

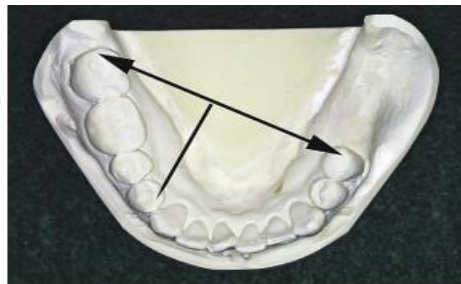
Indirect Retainers

Definition: A part of a removable partial denture that prevents rotational displacement of the denture about the rests of the principal abutment teeth. Indirect retainers usually take the form of rests, on the opposite side of a fulcrum line.



Vertical movements of distal extension bases can occur in two directions. Movement of a distal extension base toward the ridge tissues will be proportionate to the displaceability of those tissues, *the fit of the denture base and the load applied*.

Movement of a distal extension base away from the ridge tissues will occur by either *displacement of the entire denture (resisted by the direct retainers)*, or *a rotational movement about an axis*. This axis passes through rests of the most posterior abutment teeth and is called the *fulcrum line*. Most tooth borne partial dentures do not exhibit rotational movements, due to their extensive tooth support. However, any Class III or Class IV partial denture that has mobile abutments may exhibit rotational movements.



In addition to preventing movement of a distal extension base away from the tissues, an indirect retainer may serve the following auxiliary functions:

1. It tends to reduce **torqueing leverages** on the principle abutments.
2. Contact of the indirect retainer's minor connector with vertical tooth surface aids in stabilization against **horizontal movement** of the denture. Such tooth

surfaces, when made parallel to the path of placement, may also act as auxiliary guiding planes.

3. Anterior teeth with indirect retainers are supported against **lingual movement**.

4. Indirect retainers act as an auxiliary rests to support a portion of the major connector. For example, a lingual bar may be **supported against settling into the tissues** by an indirect retainer acting as an auxiliary rest.

The indirect retainer may take any one of several forms. All are effective proportional to their support and the distance from the fulcrum line that they are placed.

1. Auxiliary cingulum rests: The cuspid is the most easily utilized anterior tooth for preparation of a rest seat since the cingulum is usually more prominent than the lateral or central incisors.

2. Auxiliary occlusal rest: Usually placed on the mesial occlusal of a first bicuspid tooth when there is inadequate cingulum tooth structure on the canines or there is poor access to the lingual surfaces of the anterior teeth.

3. Continuous bar retainers and lingual plates: Technically, continuous bar retainers and lingual plates are not indirect retainers since they rest on unprepared lingual inclines of anterior teeth. The indirect retainers are actually the terminal rests at either end in the form of auxiliary occlusal rests or canine rests.



DENTURE BASES AND REPLACEMENT DENTURE TEETH

Functions

1. Support and retention of the denture teeth (hold teeth).
2. Transmission of stresses to oral tissues - maximal coverage within anatomic limitations, accurate reproduction of supporting tissues.
3. Improve esthetics.

Materials

1. Acrylic Resin Bases: Acrylic resin bases are the most common types used in removable partial dentures. They should be routinely used in distal extension cases to allow for **relining** of the base to maintain mucosal support. Acrylic resin should make a butt joint (or slightly undercut joint) with the major and minor connectors. If the resin is brought to a feather edge, it will distort, break or separate from the framework, causing injury to the underlying soft tissues.

Advantages:

- a. Ability to reline the base as the supporting tissues change.
- b. Esthetically superior to metal bases.
- c. Ease of repair.

Disadvantages:

- a. Dimensional stability less than metal bases – warpage.
- b. Lower strength than metal - long spans.
- c. Porous – hygiene.
- d. Low thermal conductivity.



2. Metal Bases: Metal bases can be used wherever acrylic resin bases are used. However, the esthetic result can be compromised unless the metal can be veneered with sufficient thickness of acrylic. If an insufficient veneer is used,

a greyish hue of the underlying metal becomes visible. Where single tooth replacements are placed, there is often insufficient room to fabricate a retentive gridwork. A full metal base is often used in these instances. When this type of base is used, denture teeth are attached to the framework with acrylic resin via beading or retentive posts on the metal surface. In some rare instances, a tooth-bounded edentulous span may exist that is too small for placement of a denture tooth. When this type of edentulous space is encountered, it can be completely filled with the framework metal, if it will not compromise esthetics. Metal bases cannot be relined, so they are generally **not used** for **tooth-tissue** borne removable partial dentures, or in areas where teeth have been removed within 12 months (**resorption** will still be occurring at an increased rate and relining will usually be required).



Advantages:

1. Thermal Conductivity - Thermal conductivity is thought to maintain tissue health by ensuring patients do not swallow substances that are too hot. Some patients feel that improved thermal perception lessens the feeling of the denture as a foreign object.
2. Accuracy and Permanence of Form - Metal alloys cast accurately and maintain their accuracy. The accuracy in casting can **eliminate the need for a posterior palatal seal**. In contrast, acrylic resins distort due to release of **internal strains** after processing. This causes them to distort away from palate in the posterior region, thereby **affecting retention**. In addition, acrylic resins can **imbibe or lose moisture** depending on their storage conditions, leading to distortion and/or warpage if they are improperly stored. **Abrasion from tooth brushing** can adversely affect **retention** of acrylic resin bases in extreme cases.
3. Hygiene - Metal surfaces are **less porous** than resin surfaces. This lessens

food, plaque and calculus accumulation, thereby maintaining healthy tissues.

4. Weight and Bulk - The metal bases can be cast **thinner** than resin bases while maintaining adequate strength. Thus, metal bases have **minimal weight and bulk**.

Flange Extension

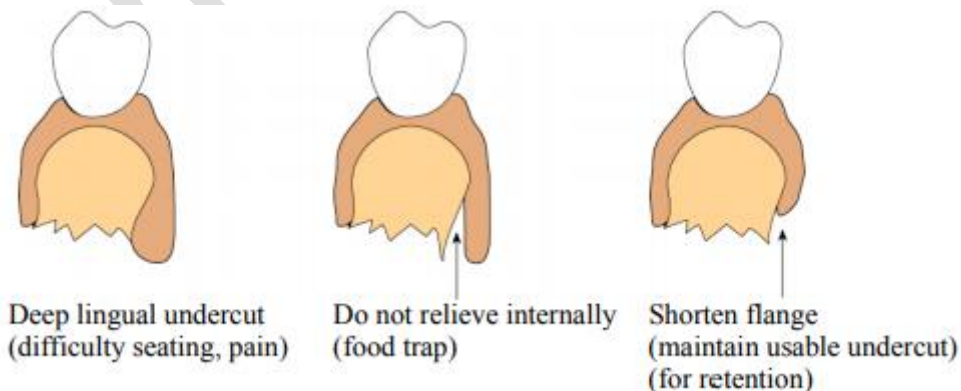
1. Denture bases for tooth-tissue supported partial dentures (Class I and II) should be extended to provide the greatest available surface area for **support and retention**, without overextension or impingement on movable border tissues.

2. Tooth supported partial dentures (Class III and IV) need not necessarily be extended maximally, since most of the support for these dentures comes from the teeth.

3. Maxillary distal extension denture bases should terminate in the hamular notches.

4. Mandibular distal extension denture bases should terminate on the pear-shaped retromolar pads.

5. Occasionally, the path of insertion can cause the denture flanges to impinge on the mucosa above undercut portions of the residual ridge, when the partial denture is being seated. In these instances, it is usually preferable to shorten the flange, rather than relieving the internal surface. If the internal surface is relieved significantly, a space will exist between the denture base and the tissues when the denture is fully seated. Food may become trapped in the space and work its way under the partial denture.



Acrylic Resin Finish Lines

Denture bases should have **internal and external finish lines** which do not coincide (offsetting improves the strength at the metal/denture base junction). Internal finish lines should be placed furthest from the abutment teeth.

Beading of the Maxillary Cast:

Beading is a term used to denote the scribing of a shallow groove on the maxillary master cast outlining the palatal major connector exclusive of rugae areas. The purposes of beading are as follows:

1. To transfer the major connector design to the investment (refractory) cast.
2. To provide a visible finishing line for the casting.
3. To ensure intimate tissue contact of the major connector with selected palatal tissue. Beading is readily accomplished by using an appropriate instrument, such as a cleoid carver. Care must be exercised to create a groove not in excess of 0.5 mm in width or depth



Partial Denture Replacement Teeth

Material

- Acrylic denture teeth should be used in most instances since they will not wear the opposing dentition to the same degree as porcelain teeth.
- Acrylic teeth are easier to arrange, modify and adjust.
- Porcelain denture teeth cause accelerated wear of the natural dentition, particularly once the surface glaze has been broken.

Tooth Form

The selected tooth form should be selected to harmonize with the **opposing teeth**. In almost all instances where the teeth will oppose a natural dentition, adjustment of the occlusal surfaces will be necessary to provide acceptable



occlusal contacts. Denture teeth should be selected to harmonize with the shade, shape, length and width of the remaining dentition. Appearance will be most compromised if there is a vast difference in tooth length between the replacement tooth and adjacent natural teeth. In order to improve esthetics, teeth adjacent to the abutment teeth may have to be modified to ensure the proximal plates and other framework components do not interfere with proper positioning of the denture teeth.

Occlusal Scheme

The occlusal scheme selected for a partial denture may vary from a fully balanced occlusal scheme when opposing a complete denture, to an anterior disclusion arrangement when a tooth borne partial opposes a natural dentition with all remaining natural anterior teeth. If the partial denture can be made with a scheme that does not require balance to ensure its stability, then a **nonbalanced scheme should be chosen**. As more of the occlusal table is involved in the prosthetic replacement teeth, the more a balanced occlusal scheme may be have benefit.