Sri Aurobindo College of Dentistry

Indore, Madhya Pradesh

INDIA

MODULE PLAN

TOPIC : DIRECT RETAINER

SUBJECT:PROSTHODONTICS

TARGET GROUP: UNDERGRADUATE DENTISTRY

MODE: POWERPOINT – WEBINAR

PLATFORM: INSTITUTIONAL LMS

PRESENTER: DR.ANUP VYAS

CONTENT

- ✓Introduction
- ✓Definition
- ✓Role in Control of Prosthesis Movement
- ✓Basic Principle of Clasp Design
- ✓Types of Direct Retainers
- ✓Criteria for Selecting a given Clasp Design
- ✓Types of Clasp Assembly

DEFINITION

“That component of a partial removable dental prosthesis used to retain and prevent dislodgment, consisting of a clasp assembly or precision attachment.”- GPT-8

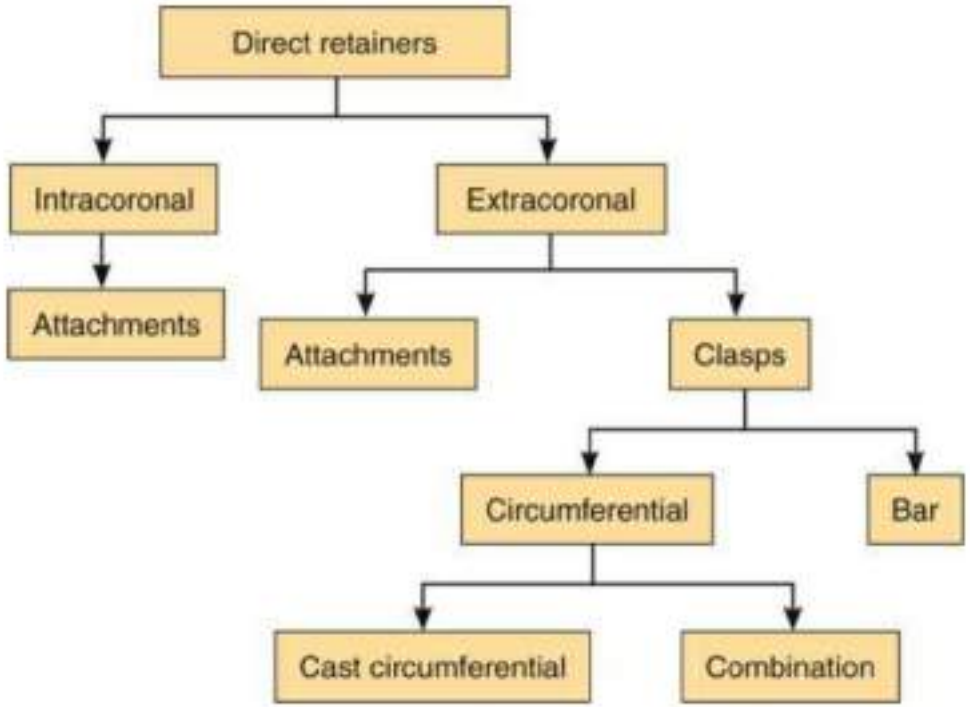
ROLE IN CONTROL OF PROSTHESIS MOVEMENT

This component engages the abutment tooth and prevents dislodgement of the denture away from the tooth/tissue or provides retention.

Resist movement of prosthesis away from the basal seat tissue.

CLASSIFICATION

Depending on their placement inside (within) the abutment tooth or outside (surrounding) the abutment

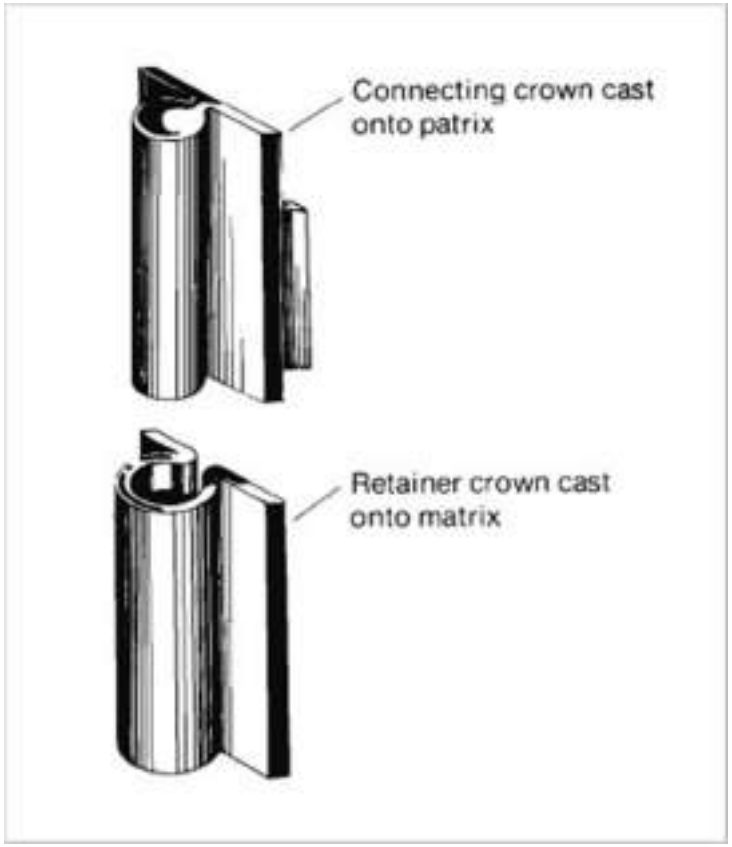


INTRACORONAL DIRECT RETAINER

These provide retention through components **placed inside (within) the normal contour of the abutment tooth**.

DEFINITION

A retainer consisting of a metal receptacle (matrix) and a closely fitting part (patrix); the matrix is usually contained within the normal or expanded contours of the crown on the abutment tooth/dental implant and the patrix is attached to a pontic or the removable dental prosthesis framework, precision attachment or internal attachment (GPT8)



INTRACORONAL DIRECT RETAINER

INTRACORONAL ATTACHMENTS

Any prefabricated attachment for support and retention of a removable dental prosthesis. The male and female components are positioned within the normal contour of the abutment tooth (GPT8).

These are prefabricated (manufactured) attachments positioned within the normal contour of the abutment tooth.

These are also called **'internal attachments'** or **'precision attachments'.**

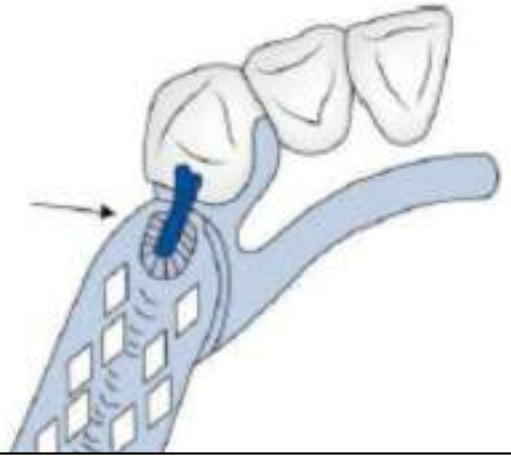
These were developed by **Dr Herman E.S. Chayes** in 1906.

INTRACORONAL DIRECT RETAINER

Intracoronal attachment consists of a male and female component. The **female part, also called 'matrix',** is a receptacle placed in the abutment tooth, while the male part (patrix) is an insert which is processed into the denture.

The precise fitting of the patrix into the matrix creates frictional resistance to removal which contributes to retention of the prosthesis

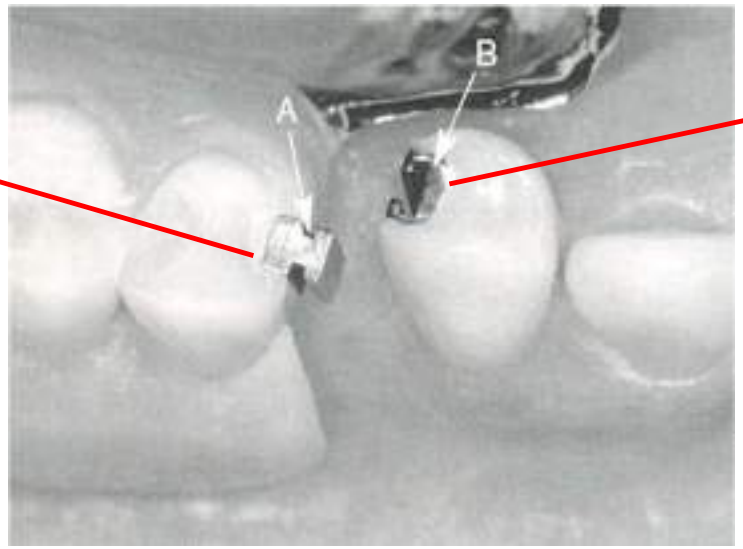
MATRIX PART WITHIN ABUTMENT



PATRIX PART WITHIN DENTURE

INTRACORONAL DIRECT RETAINER

PATRIX



MATRIX

INTRACORONAL DIRECT RETAINER

Two types of intra coronal attachments are available:-

Friction retained

Mechanical-lock retained

INTRACORONAL DIRECT RETAINER

ADVANTAGE

1. Elimination of visible retentive component.
2. Elimination of visible vertical support (rest seat).
3. Provide some horizontal stabilization, but additional stabilization is desirable.
4. Greater stimulation to underlying tissues because of intermittent vertical massage.

DISADVANTAGE

1. Require preparation of abutment tooth and castings.
2. Complicated clinical and lab procedures.
3. Loss of retention due to wear.
4. Repair and replacement is difficult.
5. Difficult to place completely within the tooth.
6. Cost.

INTRACORONAL DIRECT RETAINER

DISADVANTAGE

1. **Presence of large pulp –** related to age, placement may cause pulp exposure.
2. **Short or abraded teeth –** as they are prefabricated, length may be insufficient.
3. **Distal extension bases –** as they do not permit horizontal movement, all tipping and rotational forces are transmitted directly to abutment teeth. They require a ‘stress-breaker’ to transfer some forces to the residual ridge which also has its own limitations.

EXTRACORONAL DIRECT RETAINER

- They serve to retain and stabilize removable partial dentures when dislodging forces are encountered.
- These provide retention through components placed outside the normal contour of the abutment tooth.
- These are so named because a part or all of their mechanism lie outside the tooth contour.
- Extracoronal direct retainers may be divided into two distinct subcategories:
  - *EXTRACORONAL ATTACHMENTS*
  - *RETENTIVE CLASP ASSEMBLIES.*

EXTRACORONAL DIRECT RETAINER

Extracoronal attachment

- First proposed by Henry H Boos 1900 later modified by Ewing F Roach in 1908.
- Located outside the teeth.
- It derives their retention from closely fitting components termed matrices and patrices.
- Permit vertical movement during occlusal loading,minimize potentially damaging forces to abutment. This concept has led to “stress breaking” or “stress directing” theories of removable partial denture design.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

- It first appeared in the dental literature with Dr W. G. A. Bonwill's description in 1899.
- The retentive element of an individual clasp assembly is a metal clasp arm that displays a limited amount of flexibility.
- A clasp terminus *designed to contact the abutment surface apical to the height of contour* will resist displacement in an occlusal direction.
- Resistance to displacement is encountered because the clasp arm must undergo "deflection" or "bending" to pass over the height of contour

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

- Therefore, retention of the removable partial denture is determined, in part, by the location of the clasp terminus relative to the height of contour.

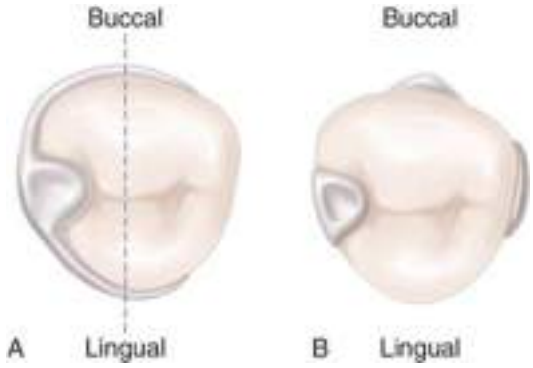
- The chosen path of insertion and removal will always define the height of contour and the associated areas of undercut.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Basic Principles of Clasp Design

1. Basic principle of clasp design, referred to as the *principle of encirclement,* means that more than 180 degrees in the greatest circumference of the tooth, passing from diverging axial surfaces to converging axial surfaces, must be engaged by the clasp assembly



a) Line drawn through the illustration represents 180 degrees of greatest circumference of abutment from the occlusal rest.
b)Bar-type clasp assembly engagement of more than 180 degrees of circumference of the abutment is realized by the minor connector for the occlusal rest, the minor connector contacting the guiding plane on the distal proximal surface, and the retentive bar arm.

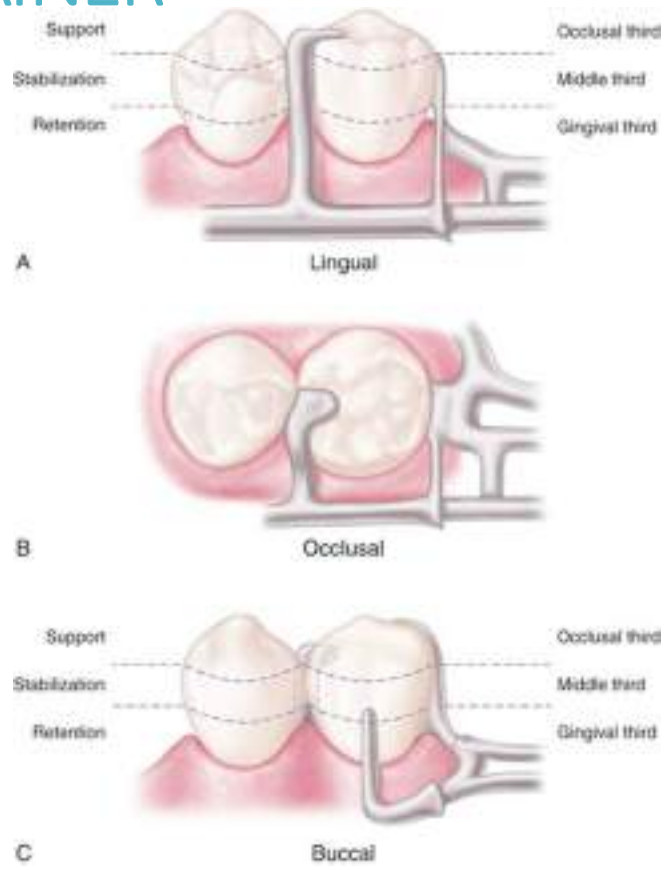
EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Terminology and their definition

Clasp assembly: The part of a removable dental prosthesis that acts as a direct retainer and/or stabilizer for a prosthesis by partially encompassing or contacting an abutment tooth-usage. Components of the clasp assembly include

1. the clasp
2. the reciprocal clasp
3. the cingulum
4. incisal or occlusal rest
5. the minor connector.



EXTRACORONAL DIRECT RETAINER

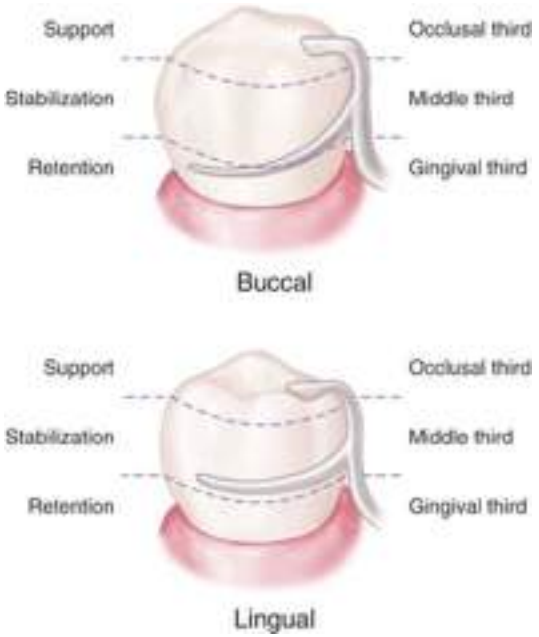
Retentive clasp assemblies

Terminology and their definition

Clasp: The component of the clasp assembly that engages a portion of the tooth surface and either enters an undercut for retention or remains entirely above the height of contour to act as a reciprocating element. Generally, it is used to stabilize and retain a removable dental prosthesis.

Undercut: The portion of the surface of an object that is below the height of contour in relationship to the path of placement.

Height of contour: A line encircling a tooth and designating its greatest circumference at a selected axial position determined by a dental surveyor; a line encircling a body designating its greatest circumference in a specified plane.



EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Characteristics

1. Operates on the principle of ‘resistance of metal to deformation’ by engaging an undercut (infrabulge) area of the abutment at a given path of insertion and removal for the prosthesis.

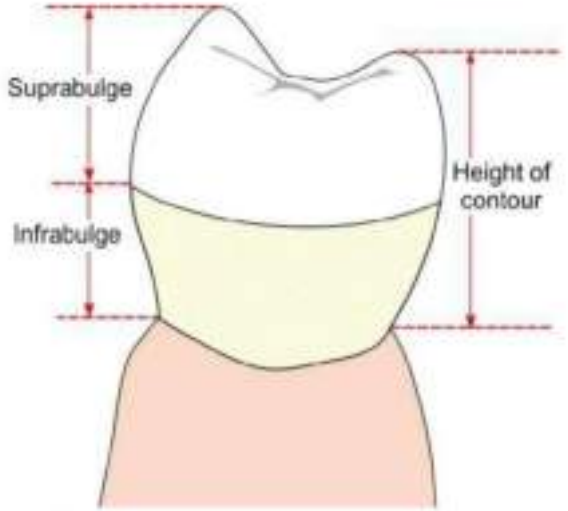


FIGURE 21.58 Principle of clasp retention.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Characteristics

2. Dislodging forces like sticky foods or force of gravity act perpendicular to the plane of occlusion. An undercut must be present in this position for the clasp to engage and resist dislodgement

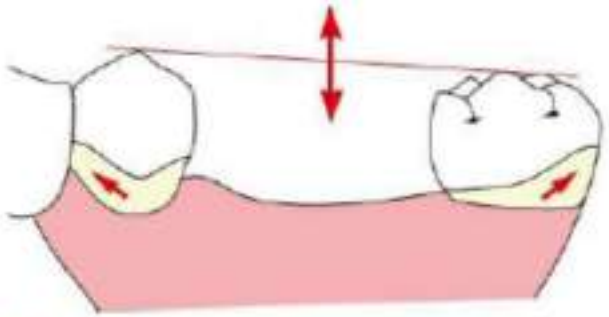


FIGURE 21.59 Dislodging forces like sticky foods or force of gravity act perpendicular to the plane of occlusion. An undercut must be present in this position for the clasp to engage and resist dislodgement.

EXTRACORONAL DIRECT RETAINER

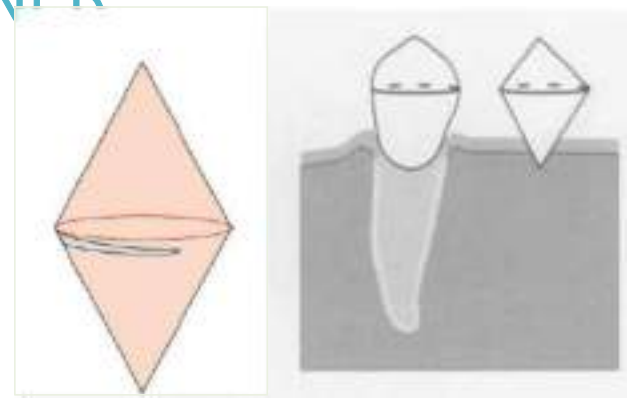
Retentive clasp assemblies

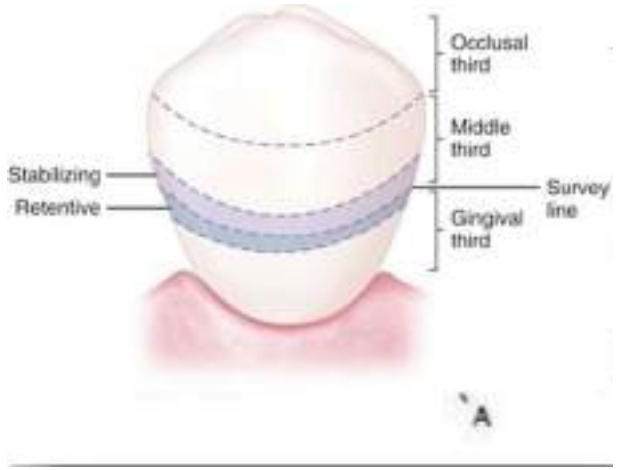
Characteristics

3. The basis of clasp retention originated from '**PROTHERO CONE THEORY'** in 1916.

- He described the crown shape of posterior teeth to be like two cones sharing a common base.
- The part of the clasp that **ends on the cervical cone** would **resist movement in an occlusal direction** as it would be forced to deform to come out of the undercut.

- The degree of resistance to deformation determines the clasp retention.





EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Characteristics

4. The line at which the two cones meet is called height of contour – coined by Kennedy. The height of contour will change if the vertical position of the tooth changes, similar to tipping or tilting a cast.

5. Devan (1955) referred to the surface occlusal to the height of contour as *suprabulge* area, and the surface below as *infrabulge.*

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Clasps can be of two types:

i. Circumferential or Akers' clasp – approaches an undercut occlusally

   a) *Cast circumferential clasp – all components are made up of cast alloy.*

   b) *Combination clasp – retentive arm only is made of wrought alloy, rest of the clasp is made of cast alloy.*

FIGURE 21.61A, B Circumferential clasp.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

ii. Vertical projection or bar or roach clasps – approach the undercut gingivally

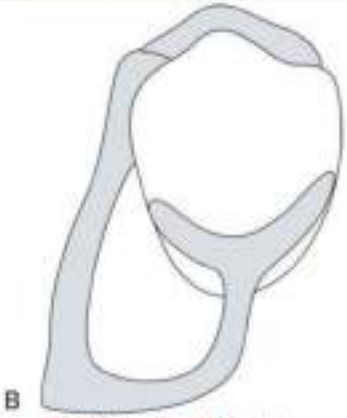


FIGURE 21.62A, B Bar clasp.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

The basic parts of a clasp assembly :

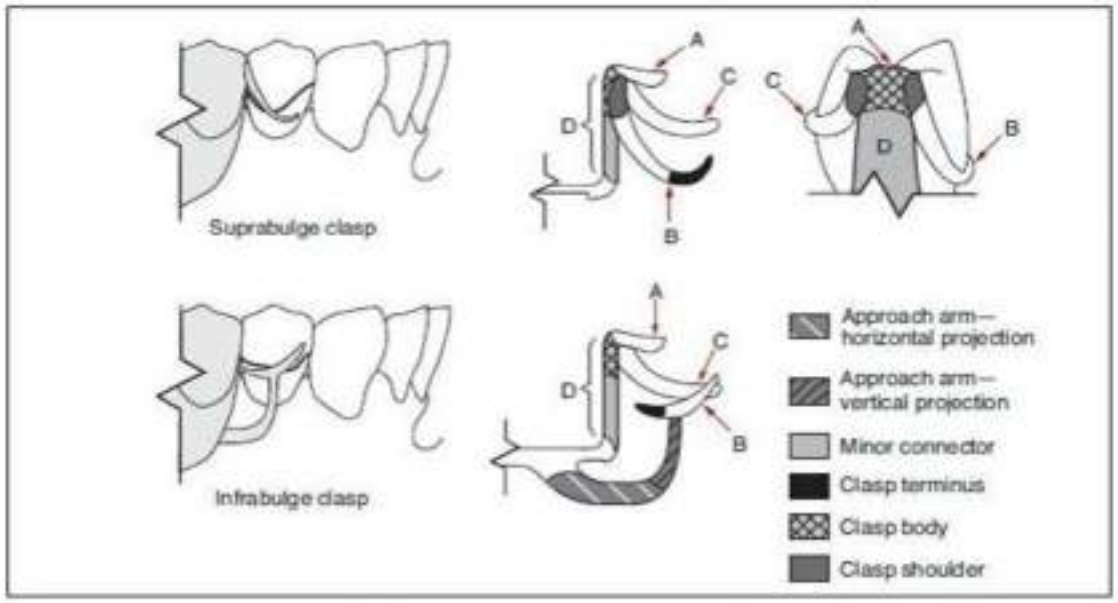


Fig 3-16 A properly constructed suprabulge or infrabulge clasp assembly must incorporate the following components: a rest (A), a retentive clasp (B), a reciprocal element (C), and one or more minor connectors (D). Specific design features of the various components include vertical and horizontal approach arms, clasp termini, clasp bodies, and clasp shoulders.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

The basic parts of a clasp assembly :

- Rest : It is the part of the clasp that lies on the occlusal, lingual or incisal surface of a tooth and resist tissue ward movement of the clasp.

- Body of the clasp : It is the part of the clasp that connects the rest and shoulder of the clasp to the minor connector. It must be rigid and above the height of contour.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

The basic parts of a clasp assembly :

- Shoulder: It is the part of the clasp that connects the body to the clasp terminals. It must lie above the height of contour and provide some stabilization against horizontal displacement of the prosthesis.

- Reciprocal arm: A rigid clasp arm placed above the height of contour on the side of the tooth, opposing the retentive clasp arm.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

The basic parts of a clasp assembly :

- Retentive arm : It is the part of the clasp comprising the shoulder which is not flexible and is located above the height of the contour.

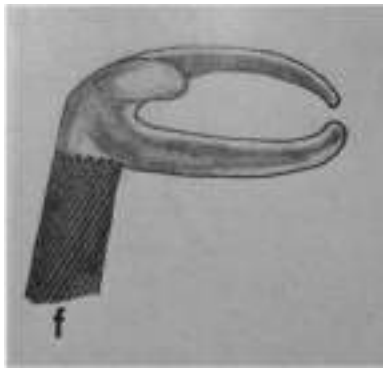
- Retentive terminal: It is the terminal end of the retentive clasp arm. It is the only component of the removable partial denture that lies on the tooth surface cervical to the height of the contour. It possesses a certain degree of flexibility and offers the property of direct retention.

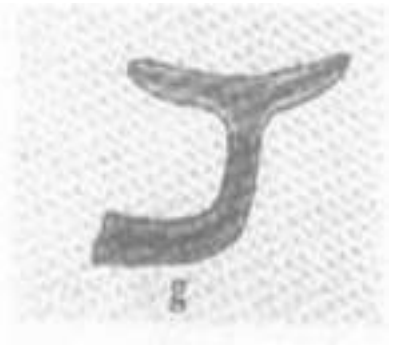
EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

The basic parts of a clasp assembly :

- **Minor connector :** It is the part of the clasp that joins the body of the clasp to the remainder of the framework and must be rigid.
- **Approach arm** : It is a component of the bar clasp. It is a minor connector that projects from the framework, runs along the mucosa and turns to cross the gingival margin of the abutment tooth to approach the undercut from a gingival direction.





EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

1. Retention
2. Support
3. Stability
4. Reciprocation
5. Encirclement
6. Passivity

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

1. Retention

Retention is the quality of the clasp assembly that resists forces acting to dislodge components away from the supporting tissues. It is not only the direct retainer which makes a RPD retentive but the effective design and its accurate construction.

1. Only the retentive terminus should engage the prescribed undercut.
2. The accompanying rest must provide support so the clasp terminus is maintained in an optimal location.
3. The minor connector must be sufficiently rigid to ensure proper stability.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

1. Retention

4.The reciprocal element must contact the abutment slightly before the retentive element contacts the tooth, and it must maintain contact until the prosthesis is fully seated to protect the abutment from potentially destructive lateral forces.

5.Components must provide sufficient encirclement to prevent movement of the abutment away from the associated clasp assembly, otherwise retention will be lost.

6.Indirect retainers must resist forces acting to dislodge the prosthesis from its fully seated position

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

1. Retention

Factors affecting the amount of retention provided by a clasp assembly :

- Type of clasp used
- Flexibility of the retentive arm
- Location of the retentive terminal in the prescribed undercut

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

2. Support

- Stability is the quality of a clasp assembly that resists displacement of a prosthesis in a horizontal direction.
- All framework components that are rigid and contact vertically oriented hard and soft tissues may contribute to the stability of a prosthesis.
- Components such as reciprocal element, rigid portion of retentive clasp arm, minor connectors and guide plates contribute to bracing.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

3. Stability

- Stability is the quality of a clasp assembly that resists displacement of a prosthesis in a horizontal direction.
- All framework components that are rigid and contact vertically oriented hard and soft tissues may contribute to the stability of a prosthesis.
- Components such as reciprocal element, rigid portion of retentive clasp arm, minor connectors and guide plates contribute to bracing.

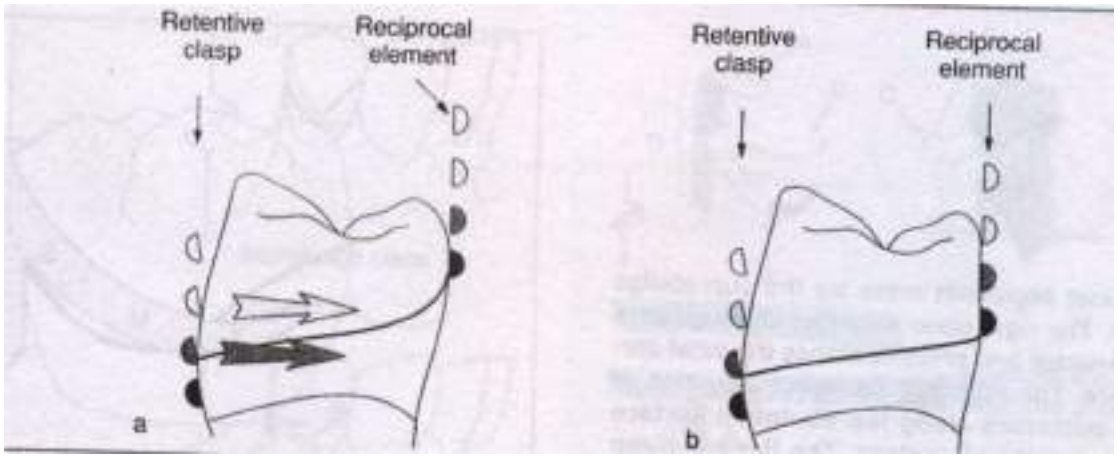
EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

4. Reciprocation

Reciprocation is the quality of a clasp assembly that counteracts lateral displacement of an abutment when the retentive clasp terminus passes over the height of contour. This component is known as a reciprocal element.



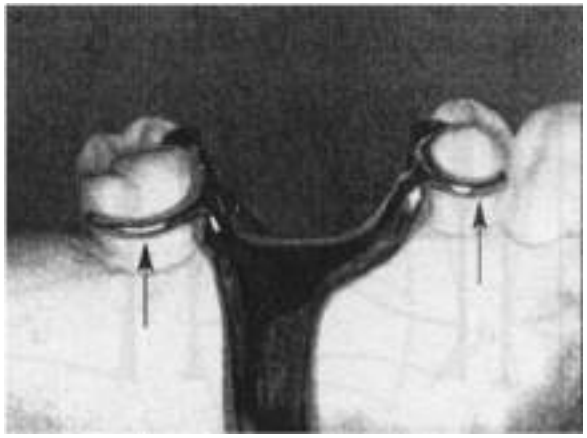
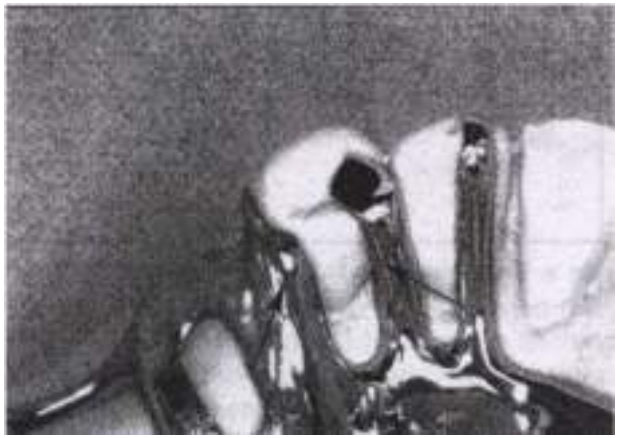
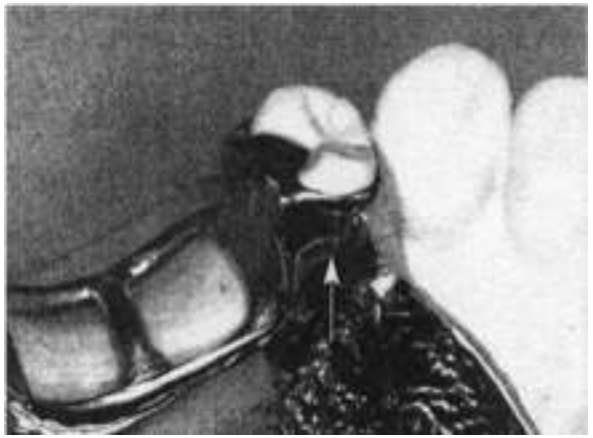
EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

4. Reciprocation

The reciprocal element may be a cast clasp, lingual plating, or a combination of mesial and distal minor connectors.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

5. Encirclement

- Encirclement is the characteristic of a clasp assembly that prevents movement of an abutment away from the associated clasp assembly.
- Each clasp assembly must be designed to provide direct contact over at least 180 degrees of the tooth's circumference.

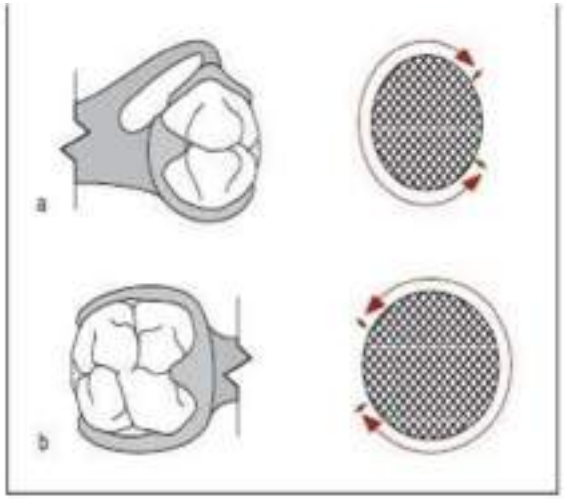


Fig 3-36 Both the infrabulge *(a)* and suprabulge *(b)* clasp assemblies have been designed to provide encirclement. Direct contact over at least 180 degrees of the abutment's circumference prevents movement of the tooth away from the clasp assembly.

EXTRACORONAL DIRECT RETAINER

Retentive clasp assemblies

Requirements of a Clasp Assembly

6. Passivity

- A clasp assembly should be passive when fully seated. The retentive arm should be activated only when dislodging forces are applied to RPD.

- If the clasp assembly is not fully seated, the retentive terminus will not be positioned in its intended location. As a result, the clasp assembly will apply non-axial (ie, lateral) forces to the abutment.

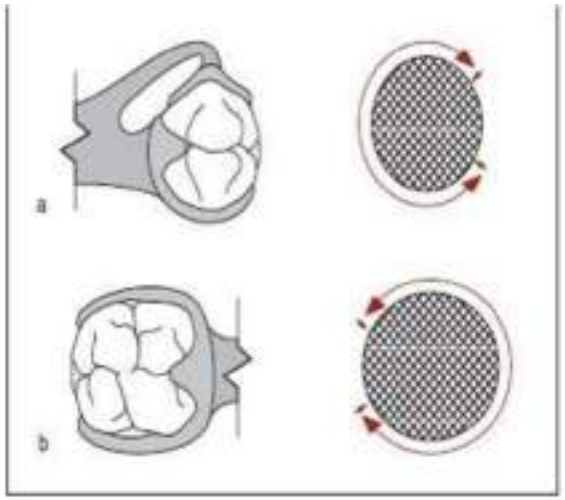


Fig 3-36 Both the infrabulge *(a)* and suprabulge *(b)* clasp assemblies have been designed to provide encirclement. Direct contact over at least 180 degrees of the abutment's circumference prevents movement of the tooth away from the clasp assembly.

TYPES OF CLASP

1. Circumferential clasp
   - A. CAST CIRCUMFERENTIAL CLASP
     - *i. Simple circlet clasp*
     - *ii. Reverse circlet clasp*
     - *iii. Multiple circlet clasp*
     - *iv. Embrasure clasp or modified crib clasp*
     - *v. Ring clasp*
     - *vi. Back action clasp*
     - *vii. Fish hook or hairpin clasp*
     - *viii. Onlay clasp*
     - *ix. Half and half clasp*
   - B. COMBINATION CLASP
2. Bar Clasp
   - i. T-clasp
   - ii. 2. Modified T-clasp
   - iii. 3. Y-clasp
   - iv. 4. I-Clasp

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

1. Suprabulge or Cast circumferential or Akers clasp

Introduced by Dr.N.B.Nesbitt in 1916.

Design :

The clasp approaches undercut from edentulous area and engages undercut opposite to edentulous space.

Indication :

Tooth supported partial denture.

Contraindication :

They cannot be used for distal extension cases as they engage the mesiobuccal undercut

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

1. Suprabulge or Cast circumferential or Akers clasp

Advantages

- Simplicity of design
- Easy construction
- Provides excellent support, bracing and retentive properties
- Close adaptation to tooth surface so no food entrapment.

Disadvantages

- Large amount of tooth covered, so underlying enamel prone to decalcification.
- The display of metal.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

1. Suprabulge or Cast circumferential or Akers clasp

Design Rules:

✓The clasp should arise from the main body of the clasp assembly above the height of contour.
✓All the components of the C clasp should be present above the height of contour except the retentive tip.
✓ The retentive terminus should always be directed towards the occlusal surface never towards the gingiva.
✓It should always terminate at the mesial or distal line angle never at midfacial or midlingual surface.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

2. Simple Circlet

- The simple circlet clasp design is versatile and widely used.
- **Indication**: Tooth-supported removable partial dentures.

Fig 3-46 Simple circlet cast circumferential retentive clasps are present on facial surfaces of both the first premolar and second molar abutments.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

2. Simple Circlet

Advantages:

1. Fulfills the design requirements.
2. Easy to construct
3. Simple to repair.

Disadvantages:

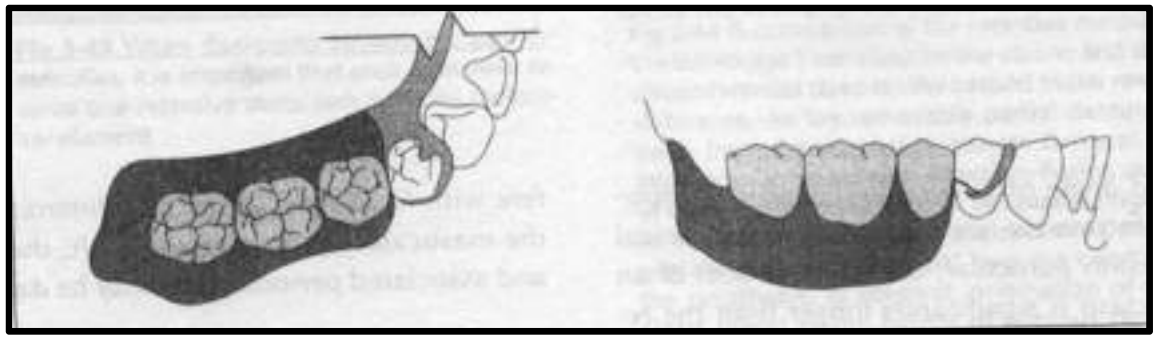
1. Adjustment is difficult.
2. The clasp assembly tends to increase the circumference of the clinical crown which may interfere with the elimination of food from the occlusal table and may deprive the adjacent gingival tissues of essential physiologic stimulation.
3. Increased tooth coverage may promote decalcification and compromise dental esthetics.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

2. Reverse Circlet

- Used when undercut is located at the facial or lingual line angle adjacent to an edentulous space.
- Design : It consists of a mesial occlusal rest, a horizontal reciprocal arm, and a retentive arm engaging the distobuccal undercut adjacent to the edentulous area.



TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

2. Reverse Circlet

Disadvantages:-

- Weak clasp if sufficient preparation is not done.
- Poor aesthetics if used in premolars and cuspids.

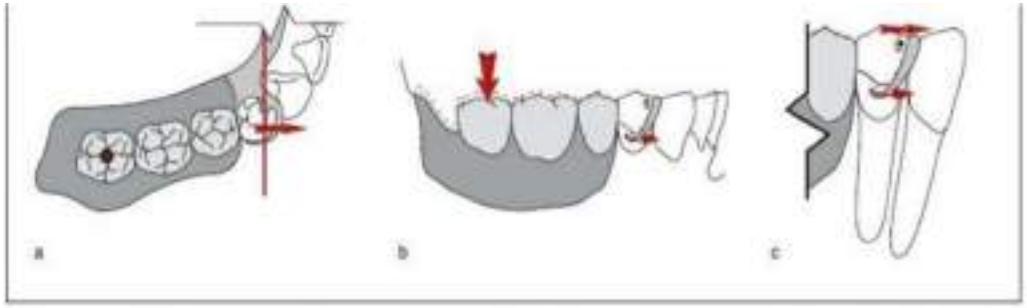


Fig 4-30 *(a)* The reverse circlet clasp arm direct retainer engages a distofacial undercut in a Class I partially edentulous arch. *(b)* Occlusal loading of the extension base results in prosthesis rotation around a mesial rest seat. *(c)* As an occlusal load is applied to the denture base, the terminal one third of the clasp arm engages the abutment's mesiodistal height of contour. This imparts a mesially directed force on the abutment that is well tolerated if sound proximal contact with an adjacent natural tooth is present.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

3. Multiple Circlet

- A multiple circlet clasp design involves two simple circlet clasps joined at the terminal aspects of their reciprocal elements.

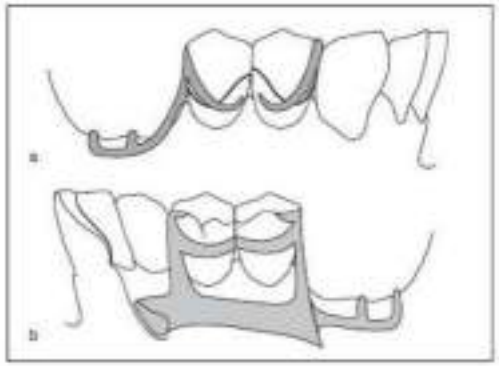


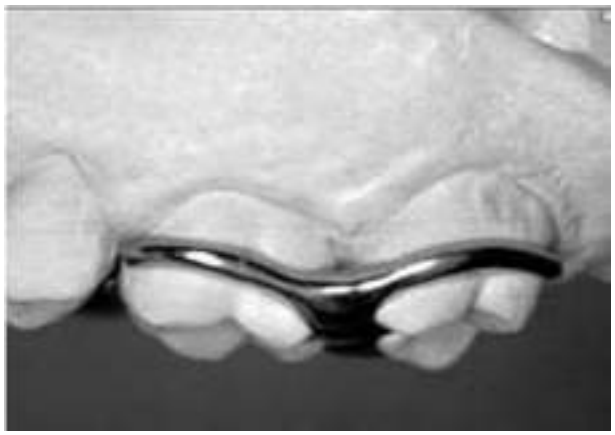
Fig 3-51 A multiple circlet, cast circumferential retentive clasp assembly is present on the first and second premolar abutments. *(a)* The facial view demonstrates two simple circlet retentive arms. *(b)* The lingual view shows the joining of the terminal aspects of the reciprocal clasps. This clasp assembly design is typically considered when the primary abutment (first premolar) is periodontally compromised.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

4. Embrasure clasp or Modified Crib Clasp

- Two circlet clasps joined at the body.
- This design is most frequently used on the side of the arch where there is no edentulous space.
- Occlusal rests must be used to support the embrasure portions of the clasp.

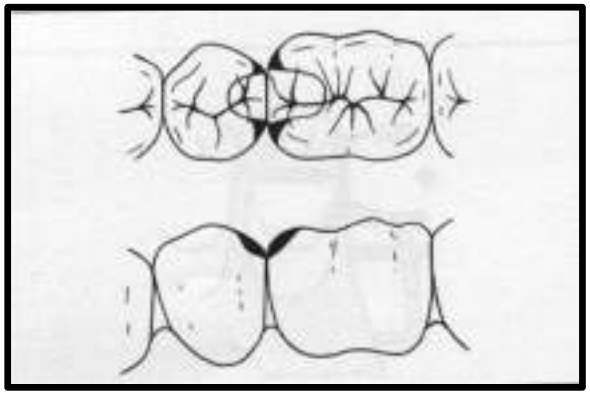


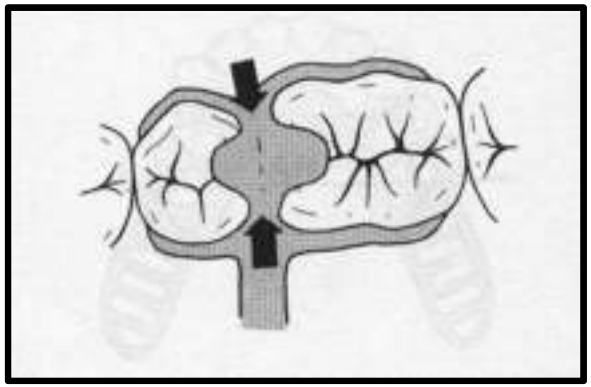
TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

4. Embrasure clasp or Modified Crib Clasp

- Breakage due to inadequate occlusal clearance and concomitant lack of metal thickness.
- The problem can be avoided by adequate rest seat preparation and by careful preparation where the clasp assembly enters and exits the rest area.





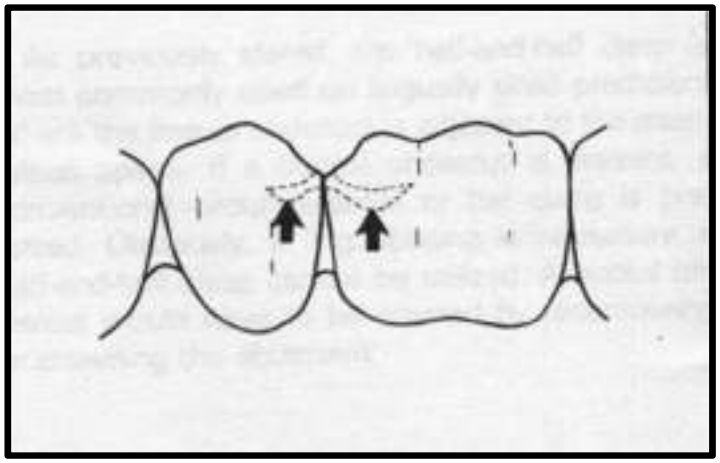
TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

4. Embrasure clasp or Modified Crib Clasp

o Wedging of the abutments can also occur if rest seat preparations are omitted or inadequate.

o The rest seat preparations must be deeper toward the center of the occlusal surface than at the marginal ridges.



TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

5. Ring Clasp

- **Indication** – tipped mandibular molars.
- **Contraindication -** limited vestibular depth precludes placement of an auxiliary bracing arm.



TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

5. Ring Clasp

Advantages:-

- Provides adequate encirclement.
- Excellent retention with adequate flexibility due to
- increased length of clasp arm

Disadvantages:-

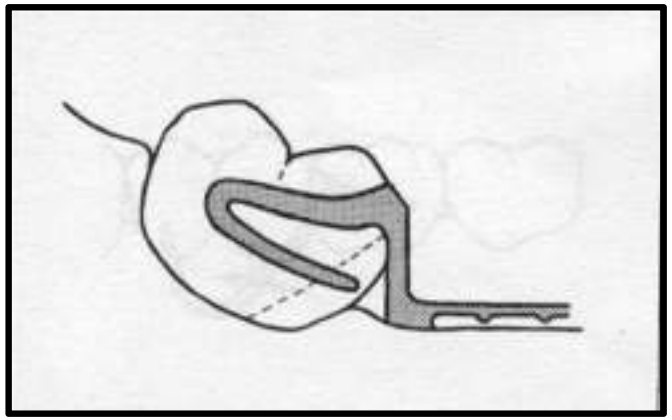
- Oral hygiene becomes more complicated.
- Decalcification of teeth.
- Increased occlusal table.
- Poor structure of clasp.
- Susceptible to distortion and fracture.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

6. C-clasp (Reverse Action, Hairpin Or Fishhook Clasp

- A simple circlet clasp in which the retentive arm loops back to engage an undercut apical to the point of origin.
- Used when a distofacial undercut is present adjacent to the edentulous space.



TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

6. C-clasp (Reverse Action, Hairpin Or Fishhook Clasp

Retentive arm has two horizontal components

1. The occlusal portion - minor connector and must be rigid.
2. The apical portion -pass over the height of contour to engage the desired undercut.

Consideration:-

- Sufficient clinical crown height.
- Space between occlusal and apical arm.
- Occlusal arm shouldn't interfere within the occlusion.

This clasp is indicated when the:

1. Soft tissue contour precludes use of a bar-type clasp and
2. When the reverse circlet cannot be considered because of a lack of occlusal clearance.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

6. C-clasp (Reverse Action, Hairpin Or Fishhook Clasp

Disadvantage:-

1. A C-clasp design generally yields inadequate flexibility as a result, the abutment may be subjected to harmful non-axial forces.

2. The C-clasp also results in considerable coverage of the abutment surface.

3. The excessive display of metal associated with this clasp often renders the C-clasp esthetically unacceptable.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

7. Onlay Clasp

- An onlay clasp consists of a rest that covers the entire occlusal surface and serves as the origin for buccal and lingual clasp arms.

- This clasp design is indicated when the occlusal surface of the abutment lies noticeably apical to the occlusal plane.

- The onlay rest serves as a vertical stop and also aids in the establishment of an acceptable occlusal plane.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

8.Wrought-wire circumferential clasp

- Introduced by Dr. O.C.Applegate in 1965.
- The combination clasp consists of an occlusal rest, a cast metal reciprocal arm, and a wrought-wire retentive arm.
- **Indication**: Kennedy Class I or Class II posterior edentulous area when the usable undercut is located at the mesiofacial line angle of the most posterior abutment.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

8.Wrought-wire circumferential clasp

- The wrought-wire component is circular in cross section, thereby permitting flexure in all directions. This omnidirectional flexure allows the clasp to flex in all planes and can minimize the transfer of potentially harmful forces to the abutment.

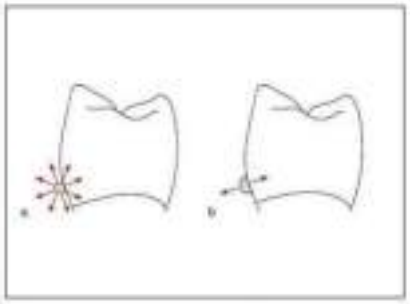


Fig 3-24 When viewed in cross-section, a round clasp *(a)* is able to flex in all directions, while a half-round clasp *(b)* is restricted to bidirectional flexure.

TYPES OF CLASP

A. CAST CIRCUMFERENTIAL CLASP

8.Wrought-wire circumferential clasp

Advantages:

1.Increased flexibility allows the clasp tips to be placed in deeper undercuts and are more esthetic.

2.Allows for greater adjustability, because of their round form, they can be adjusted in any spatial plane.

Disadvantages:

1.Additional laboratory procedure

2.Increased potential for permanent deformation by the patient.

TYPES OF CLASP

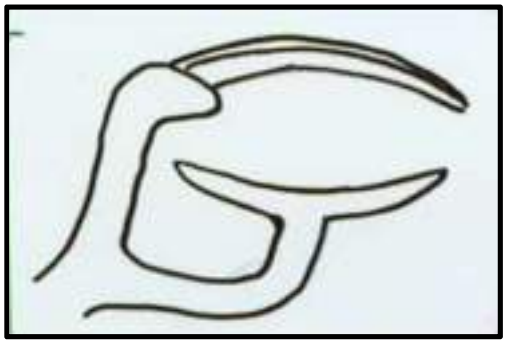
B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

- Popularized by Ewing Roach in 1930 called it the Bar Clasp.
- An infrabulge clasp approaches the undercut region of an abutment from an apical direction.
- Push type retention.
- Flexibility of clasp from length and taper.

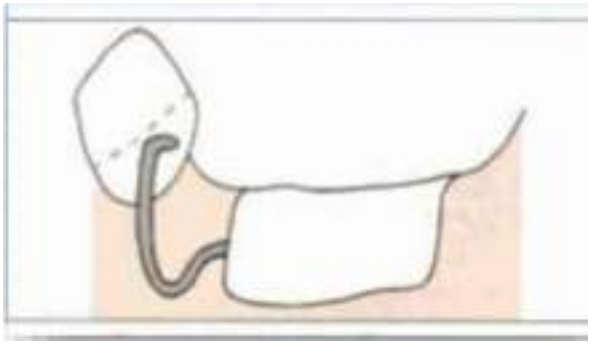
- More aesthetic than C clasp. Ex :- Y clasp, T clasp, I clasp

TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

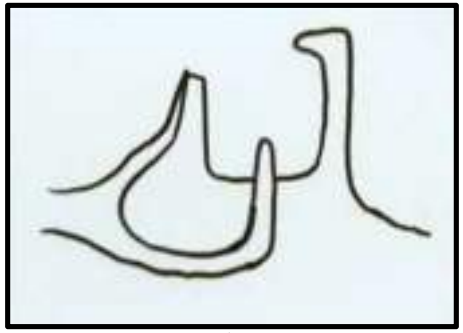


T – clasp



Modified T – clasp

Y- clasp



I- clasp

TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

1. T- Clasp

Indications :

- Kennedy Class I or Class II partially edentulous situations when an undercut is located adjacent to the edentulous area.

Contraindication :

- Available undercut is located on the mesiofacial aspect of the most posterior abutment.
- If the approach arm must cross over an area of severe soft tissue undercut.
- When the height of contour is located near the occlusal surface.

TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

1. T- Clasp

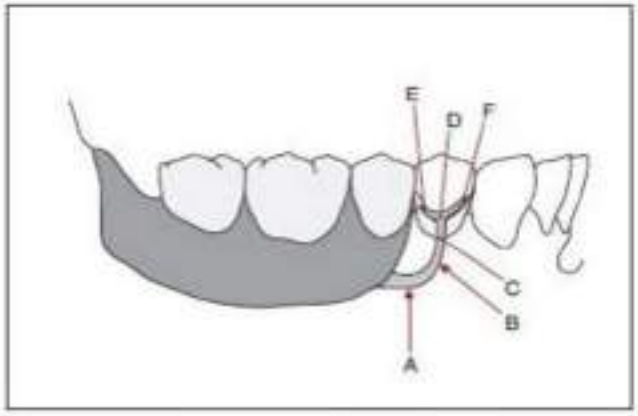


Fig 3-66 The basic components and design features of a T-clasp include the horizontal projection portion of the approach arm (A), vertical projection aspect of the approach arm (B), location where the approach arm crosses perpendicular to the free gingival margin (C), point of first tooth contact at or occlusal to the height of abutment contour (D), terminus of the retentive clasp contacting the abutment apical to the height of contour (E), and encirclement portion of the clasp contacting the abutment occlusal to the height of contour (F). Note that the approach arm of the T-clasp is both long and gently tapering to maximize flexibility.

TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

2. Modified T- Clasp

- The modified T-clasp is essentially a T-clasp that lacks the non-retentive, horizontal projection.

Uses :

•Used on canines and premolars for aesthetics

Disadvantage :

•180 ° coverage is not present which compromises bracing and reciprocation.

Fig 3-74 The modified T-clasp placed on this second premolar abutment is similar to theT-clasp except that it lacks the mesial extension of the retentive clasp.

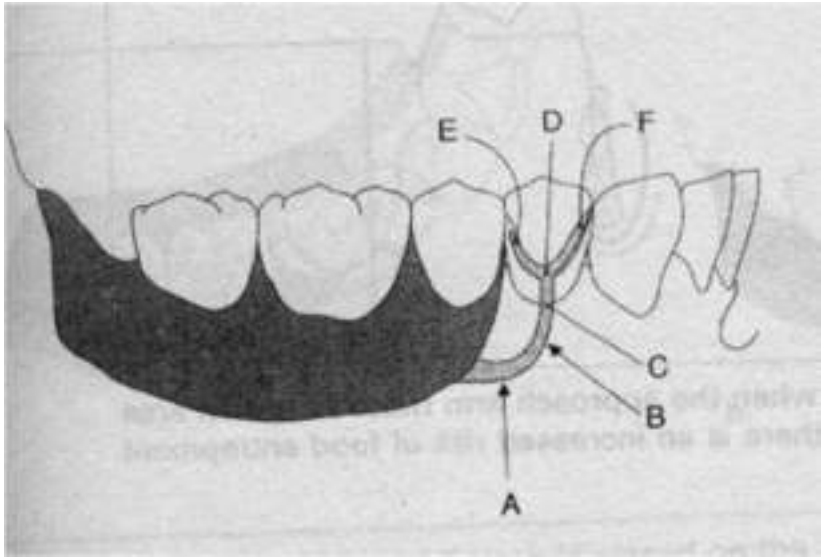
TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

3. Y Clasp

- A Y- clasp is formed when the approach arm terminates in the cervical third of the abutment , while the mesial and distal projections are positioned near the occlusal surface.

- When height of contour high on the mesial & distal line angle but lower in centre.



TYPES OF CLASP

B. Infrabulge Clasp (Vertical Projection Or Roach Or Bar Type Clasp)

3. Y Clasp

- In 1963, Kratochvil introduced I-bar design philosophy.
- Consists of
  - A mesial rest,
  - Long distal proximal plate
  - I- bar retentive element.
- I clasp lack the horizontal retentive arms but only a horizontal retentive tip.
- The retentive tip contacts the abutment surface only at the undercut region. The amount of contact is about 2 to 3mm in height and 1.5 mm in width.

TYPES OF CLASP

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