

PARTIAL DENTURE : 12 INTRA CORONAL ATTACHEMENTS AND INDIRECT RETAINERS

Attachment direct retainers:

Which could be either:

1. Intra coronal attachments.



As its name implies, an intracoronar direct retainer resides within the normal contours of an abutment and functions to retain and stabilize a removable partial denture.

It is a retainer consisting of a receptacle (matrix) and a closely fitting part (patrix). The matrix is usually contained within the normal or expanded contours of the crown of the abutment tooth and the patrix is attached to a pontic or a removable partial denture.

When two or more intracoronar attachments are used in a single removable partial denture, the precise parallelism of all matrix and patrix components is essential. Parallelism results in a well-defined path of insertion and removal and in mechanical binding when off-axis forces are applied to the prosthesis.

Advantages:

- Elimination of visible retentive components.
- Elimination of visible vertical support element through a rest seat.
- Provides some horizontal stabilization.
- Stimulation of underlying tissues due to intermittent vertical massage.

Disadvantages:

- Preparation of abutments and castings.
- Complicated clinical and lab procedures.

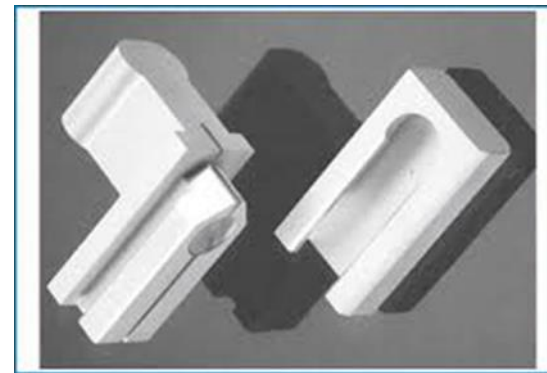
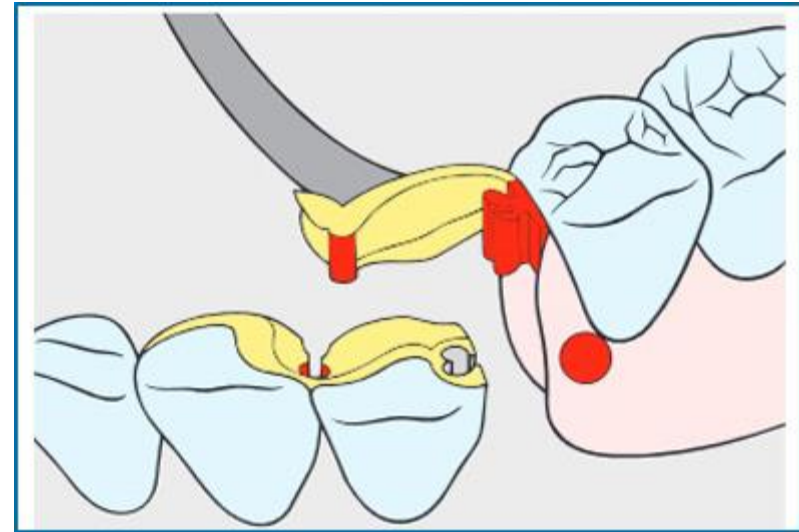
- Wear resulting in loss of frictional resistance.
- Difficult to repair and replace.
- Least effective in teeth with small crowns.
- Difficulty to place it completely within the circumference of the abutment tooth.

Contraindications:

- Large pulp (this limits the depth of the Receptacle).
- Short crowns offer lesser frictional resistance.
- Cost.

There are two major categories of attachments according to manufacturing:

precision attachments: those are manufactured with high precision manufacturing techniques that allow walls fitness with tolerance of about 10 microns, these are usually ready made parts.



semi precision attachments that are made by dental technicians as wax or plastic models that are later casted as part of the denture assembly.



2. Extracoronal attachments:

These attachments are more aesthetic, resilient and easy to insert. They are indicated for an anterior prosthesis in a young patient with a large pulp chamber.

Disadvantages:

- a.** Bulky attachment requires more space within the removable partial denture.
- b.** Weak and easily fractured.
- c.** Difficult to replace.

examples of extracoronal attachments may include:

- i. Stud Attachment: e.g. GERBER, DALLA BONA, and ROTHERMAN**



This attachment acts like a stress director. They are used for overdenture abutments.

Advantages:

- *More versatile*
- *Decreased leverage*
- *Can be used on malaligned abutments.*
- *Easy to adjust and repair.*

Disadvantages:

- *It has a tipping effect on the abutment teeth.*
- *Complex design.*
- *Cannot be used in cases with limited space.*
- *Expensive.*

ii. Bar Attachment: e.g. DOLDER, HADER

It is used when there is bone loss around the abutment teeth.



Advantages:

- *Rigid splinting*
- *Cross-arch stabilization*
- *It can be used along with other attachments or implants for a combined fixed-removable prosthesis.*

Disadvantages:

- Space requirement.
- Needs frequent soldering.
- Difficult to maintain oral hygiene.

Stress breakers

Distal extension partial dentures should be designed in a manner to prevent the damaging effect of the rigid connection between the denture base and the abutment teeth. This rigid connection is through the rigid major and minor connectors. The stress on the abutment teeth and residual ridge is minimized through tire use:

1. Denture bases constructed from functional impressions.

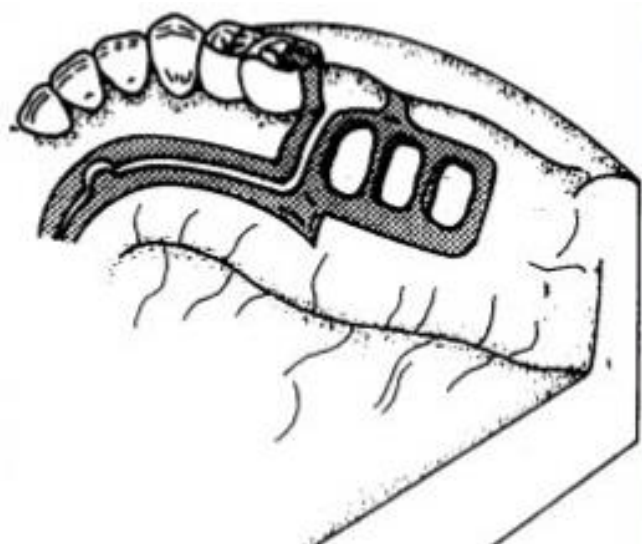
2. Broad coverage of the denture base.
3. Harmonious occlusion
4. Correct choice of the direct retainers.

A stress breaker is defined as, “A device which relieves the abutment teeth of all or part of the occlusal forces”

Types of stress breakers:

1. Types of clasp assemblies used for distal extensions because of their stress-breaking design (R.P.I., R.P.A. or tapered wrought wire retentive arm).
2. Stress breakers that separate the actions of the direct retainers from the movement of the denture base through independent movement of the denture base (or its supporting framework) and the direct retainers.

This form of stress-breaker is also referred to as a stress equalizer and an example is the split bar major connector, which is a commonly used stress breaker.



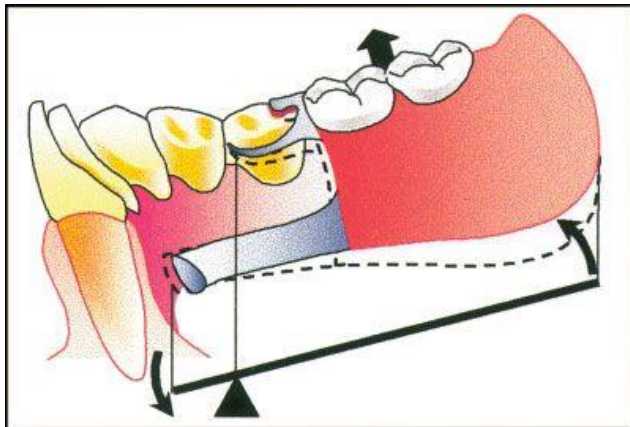
All stress-breakers effectively disperse damaging vertical stresses to the abutment teeth, which is the main purpose of their use. However, this is achieved with the following disadvantages:

1. Reduced horizontal stability
2. Excessive ridge resorption
3. Tissue impingement
4. Inefficient mastication

It is the rigid nature of the conventional removable partial denture that allows satisfaction of all requirements for support, stability, and retention without overemphasis on only one principle to the damage of the oral tissues.

Indirect retainer

Partial denture movement can exist in three planes; horizontal, frontal, and sagittal. **Tooth-supported partial dentures** use teeth to control movement away from the tissues. **Tooth-tissue-supported partial dentures** have at least one end of the prosthesis free to move away from the tissue. Thus, there is an axis or line about which the denture will rotate when the bases move away from the residual ridge and this is associated with tooth-tissue supported partial dentures. A **fulcrum line** is a theoretical line around which a removable dental prosthesis tends to rotate when subjected to forces towards or away from the residual ridge.



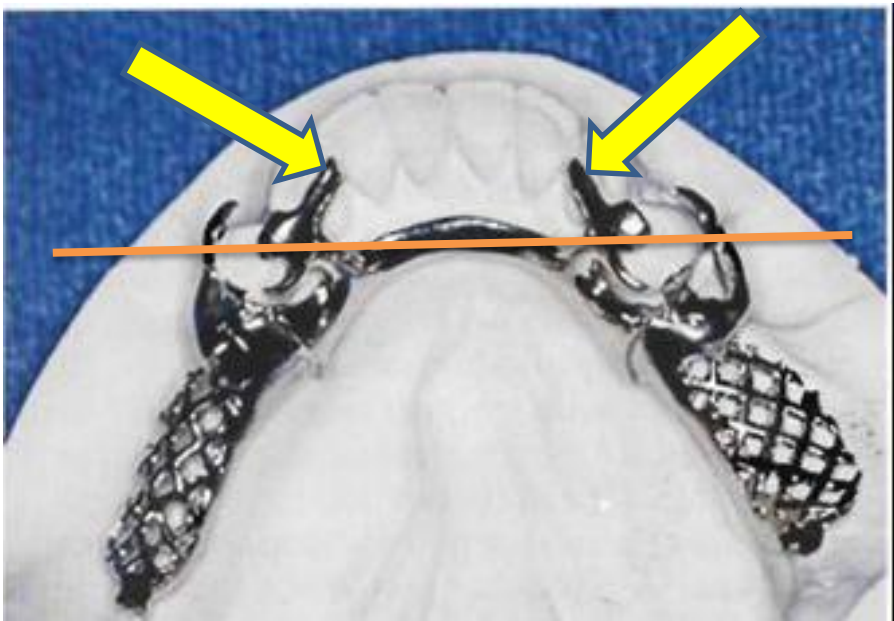
part of a removable partial denture which assists the direct retainers in preventing displacement of distal extension denture bases by functioning through lever action on the opposite side of the fulcrum line

This movement away from the residual ridge around the fulcrum line can be prevented by the

action of an indirect retainer. Thus, an **indirect retainer** is the component of a removable partial denture that assists the direct retainer in preventing displacement of the distal extension denture base by functioning through lever action on the opposite side of the fulcrum line when the denture base moves away from the tissues in pure rotation around the fulcrum line. Therefore, the **main function of the indirect retainer** is to prevent movement of a distal extension base away from the tissues.

An indirect retainer consists of one or more rests and the supporting minor connectors and should be

placed as far from the distal extension base as possible.



The most effective location of an indirect retainer is in the area of an incisor tooth, but this tooth may not be strong enough may have steep inclines that cannot support a rest. Thus, the nearest canine or the mesio-occlusal surface of the first premolar may be the best location for the indirect retention and on both sides of the arch closer to the fulcrum line are

used to compensate for the compromise in distance.

Types of indirect retainers

1. Auxiliary occlusal rest

- Most frequently used.
- It is located on the occlusal surface as far as possible away from the distal extension base.
- It is placed perpendicular to the midpoint of the fulcrum line. If this perpendicular ends on the incisal area it is avoided.

2. Canine extension from the occlusal rest.

3. Canine rest.

4. Continuous bar retainers and linguoplates.

5. Modification areas.

Consider a class II modification 1 case, in which the fulcrum line runs from the left second

premolar to the right second molar. Here, the supportive element of the direct retainer (rest) on the right first premolar can act as an indirect retainer because it is far enough from the axis of rotation.

6. Rugae support

- As the rugae area is firm and well placed, it can be used for indirect retention for a palatal horseshoe major connector. Also this horseshoe lacks adequate posterior retention. Hence, the rugae support is used as an indirect retainer.
- The tissue support derived from the rugae is less effective than a tooth supported indirect retainer.

7. Direct indirect retention

- Sometimes, the reciprocal arm of a direct retainer located anterior to the fulcrum line may also act as an indirect retainer.

8. Indirect retention from major connectors

- In the mandibular arch, retention from the denture base is enough to avoid the movements of the denture away from the tissues.
- In the maxillary arch, full palatal coverage is usually necessary for additional indirect retention especially when only anterior teeth are present.