials and caries are then removed (Figure 2).

Figure 1. *Tooth #15 preop view showing failed large amalgam.*

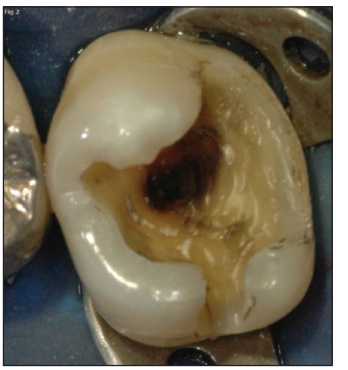

Figure 2. *Amalgam and caries removed. Note the intact mesial surface.*

Figure 3. *The intaglio surface of casting. Note the grooves and bar creating added resistance, retention and reinforcement.*

Figure 4. *Final prep. Note the axial grooves connected by occlusal groove.*

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Careful evaluation of the tooth for unsuspected cracks, severe undermining of the cusps and the presence of adequate sound tooth structure beyond the proposed restorative margin will then allow for the final choice of the half-crown preparation.

At this time, tentative placement of the buccal and lingual axial walls is determined. Both must extend onto sound tooth structure gingivally and axially beyond the lesion. For finishing purposes, the buccal margin is placed so as to avoid being directly in the buccal groove. It is also determined whether an extension of the existing filling into the occlusal portion of the intact half of the tooth will require an inlay component to the final restoration. A buildup using material of choice is then placed.

The initial occlusal reduction is performed using a straight diamond bur (Brasseler KS2-014, Brasseler USA, Savannah, GA, USA), which is extended to just short of the anticipated position of the axial walls. Proximal and axial reductions are made using a flame-shaped diamond (Brasseler 860-012 or 860-014), taking care to extend the buccal and lingual walls only to the previously determined location.

Additional resistance and retention features, drawing with the rest of the preparation, are added next. Buccal and lingual grooves are placed using a round end taper diamond bur (Brasseler 8856.31.016) to a depth of approximately 1 mm at the leading edge of their respective axial reductions. These grooves form a butt joint at the cavosurface and determine the visible outline of the casting. Using a straight fissure #56 carbide bur, the occlusal inlay preparation is completed (if indicated), and the occlusal groove is prepared to a depth of 1½ mm, connecting the buccal and lingual axial grooves. The length and parallelism of the axial grooves, in concert with the occlusal groove, together form a thick "U"-shaped staple at the medial aspect of the preparation. They act together to add significantly to the retention and resistance of the preparation. They also serve to add bracing and stiffness to the gold casting, which counters possible distortion or springing open of the margins under occlusal forces (Figure 3).

Using the same straight fissure bur, the occlusal table is smoothed and the inlay portion (if present) is blended into the rest of the preparation.

The buccal and lingual groove cavosurface margins are refined with a medium garnet disc to eliminate any irregularities in the walls or weakened enamel. An occlusal bevel is placed on the inlay extension (if present) using a new #56 fissure carbide bur to complete the preparation (Figures 4, 5 and 6). These final steps in the preparation sequence provide a very sharp cavosurface margin for laboratory fabrication of an accurate casting and ease of finishing at the delivery appointment.

Placement and finishing of the casting at the seating appointment are accomplished by a series of discs, strips and polishing powders, to achieve a highly refined tooth to gold interface (Figures 7, 8 and 9).

The highly retentive cast gold half-crown, when carefully selected, prepared and finished, allows for conservation of tooth structure via preserving an intact proximal half (Figure 10) and possible preparation of supragingival margins (Figure 11). It is also a very

Figure 5. *Prep buccal view. Note the length, depth and crispness of the buccal groove.*

Figure 6. *Prep lingual view. Note the lingual groove configuration.*

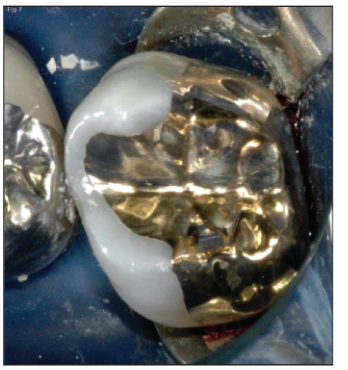

Figure 7. *Final finish occlusal view. Note the marginal integrity, flowing outline and high polish.*

Figure 8. *Final finish palatal view.*

Figure 9. *Final finish buccal view.*

Figure 10. *Occlusal view, rubber dam removed. Note the intact mesial proximal surface.*

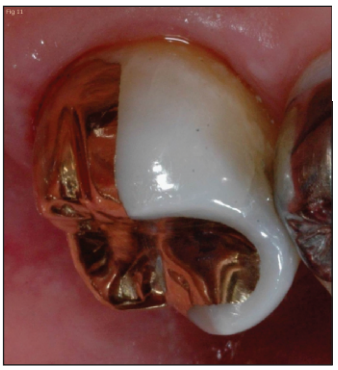

Figure 11. *Palatal view. Note the supragingival margin.*

Figure 12. *Buccal view. Note the supragingival margin, gold hidden behind the height of the contour of the MB cusp. No need for porcelain shade matching.*

Figure 13. *Final finish occlusal view. Note the marginal integrity, flowing outline and high polish.*

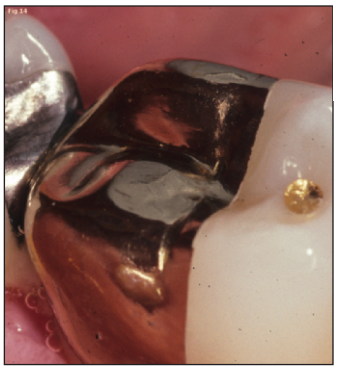

Figure 14. *Tooth #30 distal half crown with gold foil in the mesial occlusal pit. (Restorations by Richard V Tucker, DDS.)*

Figure 15. *Tooth #2 distal half-crown with inlay extension.*

Figure 16. *Tooth #31 mesial half-crown with inlay extension.*

Figure 17. *Tooth #3 mesial half-crown, PFM.*

esthetic solution to maxillary molars, as the gold is hidden behind the height of contour of the untouched mesial portion of the tooth and there is no need for shade matching (Figure 12).

Restorative variations (Figures 13 through 16) demonstrate the flexibility offered by this preparation to treat numerous clinical indications.

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