

Precision attachment

The precision attachment partial should differ only in the means of its retention when compared to the clasp-retained partial denture. The only reason for utilizing this mechanical device is to replace the visible clasp arm. All other functions of the partial can be performed by conventional means if they are understood & the partial is constructed to the highest standards.

Attachments are rigid or resilient connectors that redirect the forces of occlusion. They are stress attenuators & absorbers. Their function is to protect & preserve soft tissue & bone, as well as provide retention & cosmetic alternatives.

Indication of the attachment are:

١. Fixed bridge work intra-coronal attachment on non-parallel abutments.
٢. Partial denture.
٣. Over-denture.
٤. Unilateral or bilateral free end denture.
٥. Implant prostheses.

Diagnostic procedures:

Space will almost always be a major consideration & a problem for precision attachment selection & use; therefore, a diagnostic wax-up & set up is essential for every case, regardless of what is found in the opposing arch, this diagnostic positioning of teeth on bases that will allow verification in the mouth must be done so that tooth position can be evaluated both by the clinician & the patient. The final position of all teeth & the denture base, must be known to ensure that the space requirements of the attachment system under considerations can be met.

The pick-up impression:

The clinician must develop a technique for making a final impression for the RPD framework that includes picking up the completed fixed components from the mouth in such a way that the position of the units remains accurately related to the remainder of the mouth, having the actual crowns on the master cast allows precise positioning of the attachment components, a task that may not be possible when working on a stone replica of the crown, due to the probable fracturing of thin projections of stone.

Classification of precision attachments:

There are many different types of prefabricated attachments available & they are usually classified on :

1) Basis of location or shape & form:

- A. Extra-coronal.
- B. Intra-coronal.
- C. Stud.
- D. Bar.

2) Based primarily on the function of the attachments:

- A. **Rigid:** any attachment employing a mechanical locking action with the use of clasps, lingual arms, springs, ball & sockets etc.
- B. **Passive:** an attachment that provides a free movement of the male when the abutment teeth are exposed to excessive forces.

1. Intracoronal Attachments

An intra-coronal attachment is one which is contained within the normal contours of the crown portion of a natural tooth. The placement of the attachment requires that the abutment tooth be restored with a full or partial coverage (3/4) crown. Intra-coronal attachments are made with a key (patrix) & key way (matrix) mechanism, the matrix fits within the contours of a crown & the patrix is a part of the RPD framework. The patrix engages the vertical walls built within the contours of the crown & resists dislodgement by a torsional resistance of the metal.

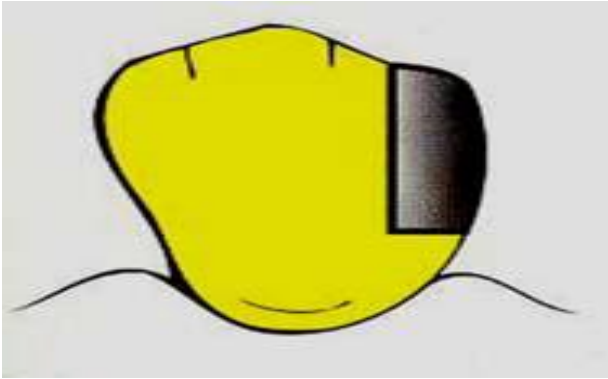
Advantages:

- 1. Improve aesthetic outcomes.
- 2. Improve leverage management.

3. It have a rigid connection that does not require indirect retainers.

Disadvantages:

1. It required extensive preparation of an abutment tooth in order to obtain space for the matrix mechanism.
2. Aggressive crown preparation make the younger individual with large pulp chamber is contra-indicated.



2. Extracoronal Attachment

Extracoronal attachments are positioned entirely outside the crown contour of the tooth. The advantages of this type of attachment are that the normal tooth contour can be maintained, minimal tooth reduction is necessary and the possibility of devitalizing the tooth is reduced.

This group of images shows the extracoronal attachment components and the aesthetics of the removable partial denture when viewed from the buccal aspect.

3. Stud attachments:

Most of the stud attachments are simple in design, consisting of a male stud type that is soldered to a base. The base is a coping covering the prepared tooth stump, usually having a post extending into an endodontically treated root canal.

A. **Extraradicular stud attachment** in which the male element projects from the root surface of the preparation or implant.

B. **Intraradicular stud attachment** in which the male element forms part of the denture base & engages a specially produced depression within the root contour or implant.

Radicular and intraradicular stud type attachments are connected to a root preparation. Some stud type attachments are directly cemented to the prepared root without requiring a cast coping. Stud type attachments may promote improved or easier oral hygiene and enhance the crown-root ratio due to the low profile. The image at the right shows such an attachment utilized with an implant.



Bar attachment:

The purpose of the bar attachment are splinting of the abutment teeth & retention & support of the prosthetic appliance. Bar attachment are of two types bar units & bar joints. Bar unit have rigid fixation where there is no movement between the bar & overlying sleeve & therefore can be classified as tooth borne. Bar unit permit rotational movement between sleeve & bar, utilizing more of the residual ridge for support.

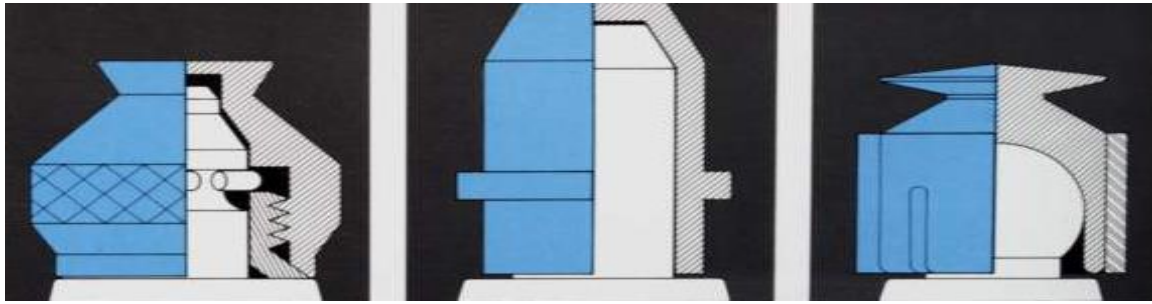
Hader Bar:

This bar can serve either as a bar joint or a bar unit or as stud .It consist of preformed plastic bars and clips .The plastic bar is attached to the coping wax-up and is casted with the coping. The plastic clips can be imbedded in the denture base to gain retention .

Retentive Attachments mechanism :


- 1. friction between the male and female components , active retention provided by springs that fit into recesses.
- ✓ The greater the number of attachments , the lower the retentiveness of each individual element.
- 2. magnetic anchor.
- 3. frictional & mechanical.


ξ. Suction is a force created by a vacuum that causes a solid object to adhere to a surface.



Magnets attachments:

A special type of concealed attachment not of male-female design. Some metal alloy possess magnetic properties which can be utilized in the retention of overdentures or partial dentures. Two different alloys are used as magnets in dentistry. These are cobalt-samarium & iron neodymium-boron. Both of these rare earth magnets, have strong attractive forces.

 **Advantages:** There is less need for parallel abutments as a rigid line of insertion is not critical, the technique is simple & involving minimal time at the chair side & in the laboratory.

 **Disadvantages:** Magnets are brittle materials with a low corrosion resistance. Even when encapsulated in stainless steel, titanium or palladium, the coating may wear & the magnetic alloy will come into contact with saliva. The combination of saliva contact & wear has a deleterious effect on the corrosion resistance of the material procedure. The magnets are placed on the replica of the keepers & cured within the denture base material. The overdenture abutments have a cast magnetic alloy post & coping which is placed in the root canal.