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Attachments

- An attachment is defined as a mechanical device used for retention and stabilization of a prosthesis.
it fall in two categories:

1. PRECISION ATTACHMENTS
   Ready made attachment their component are machined in a especial alloys under precise tolerance. Less wear, Standard parts, easier to repair.

2. SEMI- PRECISION ATTACHMENTS
   semi- precision attachment is fabricated by the direct casting of plastic, wax or refractory patterns, subject to variables of fabrication, economy.
- **Rigid attachments**: do not allow for movement of the denture base providing adequate retention. However, may induce more torque on the abutments.

- **Resilient attachments**: allow some controlled vertical movement. They induce less torque on abutments. However, they are more complex in design and fabrication.
it’s important to differentiate between resilient or non resilient type restoration. Abutment/tooth supported restorations are considered non-resilient or solid, while abutment and tissue-supported restorations are considered resilient.
Selection of Overdenture Attachments

- Available interarch space
- Cost
- Alignment of the roots
- Maintenance issue
- Clinical experience and personal preference
Attachment retained overdentures are more expensive and require more work and time for their construction.

They are indicated for patients exhibiting good oral hygiene and low caries index.

Abutment teeth should have good periodontal condition and adequate bone support that enable them to tolerate extra stresses that may be added by the attachment.
Attachments for Overdentures

Types

1. Stud attachments
2. Magnets
3. Bar attachments
Stud attachments:

- Consist of male stud that snugly fits a female housing.
- The stud is usually attached to the metal coping cemented over the prepared abutment, while the female housing is embedded in the fitting surface of the acrylic overdenture exactly opposite to the abutment.
Advantages of stud attachments

- Among the simplest of all attachments
- Have applications for both root & implant supported prosthesis
- Their retentive elements can be reactivated or replaced in the denture base.
Brewer & Morrow (1980), classified stud attachments into:

**Resilient Stud attachments**
* Designed so as to permit or provide for a “controlled” movement.
* They act as safety valve for any overload situations.

**Rigid stud attachments**
* Do not allow any movement
* Indicated when interocclusal space is limited & when no potential movement of the overdenture is required
Rigid stud attachments

Stud atts. Work best when they are Aligned with one another and the path of insertion of the denture
Resilient stud attachments
Three categories may be considered:

1-Location
2-Function
3-Retention
1-Location

Overdenture Attachments

- Intraradicular attachment.
- Extraradicular attachment.
- Bar attachment.
Intraradicular attachment

Metal and plastic sections (male) are incorporated within the root
Intraradicular attachment
Intraradicular attachment

Metal section (female) is incorporated within the root
Chee & Donavan (1993) classified stud attachments into:

**Intra-radicular**

* The male portion (patrix) forms part of the denture base and engages a special depression within the root contour or implant
  * Logic
  * Zest

**Extra-radicular**

* The male portion (patrix) projects from the root surface of the preparation or implant
  * Rotherman attachment
  * Micro Fix
  * Dalla Bona
Extraradicular attachment
Attachments for Overdentures

Types

1. Stud attachments
2. Magnets
3. Bar attachments
Magnetic retention for overdenture:

One magnet pole is cemented in a prepared cavity in the endodontically prepared tooth, while the other pole is attached to the denture base opposite to it.
Magnets
it’s important to differentiate between resilient or non resilient type restoration. Abutment/tooth supported restorations are considered non-resilient or solid, while abutment and tissue-supported restorations are considered resilient.
3- Retention of attachments

It can be obtained by:

- frictional.
- mechanical.
- frictional and mechanical.
- Magnets.
Another distinction is made between mechanical and magnetic attachments. The difference lies in the mechanism of retention as the nomenclature implies.
Attachments for Overdentures

Types

1. Stud attachments
2. Magnets
3. Bar attachments
● **Bar attachments:**

A bar attachment is in the form of a bar contoured to run parallel and overlie the residual ridge connecting the abutments together.

The bar provides *support* and *retention* for the overdenture and *splinting of abutment teeth.* (or implants)
Bar attachment

Bar

Sleeve

Clip, into which the bar will slot
• Should not cause food entrapment
• Should not cause Blanching of the tissues
• Should not cause encourage tissue proliferation
Dolder bar
Single sleeve bar

Gilmore bar
Multi-sleeve system

Master cast to show position and alignment of bar
Bar attachment

- Retention tags project in the long axis of the bar, has been found to be somewhat more fracture resistant.
  - The buccolingual tags resist rotational force more than tagging parallel with the bar.
- Tagging encroaches arrangement of artificial teeth.
Bar attachments are either in the form of:

- **Bar units**: rigid fixation where there is no movement between bar and overlying sleeve “Tooth borne”

- **Bar joints**: Permit rotational movement between sleeve and bar, utilizing some of the residual ridge for support “tooth tissue borne”.
** Requirements of Bar Attachments **

** Adequate interocclusal distance **

** Adequate Bony support **

** Adequate clearance beneath the bar **

** Bar should follow ridge contour **
Classification of Bar Attachments

Bar Joints
- Resilient version
- Some rotational movement between the bar & the sleeve
- More R.R support
- Less torque on teeth

Dolder bar attachment

Bar Units
- Rigid version
- Provides rigid fixation – no movement between the bar & the sleeve
- Indicated when saddle gap is long

Resilient
- Resilient Dolder Bar

Rigid
- Solid Dolder Bar
Implant overdenture
Treatment Planning

- **Patient Selection**
  - Medical History.
  - Oral Hygiene.
  - Compliance.
  - Motivation.

- **Abutment selection.**
  - Position.
  - Number of abutments
  - Periodontal evaluation.
  - Endodontic evaluation.
  - Decay or previous restorations.

- **Inter-arch space.**
Choices of Overdenture Abutment

1. Amalgam plug
2. Cast dowel dome
3. Attachment on the abutment root

Factors to be considered

1. Cost
2. Abutment condition
3. Does the patient have high risk to caries?
4. Do we need extra retention to compensate the loss of peripheral seal from ridge/soft tissue undercut
Attachment selection:
it based on:

A- crown root ratio.
B- type of coping.
C- vertical space available.
D- number of teeth present.
E- amount of tooth support.
F- location of abutments.
G- location of the strongest abutments.

H- whether the overdenture is to be a tooth-supported or tooth-tissue supported.

J- type of the opposing dentition whether complete denture, overdenture, fixed appliances or natural dentition.

K- the maintenance problems and of least importance the cost.
Clinical Procedures

I- Abutment preparation:

- Crown reduction and contouring with or without endodontic treatment
- Periodontal treatment.

II- Primary impression:

alginate impression in stock tray.

III- Special trays constructed on primary cast.
Prepping the Abutments

Crown reduction

1. Maximum Reduction of the Coronal Portion
2. Crown-root ratio
3. No interference with artificial tooth placement
4. Restoration and polishing
Clinical Procedures

III- Secondary impression

Made using rubber base → stone
Clinical Procedures

- Secondary impression is made using rubber base, pour stone casts
- Wax patterns for copings
- Casting into metal
- Copings are cemented on prepared abutments
- Another Impressions are made to obtain casts for the coping-covered abutments.
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Upper special tray which is spaced for an alginate impression technique.
Another Impressions are made to obtain casts for the coping covered abutments

If precision attachments are used. A special tray is used with either impression paste or elastomers depending on the presence of undercuts. The tray has a window over each of the abutments, this ensures any excess material flows out, without displacing any of the tissues.
Clinical Procedures

IV- Jaw Relation Records:
Mounting of upper cast on semi ad. art. by face-bow record → mounting of lower cast by centric occluding relation → setting up of teeth.
Clinical Procedures

V- Try-in:

- Fitting surface of the trial denture should be relieved over the abutments for proper denture settling
- check for stability
- check vertical dimension
- check occlusion.
Clinical Procedures

VI- Denture processing
VII- Denture insertion
VIII- Post-insertion care
“Passive” Contact

- Abutment contacts denture in function only
- Fitting surface of the trial denture should be relieved over the abutments for proper denture settling, avoid pressure on the gingival margin of the abutments
Oral hygiene maintenance
Maintenance

- Oral Hygiene
  - 😊 Brushing
  - 😊 Denture kept in tap water when not use.

- Frequent recalls
  For post insertion care and prophylactic care of abutments. *(fluoride application)*
Provision of some sort of attachment mechanism on a cast coping.

Intracoronal or extracoronal.

Resilient or nonresilient designs.

Indicated in fixed bridge rest. and RPDs.
Intracoronal attachments
Extracoronal attachment
Extracoronal attachment
Extracoronal attachment act as Stress Breakers

RPD having a movable joint between the direct retainer and the denture base

This joint may be in the form of hinges, ball and socket devices or sleeves and cylinders

Hinged type stress breakers allows vertical and hinge movement of the base
Hinged type stress breakers allows vertical and hinge movement of the base to prevent direct transmission of tipping forces to the abutment.