Rests and Rest Seats

10

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Rests are vital for removable partial dentures to perform their optimal function. In addition to their several advantages described in this chapter, their most important benefits are preventing the removable partial denture movement toward the tissue and transmitting the occlusal forces in a way that will not harm the abutment teeth. Their proper function can only be achieved, if they seat on the well-prepared rest seats. Unfortunately, rest seat preparation is overlooked by many dentists and preparations' size and shape shows variety even between the prosthodontists. In this chapter, different forms of the rests, their appropriate rest seat preparations, and bonded rest seats are described along with the necessary equipment.

10.1 Definitions

Partial denture rest A rigid extension of a fixed or removable dental prosthesis that prevents movement toward the mucosa and transmits functional forces to the teeth or dental implant.

Rest seat The prepared recess in a tooth or restoration created to receive the occlusal, incisal, cingulum, or lingual rest.

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10.2 Functions of the Rests

Rests are used to:

1. Transmit the occlusal forces from the prosthesis to an abutment along the long axis of the tooth (Fig. 10.1)
2. Resist the denture base movement toward the soft tissue
3. Prevent impingement on the gingival tissues
4. Maintain clasps in the desired positions
5. Prevent extrusion (displacement-migration) of the unopposed abutment teeth
6. Act as an indirect retainer in Kennedy Class I, II, and long-span IV partially edentulous arches (see Chap. 11)
7. Provide correct location of the denture in rebasing or altered cast impression procedures
8. Reestablish occlusion (Fig. 10.2)
9. Prevent food impaction (Fig. 10.2)
10. Contribute to horizontal stabilization when placed on the anterior teeth

10.3 Forms of Rest and Rest Seat Preparations

As a rule, a rest should be placed in the prepared rest seat. The rest seat preparation has to be performed in the manner described below in order to ensure the proper function of the rests. Preparations should be fabricated without

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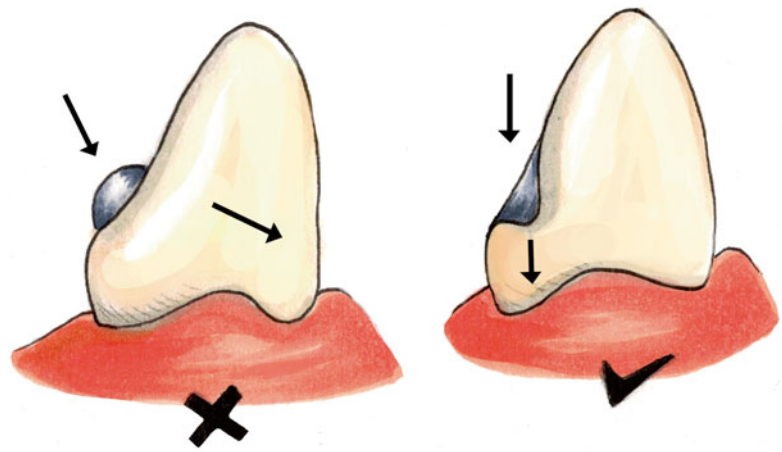

Fig. 10.1 A rest should be placed into a prepared rest seat. Otherwise, occlusal forces cannot be transmitted from the denture to an abutment along the long axis of the tooth

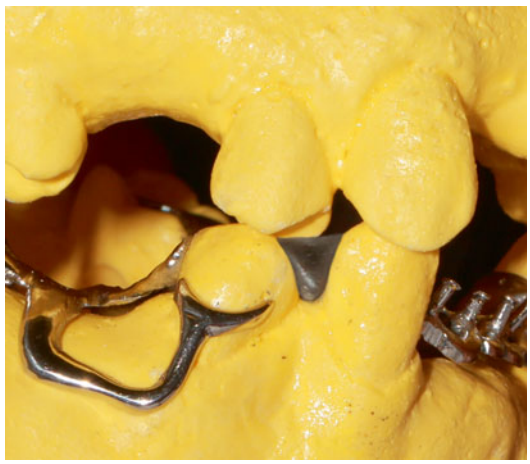

Fig. 10.2 Small spaces between teeth can be restored with back-to-back occlusal rests. Thus, reestablishing occlusion and preventing food impaction can be provided

undercut, sharp edges, and angles and should remain in enamel boundaries. There are three major forms of the rests.

10.3.1 Occlusal Rests

The form of an occlusal rest should be a round, triangular shape from the occlusal view. Its base should be at the marginal ridge and its apex should extend toward the center of the tooth. The floor of the rest seat should be spoon shaped from the sagittal view. The deepest part of an occlusal rest seat should be located near the center of the mesial or distal fossa. The size of the rest should be 1.0–1.5 mm with the tapering center of the tooth measuring 0.5 mm. If the rest does not have a sufficient bulk over the marginal ridge, which is the most critical dimension, rest fractures may occur. The recommended size of an occlusal rest is one-third to one-half the mesiodistal diameter of the abutment and approximately one-half the buccolingual width of the tooth measured between the cusp tips (Figs. 10.3 and 10.4).

The angle formed by the floor of the rest and the minor connector should be less than 90° so that the transmitted occlusal forces can be directed along the vertical axis of the tooth. If the angle is greater than 90°, the prosthesis can slip away from the abutment teeth. The appropriate angle can be achieved by preparing a spoon-shaped rest seat to avoid excess inclination, which is not recommended (Fig. 10.4).

Diamond burs with rounded ends and tapering sides can be used to prepare the rest seats (Fig. 10.5). Using a round-shaped bur may cause a rest seat with sharp edge or undercut.

Long box rests, which extend for more than half the mesiodistal width of a tooth, are used almost exclusively for the rotational path RPDs. This rest seat preparation is described in Chap. 12 (Fig. 12.14).

Onlay/overlay rests can be used on the tilted or infraoccluded teeth to restore occlusion or can be used for reestablishing occlusal vertical dimension and maximal intercuspal position in overlay removable partial dentures. This process requires minimal preparation, including

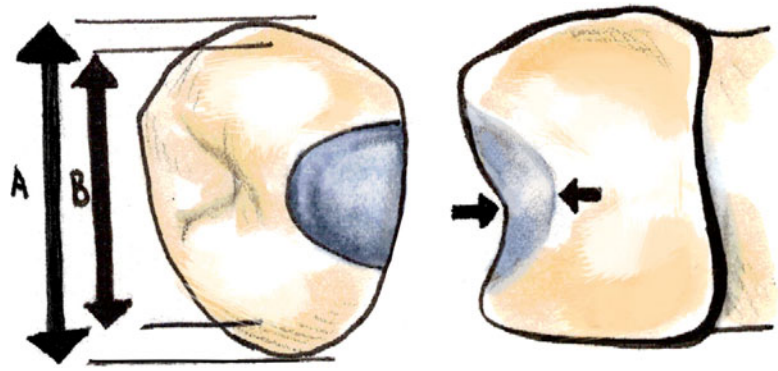

Fig. 10.3 *Left*: An occlusal rest size should be approximately A/3 or B/2. (*A*) Greatest buccolingual width. (*B*) The measurement between the cusp tips. *Right*: The depth of the occlusal rest should be 1–1.5 mm

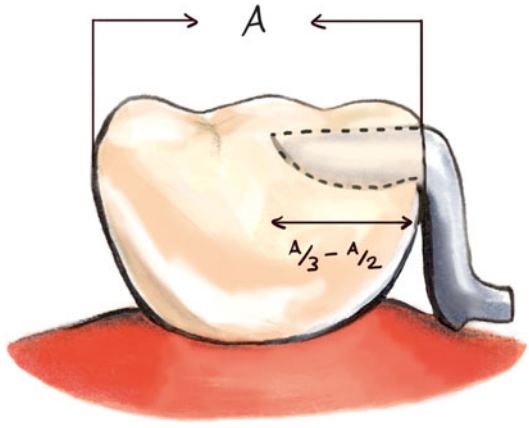

Fig. 10.4 A spoon-shaped occlusal rest should cover half or one-third of the mesiodistal length of the abutment tooth

pits, fissures, and grooves, or no tooth preparation. Tooth preparation should include a guiding plane, especially when tilted teeth do not have enough guiding surface.

When *interproximal* (*embrasure*) *occlusal rests* are made, preparation of the rest seat extends over the occlusal embrasure of two approximating teeth. It is essential to remove sufficient tooth structure (1.5 to 2.0 mm deep and 3.0–3.5 mm wide) at the facial and lingual surfaces of the abutments and to permit the component to be shaped that the occlusion will not be altered. Otherwise, fractures of the framework may occur. The contact between the teeth should be preserved to avoid tooth migration (Fig. 10.6).

A diamond bur with a rounded end and tapering sides is also suitable for this preparation.

10.3.2 Lingual (Cingulum) Rests

When posterior teeth are not present or available, *lingual rests* are utilized on anterior teeth, primarily on the canines. A satisfactory rest seat preparation can be made with minimal tooth reduction due to its well-developed cingulum (Fig. 10.7). If canines are missing, multiple incisors should receive rests to distribute the stress. It should be remembered that the preparation on lower anterior teeth may be risky because of the lack of thickness of their enamel.

A lingual rest seat preparation should be "V shaped" when viewed in cross section and "crescent shaped" when viewed from the occlusolingual aspect. The correct angulation of the floor of the rest seat should be less than 90° from the proximal view (Fig. 10.7). When a preparation has been made on a maxillary canine, the average dimensions should be 2.5–3 mm mesiodistally, 2 mm labiolingually, and 1.5 mm occlusogingivally. Preparation of a cingulum rest seat is accomplished using an inverted cone bur.

The most anterior teeth, especially in the mandible, do not present suitable contours or depth of enamel for adequate preparation. Additionally it may create cleaning difficulties. When a cingulum is poorly developed, with insufficient bulk for the preparation of a cingulum rest seat, a rest seat can be made using composite resin (Fig. 10.8) and resin-bonded Cr-Co cast or laminates. Also, a new metal-ceramic restoration with lingual rest seat can be fabricated (see Chap. 7 and Fig. 7.10). Although more detailed studies are needed, long-term studies showed that the *bonded rest seats* can

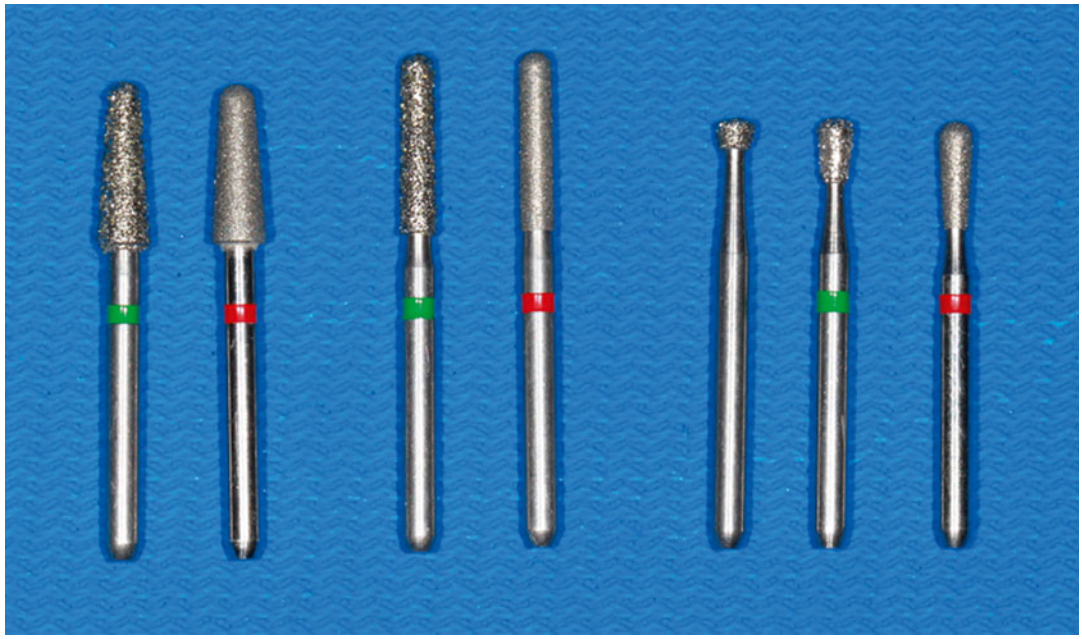

Fig. 10.5 The accessories for preparing rest seats

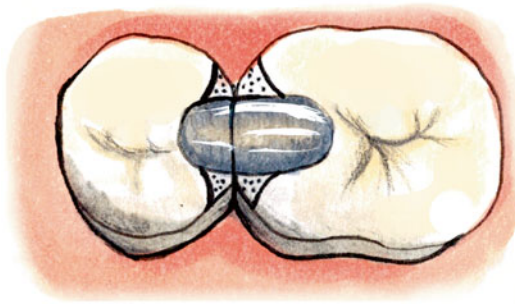

Fig. 10.6 An interproximal (embrasure) occlusal rest requires extra preparation of the dotted area. It is necessary to pay attention not to get loss of contact

provide acceptable strength and longevity without damaging the periodontal tissues of the abutment teeth. While resin-bonded metal rest seats or laminates are needed to prepare the tooth, composite resin rest seats can be fabricated by conserving the intact tooth and involving less cost. Rest seats are prepared at least 3 mm from the cervical gingiva. The cervical portion of the composite resin should not be over contoured, without sharp line angles, and should be well adapted and polished. It is also suggested to provide a composite resin rest seat after delivery of the RPD. The below-mentioned procedures should be followed: (1) A small groove is prepared as the floor of the rest on lingual surface of the teeth. (2) After impression taking, rest seat is waxed above the groove on the working cast and the framework is cast. (3) After the finishing of the RPD, the composite resin is filled in the gap and cured under the occlusal force. Thus, minimal preparation of the tooth and functional fitting can be provided.

Ceramic orthodontic brackets have also been used as rest seats. It should be remembered that the removal of these brackets results in heat generation.

In some instances (such as poorly developed cingulum, lack of clearance in the opposing teeth), *round rest seats*, which are spoon shaped like an occlusal rest seat, may be used. A reduction of the mesial marginal ridge is necessary to complete the preparation. Diamond burs with a rounded end and a tapering side, which match the tooth size, can be used to prepare the round lingual rest seats.

10.3.3 Incisal Rests

Incisal rests are less desirable than lingual rests, both aesthetically and mechanically. Whenever possible, a lingual rest seat on the natural tooth or

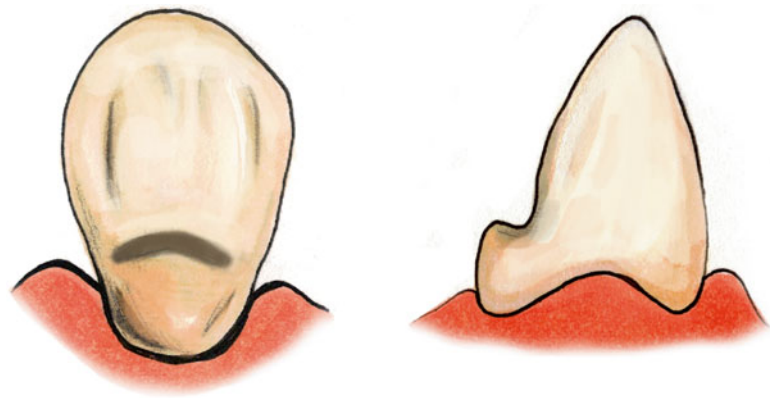

Fig. 10.7 A cingulum rest seat from lingual and sagittal view. The apex of the lingual rest preparation should be directed incisally

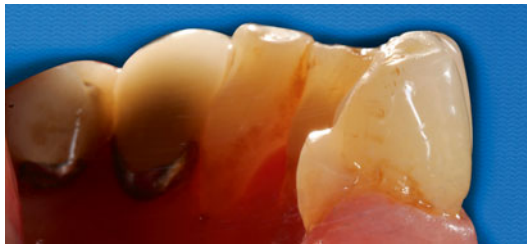

Fig. 10.8 A composite resin rest seat can be prepared when an anterior tooth has a cingulum with inadequate bulk for preparation

composite/cast/laminate rest seats should be preferred instead of an incisal rest. A crown restoration with a lingual rest seat also can be used when it is indicated.

Incisal rest seat preparation should be "V" shaped, placed on the mesial or distal incisal angle, and its deepest portion should be toward the center of the tooth. An incisal rest seat size should be approximately 2.5 mm mesiodistally and 1.5 mm occlusogingivally. The apex of the "V" should be rounded. An incisal rest seat has two parts slightly on the facial surface and a shallow one on the lingual surface (Fig. 10.9).

A silicone-based registration material or wax can be used to measure and verify the depth of the rest seat preparation (see Chap. 7, Fig. 7.9). This procedure is also useful for detecting whether there is an undercut or not. After finishing rest seat preparations, all sharp line angles and corners should be rounded and polished. Polishing is accomplished using a carborundum-impregnated rubber wheel or a low-speed hand piece. Fluoride should be applied after the first alginate impression because some

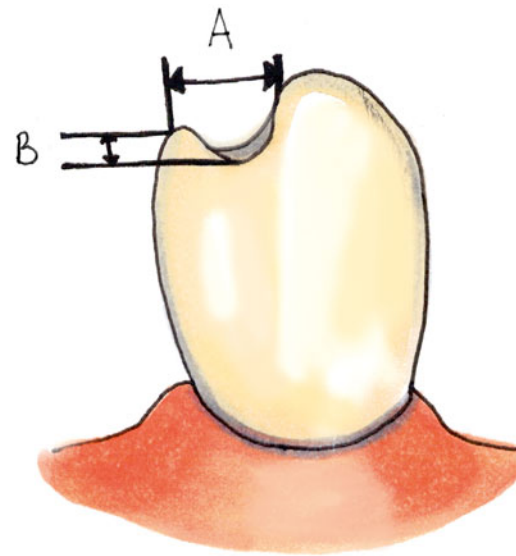

Fig. 10.9 "V"-shaped incisal rest seat dimensions should be approximately 2.5 mm mesiodistally (*A*) and 1.5 mm occlusogingivally (*B*)

fluoride substitutes and irreversible hydrocolloids may be incompatible.

When a metal-ceramic restoration with a rest seat has been fabricated, the rest seat should be on the metal surface and placed at least 1 mm away from the metal-ceramic junction. Although the fabrication of all-ceramic crowns for RPDs with rest seats and guide planes has been described in the literature, there are still no long-term studies. When placing rest on a large amalgam restoration, possible complications should be considered and patient's consent might be taken.

Fig. 10.10 In distal extension removable partial dentures, mesial rest is recommended. But a distal rest can be used in the presence of an abutment tooth being rotated or having large restoration and a heavy centric contact on the mesial

It has been shown that the pressure distribution under the distal extension base is affected by occlusal rest localization and the RPD design. *Rest localization* varies in different, partially edentulous cases. In Kennedy I and II cases, mesial rest is preferred (Fig. 10.10). But in some cases (such as when abutment teeth are rotated and have a large restoration or a heavy centric contact on the mesial), a distal rest in a suitable prepared rest seat can be used. Long guiding planes with distal rests should not be used to avoid potential torquing. In Kennedy III and IV cases, rests are placed adjacent to the edentulous space.

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