The Marginal-Ridge Rest Seat

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Abstract

Natural canine crowns are preferred as abutments for removable partial dentures because of their root morphology and bony support. However, preparing the rest seat on the lingual surface of a mandibular canine risks perforating the enamel. An alternative rest-seat preparation, on the marginal ridge of the canine crown, conserves tooth structure and provides a rest seat of adequate length and depth to ensure support for a cast framework. To illustrate why this little-discussed rest-seat preparation has endured locally, the rationale and preparation of the marginal-ridge rest seat is discussed from both historical and clinical perspectives.

MeSH Key Words: *cuspid; dental abutments; denture design; denture, partial, removable*

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The preparation of a marginal-ridge rest seat on a mandibular canine abutment tooth used to support a removable partial denture has been advocated and used in the Faculty of Dentistry, University of Manitoba, Winnipeg, for more than 30 years. This clinically useful concept for rest-seat preparation has not been widely discussed or used outside our institution. In this article the rationale for this type of rest-seat preparation and the preparation steps are discussed from both historical and clinical perspectives.

Historical Perspective

Kennedy[1] has credited Bonwill with laying down, in 1807, the fundamental principles of clasp design, namely encirclement and 3-point contact for effective clasping and retention. Bonwill's 3 points of contact were the ends of each of 2 clasp arms and a resting lug, the predecessor of the modern rest. The purpose of the resting lug was to support a partial denture and serve as a contact point to prevent food from becoming jammed between the clasp and tooth.[1,2] The resting lug was bent from the body of a flat plate or round wire clasp and was often strengthened with solder. The preferred position for the lug was on the occlusal surface; however, preparation of a rest seat in the tooth surface was deemed necessary only if there was insufficient space for the lug.

Applegate[3] and Swenson and Terklo[4] stressed the importance of preparing a recess in the tooth surface into which the rest could be seated. Applegate[3] advocated an occlusal rest, making little mention of rests on the anterior teeth. However, Swenson and Terklo[4] outlined various forms of rest seats on anterior teeth. Such rest seats were located primarily on the canines and were described by McCracken[5] as follows.

Rest-Seat Designs for Anterior Teeth

1. An occlusal rest seat on the cingulum of the maxillary canine.
2. A circumferential lingual shoulder on either the maxillary or mandibular canine.
3. An incisal rest on the mandibular canine.
4. A cingulum rest (for cast restorations).

In a little-known text, *Handbook of the Fundamentals of Partial Denture Planning*, Shillington[6] wrote that preparation of rests in anterior teeth could consist of "a notch cut at the angle with the base at right angles to the long axis of the tooth, an incisal rest, or a notch cut in the thick enamel of the marginal ridge" (p. 50). The accompanying diagrams in Shillington's text depicted notches cut at the angle of the incisal line or across the marginal ridge of a canine crown similar to Fig. 1. This later type of rest seat, prepared across the marginal ridge, was introduced and taught at our institution by Dr. H.W. Hart, a colleague of G.B. Shillington. Dr. Hart was a mentor for many of the faculty who have taught removable prosthodontics at our institution.

A review of the early dental literature often reveals the origins of practices that are all too often taken for granted. Because these early practitioners took the time to record and share their knowledge and clinical experiences, we are able to explain why this particular rest-seat preparation has endured locally.

Rationale for Using a Rest-Seat Preparation

The natural canine is a logical abutment for a partial denture because of its root morphology and bony support.[4] Most cast partial dentures can be expected to have at least one canine as an abutment.[7] Unfortunately, the opposing occlusion, as when the mandibular canine contacts the palatal surface of the maxillary

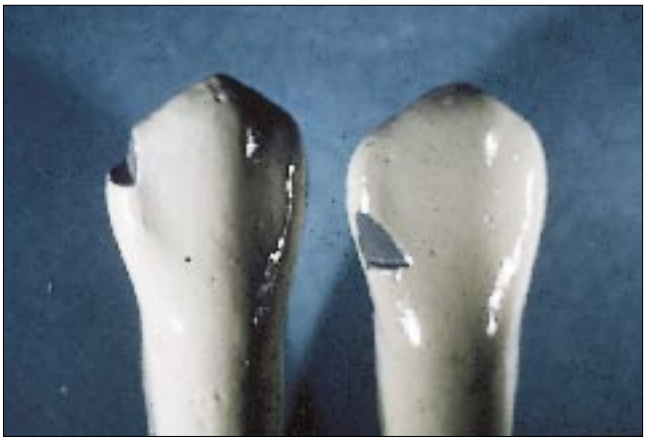

Figure 1: *Diagram depicting the difference between incisal and marginal rests.*

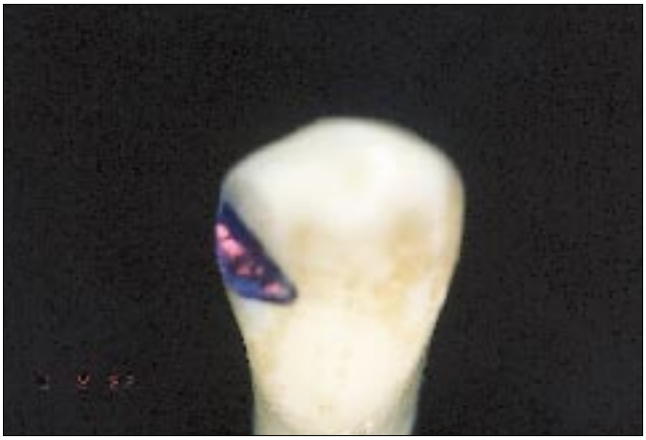

Figure 3: *The marginal rest in a natural canine crown. The rest seat is shaded.*

canine, or the anatomy and depth of enamel on the lingual surface of the mandibular canine, often precludes placement of an adequate rest seat in the natural tooth structure.[8] Rest seats of limited dimensions — depth or length — may be insufficient to provide contact and support for a cast framework.[9] Preparation of a cingulum rest seat or a ball-type lingual rest in a mandibular canine will normally result in perforation of the enamel;[8] hence the recommendation for rest seats in cast restorations, resin-bonded etched metal seats,[10] or bonded composite rest seats.[11]

The lingual surface of the mandibular canines presents many problems during rest-seat preparation. Because of its anatomic features and the potential for penetrating into the dentin, the result is often a shallow, narrow preparation. Likeman and Juszczyk[9] and Shillingburg and Grace[12] found that the average thickness of enamel on the lingual surface of mandibular canines was only 0.5 mm.

Preparation of a marginal-ridge rest seat in a natural canine crown is a conservative approach that takes advantage of the tooth's anatomy and that uses the portion of the clinical crown that has the thickest enamel (1-1.5 mm) (Fig. 2), that is positioned advantageously for leverage (in the middle third), and that is free of the opposing occlusion.

Figure 2: *Cross-sectional view of a canine crown. The left side has been sectioned in the middle third, incisogingivally. The right side has been sectioned in the gingival third. The enamel thickness in the middle third on the marginal ridge is evident.*

Guidelines for Preparation of a Marginal-Ridge Rest for Canine Teeth

Form

The form of the marginal-ridge rest seat is that of a notch. The seat is prepared at a 45° angle to the proximal surface, across the marginal ridge of the clinical crown. The seat is positioned incisogingivally in the middle third of the crown, with the base of the seat at a right angle to the long axis of the tooth (Fig. 3).

Dimensions

The rest seat, 2-3 mm long, is prepared across the marginal ridge and will be 1 mm deep at the apex of the notch (Fig. 3).

Preparation

The instrument used to prepare the rest seat provides the typical outline form and dimensions. A flat-ended shoulder diamond 1 mm in diameter is passed across the marginal ridge at a 45° angle to the proximal surface. The preparation is started by placing the tip of the diamond at the appropriate height (the middle third) and moving into and across the marginal ridge. As for all rest-seat preparations, the seat is prepared after reduction of the contours and preparation of the guide plane.

Conclusion

The marginal-ridge rest seat is a conservative preparation suited to natural canine teeth. The size of the preparation is sufficient to support the cast removable partial denture without risking penetration of the enamel on the mandibular canines. On maxillary canines the marginal-ridge rest can be used to ensure that the rest does not interfere in static and eccentric occlusion. This preparation is best done on the marginal ridge adjacent to the edentulous area, so that the resulting seat is of sufficient size to supply adequate contact for support. Clinically, it is important to adhere to the following guidelines.

1. Use an appropriate size and shape of diamond to provide adequate length and depth to the seat. Adhere to the recommended dimensions of the seat.

2. Adjust the cast framework using a suitable disclosing medium to ensure positive seating of the rest.
3. Plate the lingual surface of the canine to provide for bracing and encirclement. ❖

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References

1. Kennedy E. Partial denture construction. 1st ed. Brooklyn (NY): Dental Items of Interest; 1928.
2. Kennedy E. Partial denture construction. 2nd ed. Brooklyn (NY): Dental Items of Interest; 1942.
3. Applegate OC. Essentials of removable partial denture prosthesis. 1st ed. Philadelphia (PA): W. B. Saunders Co.; 1954.
4. Swenson M, Terklo L. Partial denture. 1st ed. St. Louis (MO): C.V. Mosby Co.; 1955.
5. McCracken WL. Partial denture construction. 1st ed. St. Louis (MO): C.V. Mosby Co.; 1960.
6. Shillington GB. Handbook of the fundamentals of partial denture planning. Ottawa (ON): Queen's Printer; 1957.
7. McArthur D. Canines as removable partial denture abutments. Part 1: Tooth rank and canine incidence. *J Prosthet Dent* 1986; 56:197-9.
8. Haisch L, Hansen C. Dentinal exposure resulting from ball rest seat preparations on mandibular canines. *J Prosthodont* 1993; 2:70-2.
9. Likeman P, Juszczyk A. An examination of cingulum rest seats in incisor and canine teeth. *Eur J Prosthodont Restor Dent* 1993; 1:165-71.
10. Lyon HE. Resin-bonded etched-metal rest seats. *J Prosthet Dent* 1985; 53:366-8.
11. Latta G. A technique for preparation of lingual rest seats in light-cured composite. *J Prosthet Dent* 1988; 60:127.
12. Shillingburg HT Jr, Grace CS. Thickness of enamel and dentin. *J South Calif Dent Assoc* 1973; 41:33-6, passim.