

MAJOR CONNECTORS




Definition

- ▶ *A major connector is the part of a partial removable denture that joins the components on one side of the arch to those on the opposite side. (GPT – 8)*
- ▶ *It is that unit of the partial denture to which all other parts are directly or indirectly attached.*

Functions

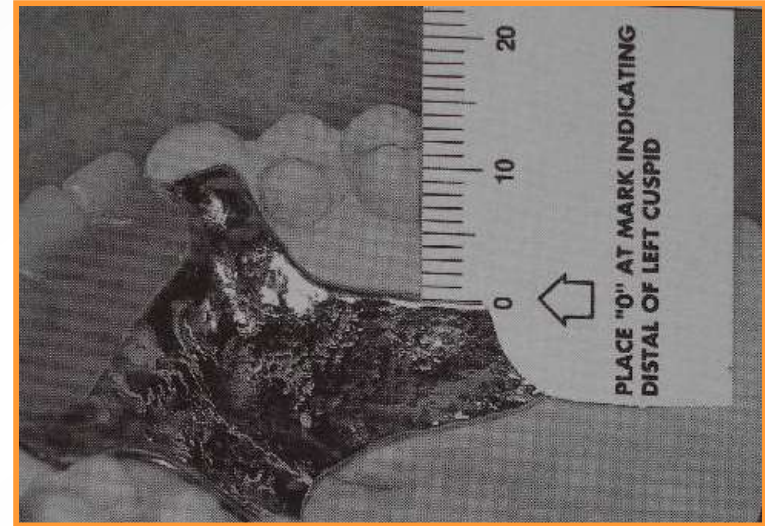
- ▶ *Unification of the major parts of the prosthesis.*
- ▶ *Distribution of the applied force throughout the arch to selected teeth and tissue.*
- ▶ *Minimization of torque to the teeth.*



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- ▶ *A rigid major connector will **limit movement** possibilities by acting as a counteracting lever.*
 - ▶ *This phenomenon is referred to as **cross – arch stability**.*

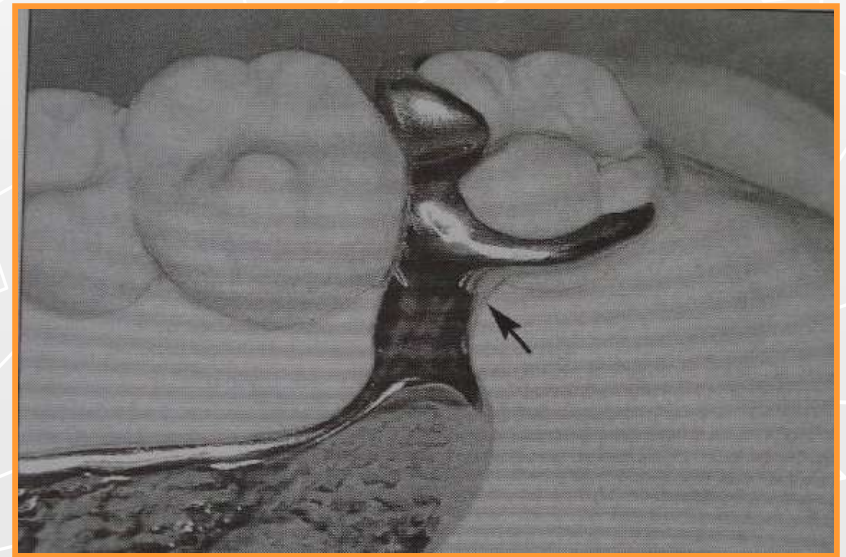
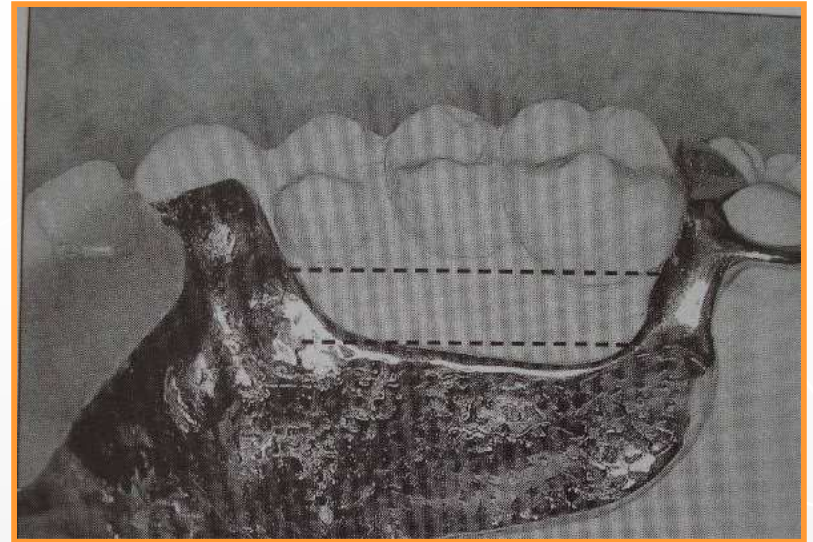
IDEAL REQUIREMENTS

1. It should be **rigid**.
2. It should **not impinge** on free gingival margin and other soft tissues.



3. The **borders** should be **parallel** to the mean marginal gingival line and gingival margins should be crossed at **right angle**.

4. Should **not allow food lodgment** beneath it.



5. Should provide *vertical support* (Maxilla) for the RPD.
6. Should provide *indirect retention* when needed (Mandible).
7. Should *enable to place* the denture bases where required.
8. Should be *comfortable* to the patient.
9. Should be made with a material, which is *biocompatible*.

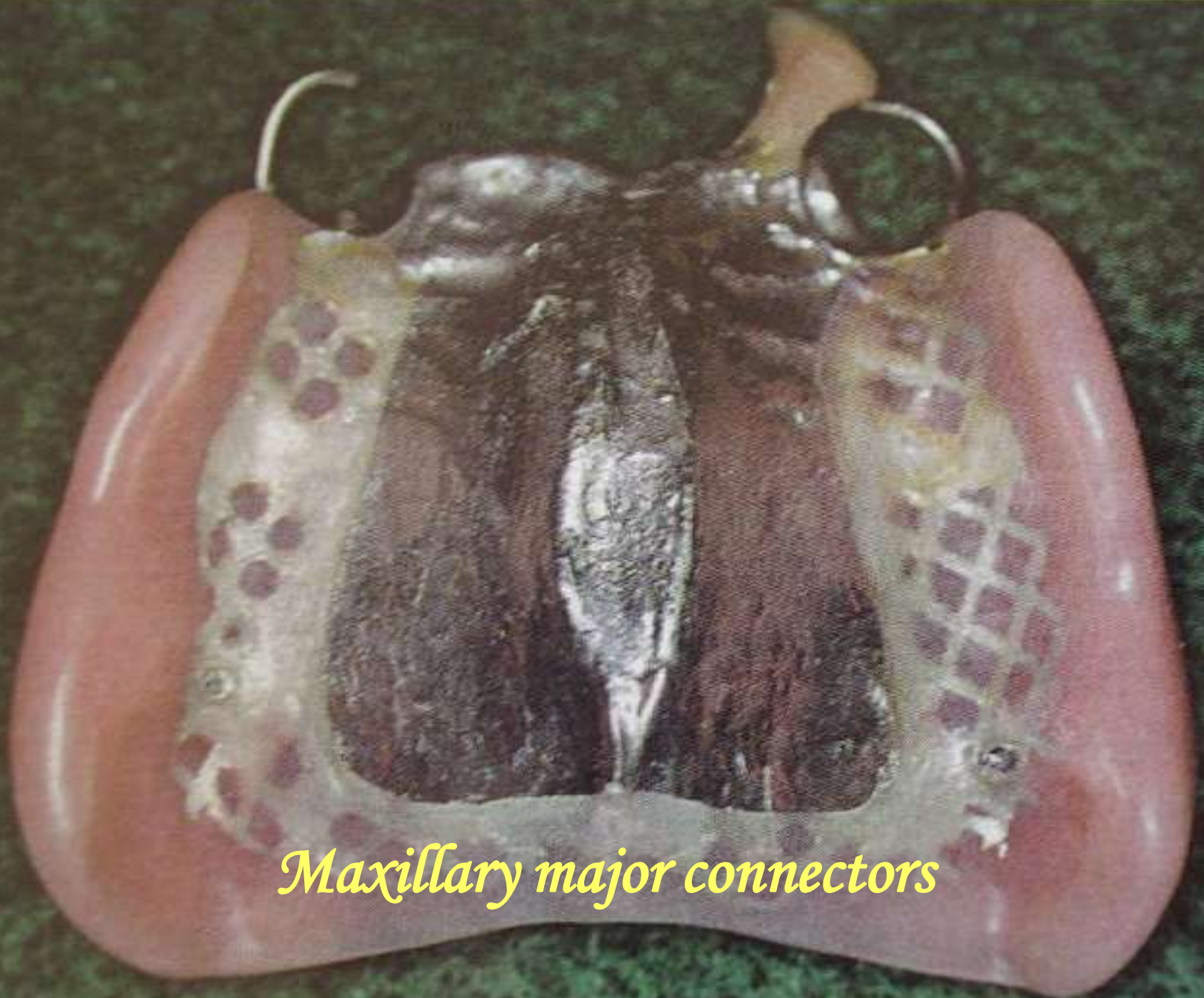
TYPES OF MAXILLARY MAJOR CONNECTORS

- 1. Single palatal bar*
- 2. Single palatal strap*
- 3. U-shaped palatal connector*
- 4. Anterior-posterior palatal bar*
- 5. Combination anterior and posterior palatal strap-type connector*
- 6. Palatal plate-type connector*

Preferred maxillary major connectors

- *Posterior palatal strap*
- *Anteroposterior palatal strap*
- *Complete palatal plate*





Maxillary major connectors

SINGLE PALATAL BAR

- *A palatal connector component of less than 8 mm in width is referred to as a bar.*
- *It is a narrow **half-oval** with its thickest point at the centre.*
- *The bar is gently curved.*



- *Effective - located between the two halves of the denture and must be **rigid** enough to provide support and cross-arch stabilization.*



- Limited to replacing short span **class 3 situations** and placed no further anterior to the second premolar position.
- Only **indication** - as an interim partial denture .



Disadvantages

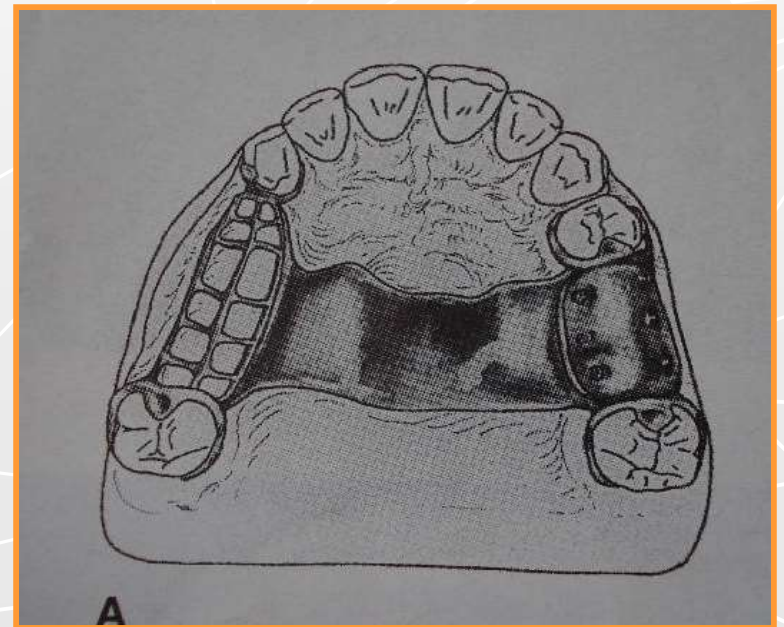
- *Most difficult for the patient to adjust, as to maintain the degree of rigidity it has to be made bulky.*
- *Narrow anterior-posterior width - little vertical support from the bony palate .*

SINGLE PALATAL STRAP

- *Most versatile therefore **most widely used.***
- *It consists of a wide band of metal with a thin cross – sectional dimension.*
- *It should not be less than 8mm wide.*

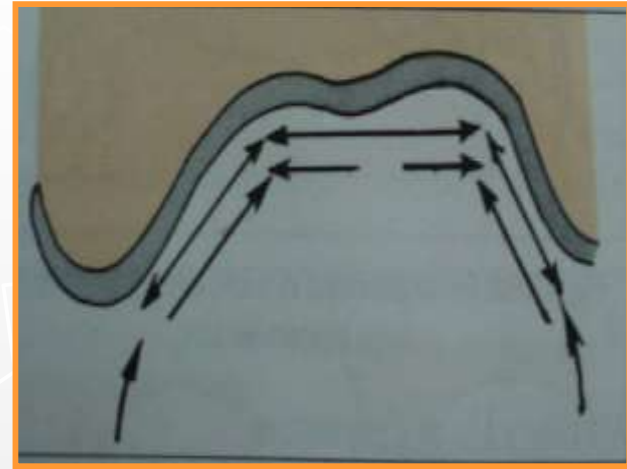


- *A wide palatal strap type may be used for unilateral distal extension situation.*
- *If the edentulous area is extensive, bilateral and the connector is modified to complete palatal type.*



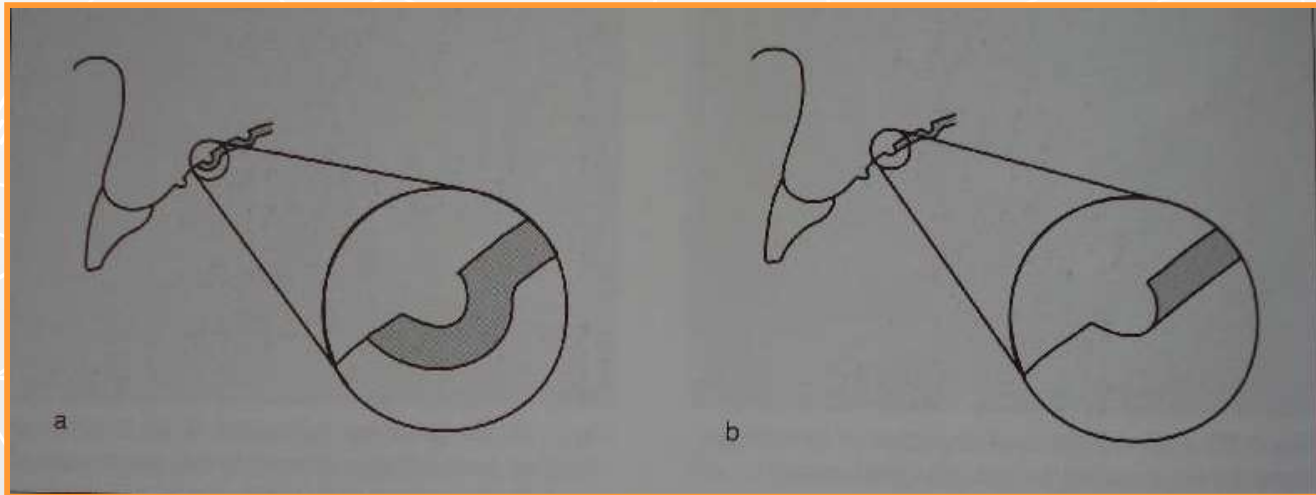
ADVANTAGES

- *Located in 2 or more planes - offers great resistance to bending and twisting forces.*
- *Covers large area of palatal tissue - stress distribution is good.*
- *Forces transmitted on different planes are counteracted more easily.*
- *Greater rigidity with less bulk - patient comfort.*
- *Retention - by the intimate contact between the metal and soft tissue.*



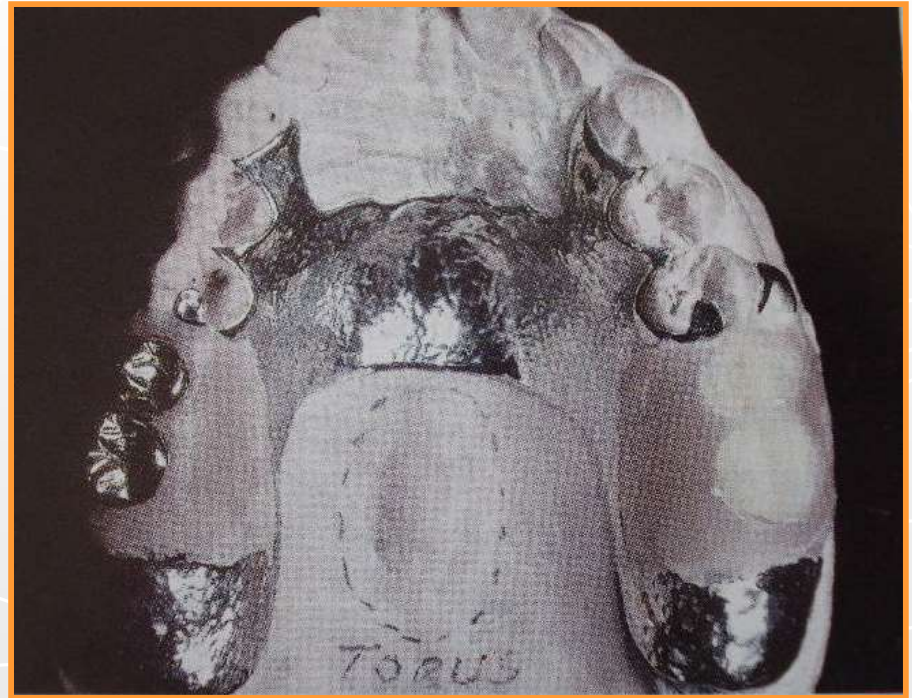
Disadvantages

- *The patient may complain of excessive palatal coverage.*
- *Papillary hyperplasia.*

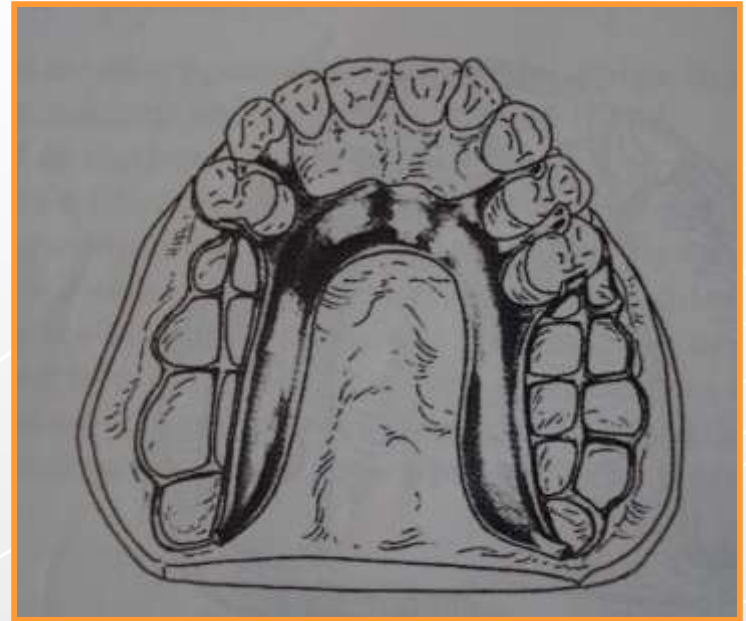


U-SHAPED PALATAL CONNECTOR

- It consists of thin band of metal running along the lingual surfaces of the remaining teeth and extending onto the palatal tissues for 6-8 mm.*



- *The borders – extend 6 mm from the gingival margin*
- *The lateral palatal borders should be at the junction of the horizontal and vertical slopes of the palate.*

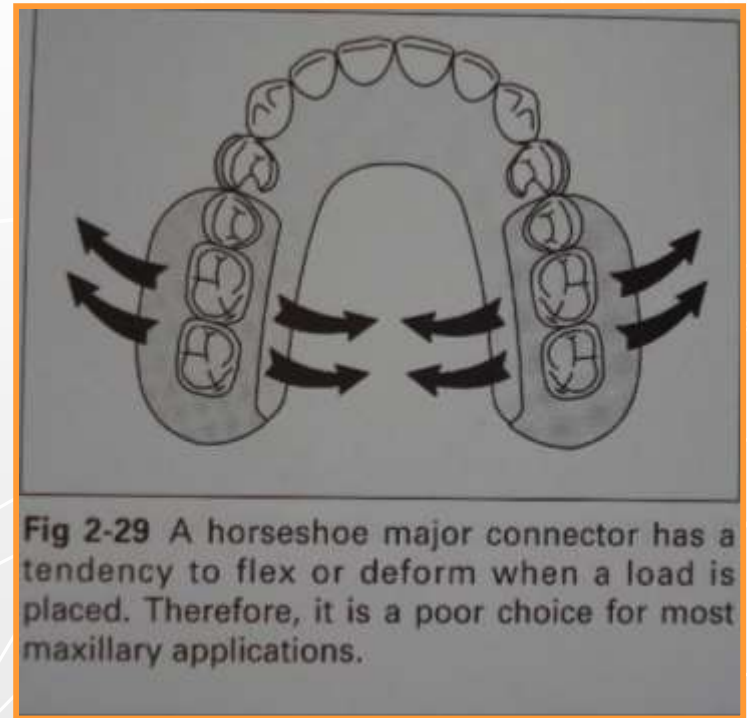


Indications

- *Can be in case of a large inoperable tori*
- *When several anterior teeth are to be replaced.*
- *In case of patients with exaggerated gag reflex.*
- *When periodontically weakened anterior teeth need some stabilizing support.*

Disadvantages

- *Lack of rigidity* - lateral flexure under occlusal force, induce torque or direct lateral force to abutment teeth.
- *May permit impingement of underlying tissues when subjected to occlusal loading.*

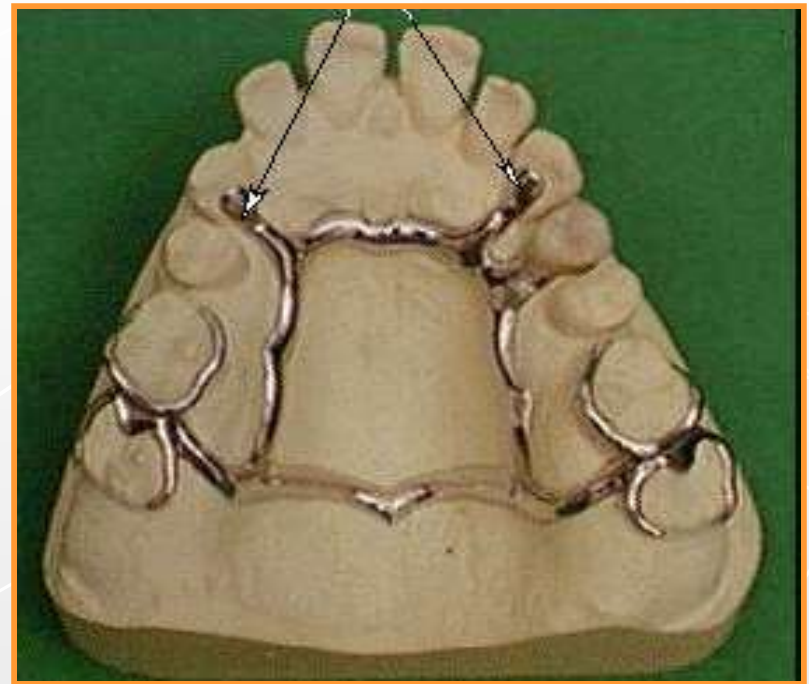


Anterior And Posterior Palatal Bar-type Connectors

- *The anterior bar is relatively flat.*
- *The posterior bar is half-oval, similar to the single posterior palatal bar connector but less bulky.*
- *The two bars are joined by flat longitudinal elements on each side of the lateral slopes of the palate.*



- *The posterior bar should be located well back in the palate just anterior to the vibrating line.*
- *The two bars, lying in different planes, produce a structurally strong L-beam effect*
- *Both borders should be gently curved and beveled.*



Indications

- *When support is not a major consideration and when the anterior and posterior abutments are widely separated.*
- *Presence of torus palatinus that is either undercut, lobulated, or too massive.*
- *It may be used as a compromise for the patient*

Contraindications

- *In reduced periodontal support of the remaining teeth*

Advantages

- *The main advantage - rigidity.*
- *In comparison to the amount of soft tissue coverage, it is by far the most rigid maxillary major connector*

Disadvantages

- *Because of the limited palatal tissue contact, little support is derived from the bony palate*
- *May interfere with speech- especially the anterior bar.*

ANTERIOR AND POSTERIOR PALATAL STRAP-TYPE CONNECTOR

- *Structurally, this is a rigid palatal major connector.*
- *Each palatal strap should be flat and a **minimum of 8 mm** wide.*
- *The straps should be located as far posteriorly as possible to avoid interference with the tongue.*



- *Borders - 6 mm from the free gingival margin or should extend onto the lingual surfaces of the teeth.*
- *All the borders should be finished in smooth, gentle curves.*
- *The open area in the palatal region should be at least 20 × 15 mm.*



Indications

- *Kennedy's class 1 and class 2 arches.*
- *Long edentulous spans in class 2 modification 1 arches.*
- *Class 4 arches.*
- *In case of inoperable tori.*

Disadvantages

- *Even though metal over rugae area may be thinner - interference with phonetics.*
- *The extensive length of borders may cause annoyance or discomfort.*

PALATAL PLATE-TYPE CONNECTOR

- *The full palate connector - thin, broad, contoured palatal coverage, with the natural anatomy of the palate reproduced..*
- *The anterior border - 6 mm from the marginal gingiva or must cover the cingula of the anterior teeth.*



- *The posterior border - extends to the juncture of the soft and hard palate.*
- *The material which covers the residual ridges should be one that can be refitted easily (acrylic resin)*
- *The posterior border can be fabricated of either metal or acrylic resin.*



Advantages

- *It is thin and reproduces faithfully the anatomic contours*
- *Its uniform thickness and the thermal conductivity of the metal are readily acceptable to the tongue and underlying tissue.*
- *Interfacial surface tension between metal and tissues provides the prosthesis with greater retention.*

Disadvantages

- *Inflammation or hyperplasia*
- *Problems with phonetics*

Indications

- *Class 2 arch with a large posterior modification space.*
- *In most situations in which only some or all anterior teeth remain*
- *when the last remaining abutment tooth on either side of a class 1 arch is the canine or first premolar tooth.*

Contraindication

- *Presence of tori which cannot be surgically removed a full palatal coverage cannot be given.*

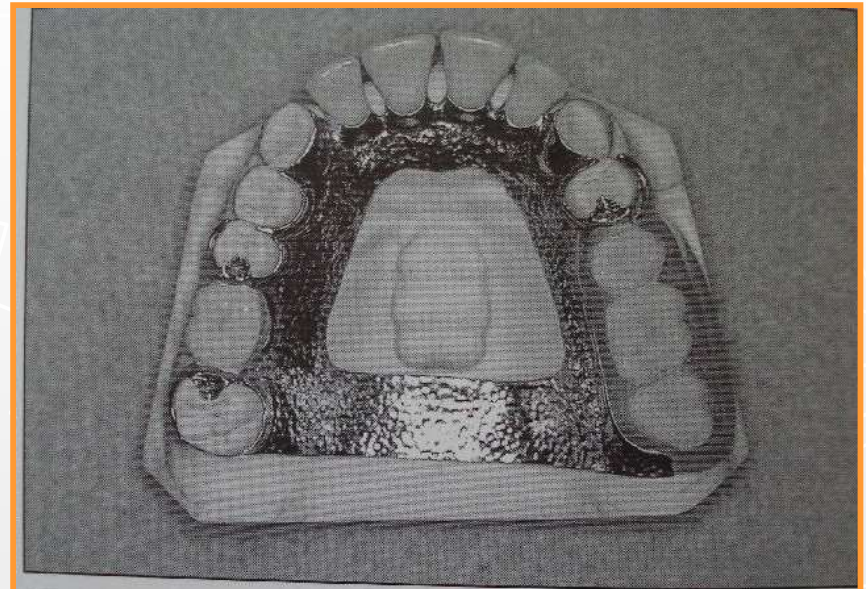


Fig 2-20 Coverage of tori should be avoided if possible. The tissues covering tori are extremely thin and susceptible to irritation.



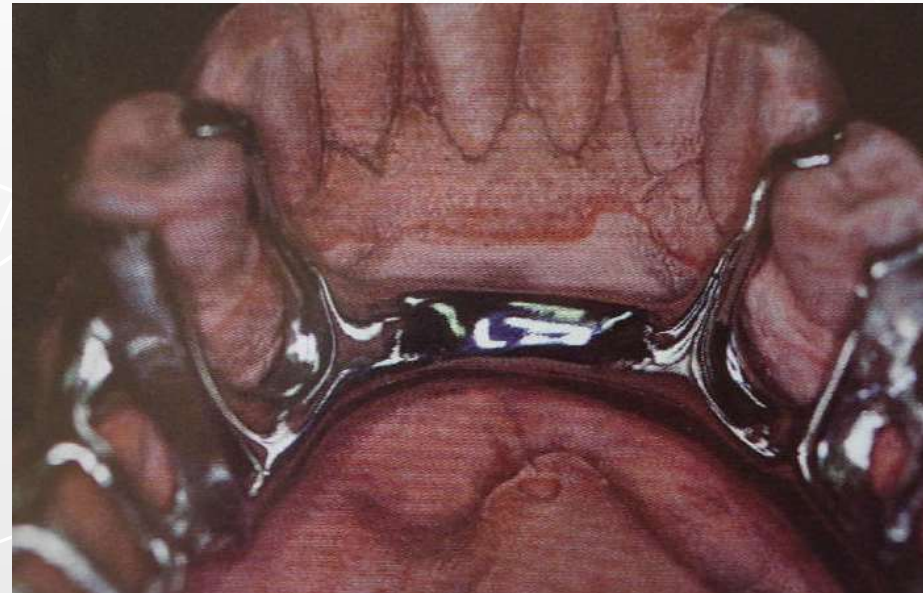
Mandibular Major Connectors

TYPES OF MANDIBULAR MAJOR CONNECTORS

1. *Lingual bar.*
2. *Linguo plate*
3. *Sublingual bar*
4. *Lingual bar with cingulum bar*
5. *Cingulum bar*
6. *Labial bar.*

Lingual bar major connector

- *The basic form of a mandibular major connector is a **half-pear** shape, located above moving tissue but as far below the gingival tissue as possible.*



- *Availability of space for connector is one of the important factor to be considered. At least 8mm of vertical space between the active tissues of the floor of the mouth and the gingival margins of the teeth is required.*



Advantages

- *Lingual bar connector has minimal tissue coverage and has minimal contact with oral tissues.*
- *It does not contact the teeth, so decalcification of the tooth surface is minimized.*

Disadvantages

- *It may be flexible if poorly constructed.*
- *Rigidity is less compared to a well constructed lingual plate.*

Indications

- *Where sufficient space exists between the slightly elevated alveolar lingual sulcus and lingual gingival tissues.*

Contraindications

- *Inoperable lingual tori.*
- *Highly attached lingual frenum.*
- *Interferences to elevation of the floor of the mouth during functional movements.*

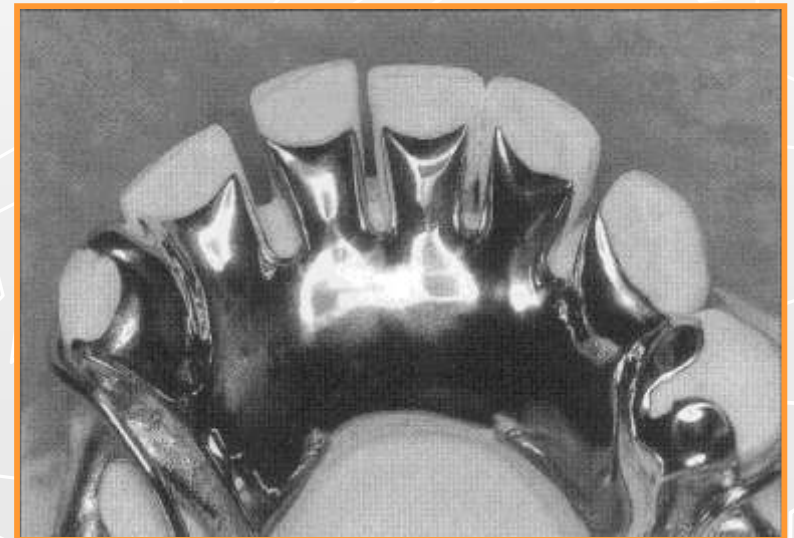
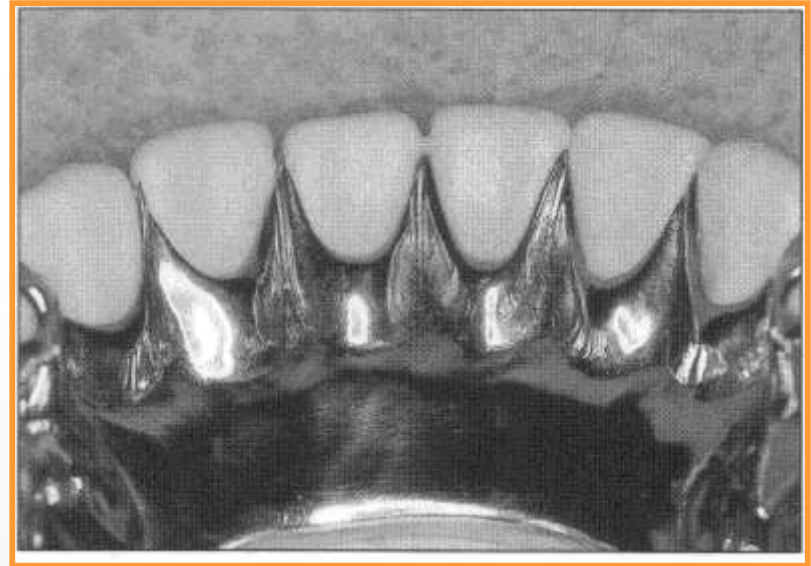
Lingual plate

- *linguoplate, lingual strap, lingual apron, lingual shield.*
- *The lingual plate must be used when a high lingual frenum or the floor of the mouth prevents the use of a lingual bar.*
- *It may be used in combination with a labial bar for **splinting**.*
- *Terminal tooth rests should be used to provide a vertical stop at each end of the linguoplate to prevent labial movement of teeth.*



Characteristics and location:

- *Half-pear shaped with bulkiest portion inferiorly located.*
- *Thin metal apron extending superiorly to contact cingula of anterior teeth and height of contour of posterior teeth.*
- *Inferior border at the ascertained height of the alveolar lingual sulcus when patients tongue is elevated.*



Indications:

- *Where alveolar lingual sulcus so closely approximates the lingual gingival crevices such as high lingual frenum attachments.*
- *If residual ridges in Class 1 arch have undergone severe vertical resorption that they will offer only minimal resistance to horizontal rotation.*
- *It can be used to stabilize periodontally weakened teeth.*

Contraindications:

- *In linguallly inclined mandibular anterior teeth.*
- *Mandibular teeth with wide embrassures and diastema.*

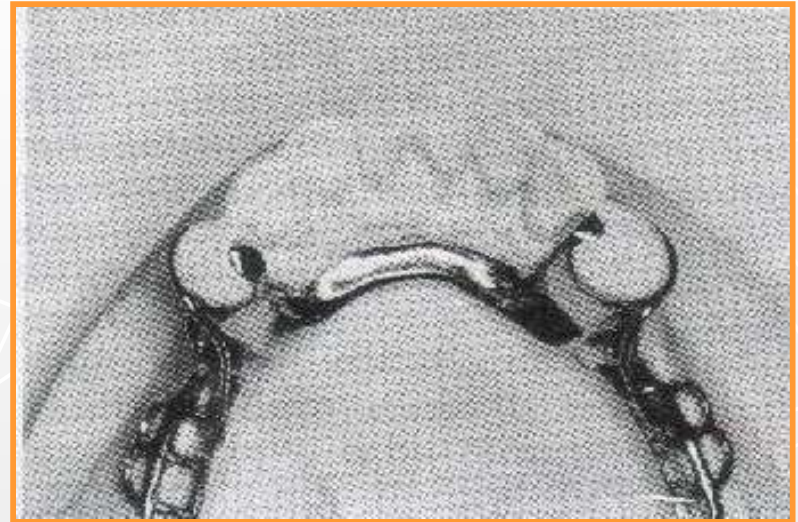
Disadvantages:

- *It covers the tooth structure and the gingival tissue.*
- *The metal coverage of the free gingival tissue prevents physiological stimulation and self-cleansing of these areas by saliva.*



Sublingual bar major connector:

A modification of the lingual bar that has been demonstrated to be useful when the height of the floor of the mouth does not allow placement of superior border of the connector at least 4-mm below free gingival margin.



Indications:

- *The height of the floor of the mouth in relation to the free gingival margin is **less than 6mm.***
- *If it is desired to keep the free gingival margins of anterior teeth exposed and there is inadequate depth of the floor of the mouth.*

Contraindications:

- *Lingually tilted remaining natural teeth.*
- *Inoperable lingual tori.*
- *High attached lingual frenum.*

Mandibular lingual bar with continuous bar (double lingual bar or split bar)

- This type of major connector is also called “**Kennedy bar**” it distribute stresses to all of the teeth with which it comes in contact there by reducing the stresses to the underlying tissues.
- It is also referred as “**continuous lingual clasp**” major connector, because of series of clasp arms connected on the lingual surfaces of lower anterior teeth.

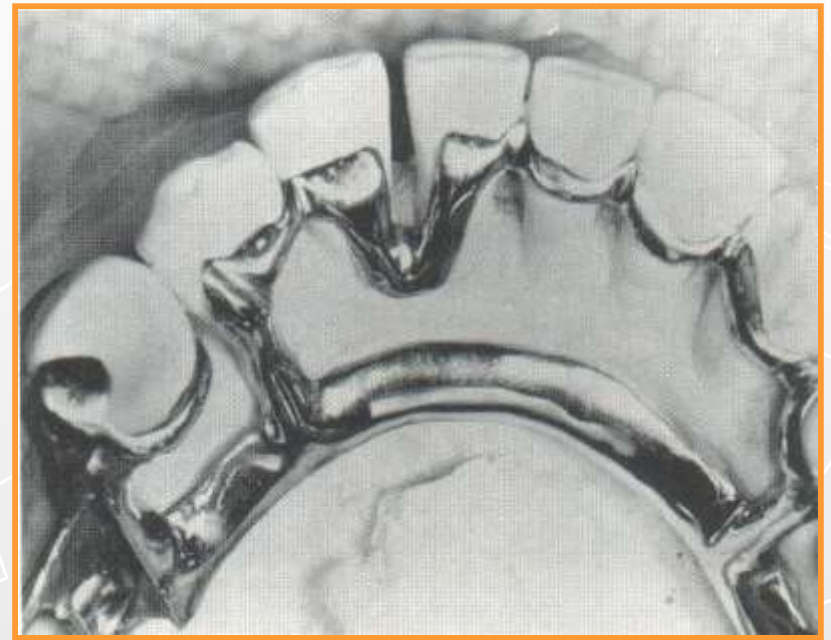


- *Shaped same as lingual bar.*
- *Thin narrow metal strap located on cingula of anterior teeth scalloped to follow interproximal embrassures.*



Indications:

- *It is mainly used as a major connector in periodontally treated anterior teeth with wide inter-proximal embrasures.*
- *When linguoplate is contraindicated due to poor axial alignment of anterior teeth.*



Contraindications:

- *In severely **crowded** anterior teeth.*

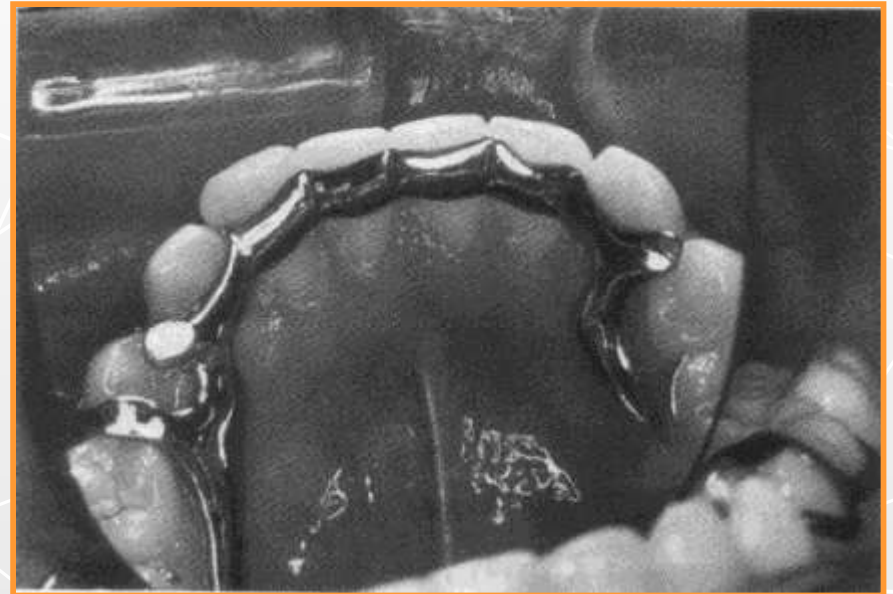
Disadvantages:

- *Patient may feel discomfort because it alters the normal position of the tongue.*
- *If connector does not maintain intimate contact with tooth surface there will be food entrapment.*



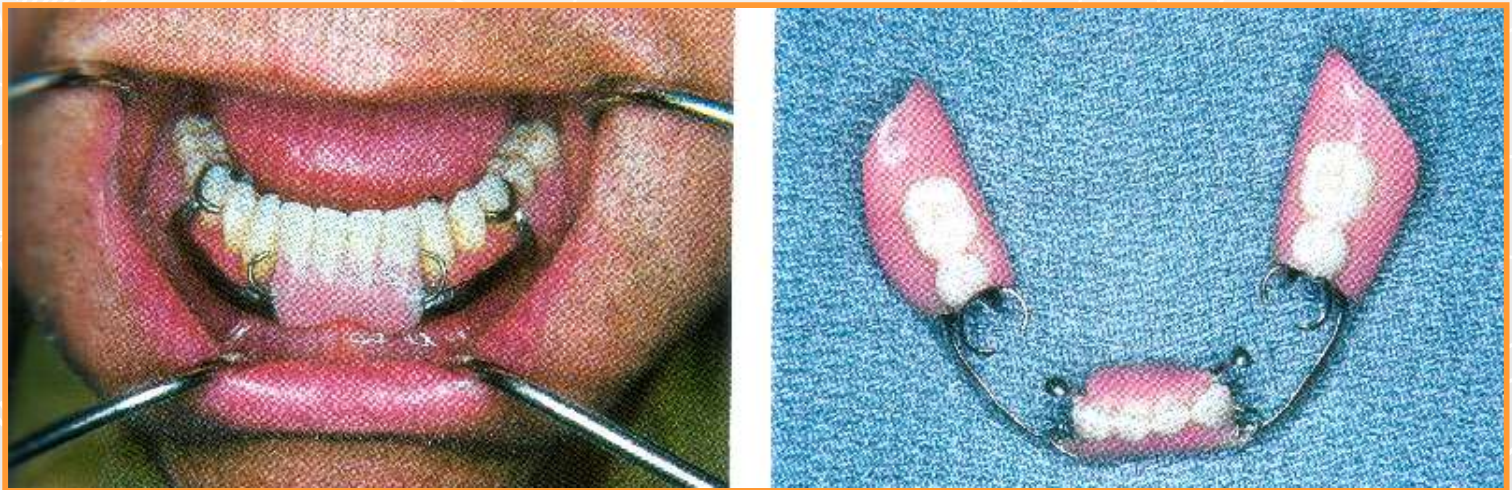
Mandibular continuous bar (Cingulum bar)

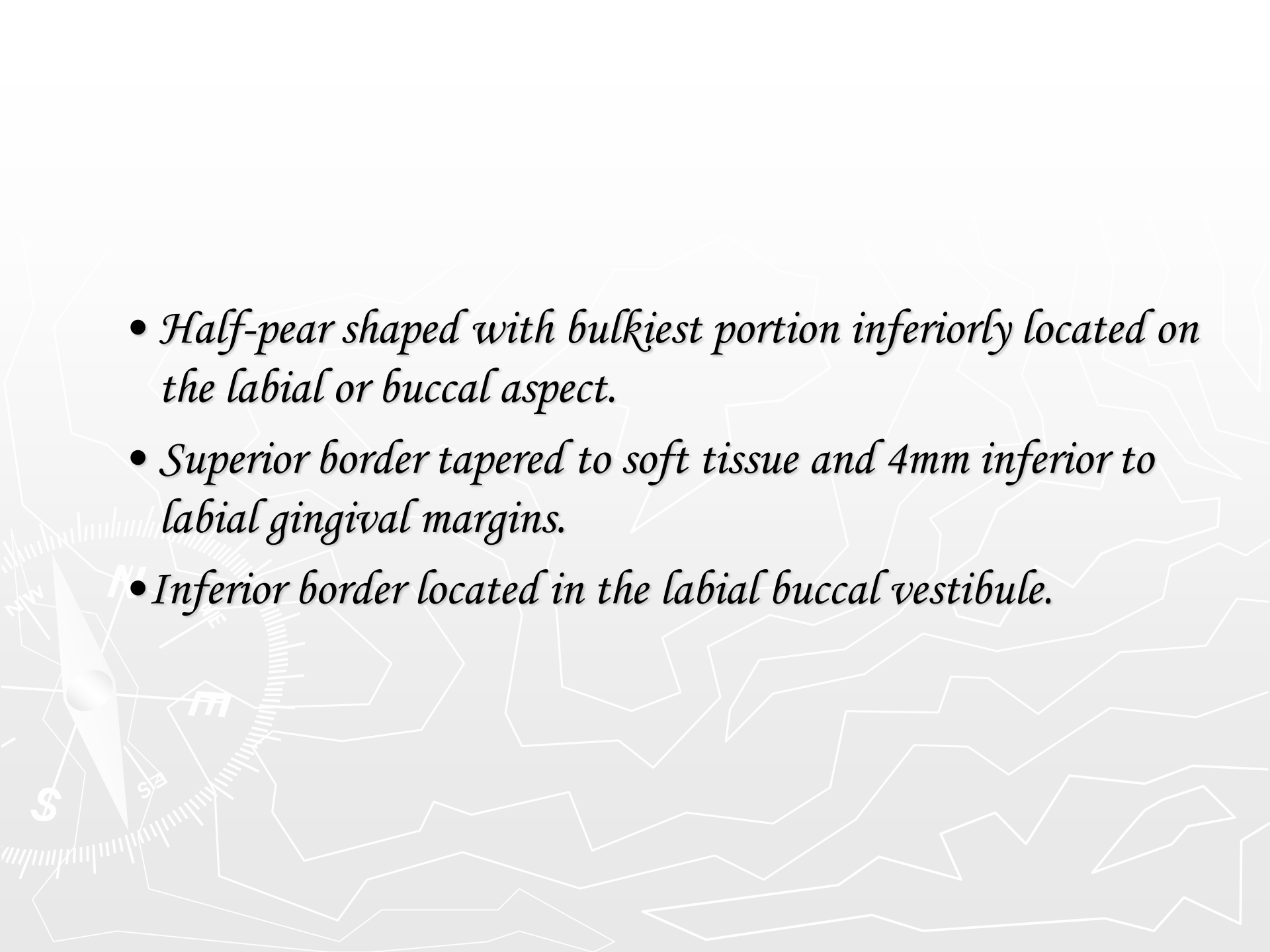
- *Improper axial alignment of the anterior teeth will necessitate excessive blockout of interproximal undercuts. These types of cases indicates continuous bar major connector.*
- ***Contraindications***
 - *In lingually tilted anterior teeth.*
 - *Wide diastema between mandibular anterior teeth.*



Mandibular labial bar major connector

- The labial bar has a limited application in cases where large inoperable **lingual tori** and severely lingually inclined lower anterior and premolars prevents the use of other mandibular major connectors.*



- 
- *Half-pear shaped with bulkiest portion inferiorly located on the labial or buccal aspect.*
 - *Superior border tapered to soft tissue and 4mm inferior to labial gingival margins.*
 - *Inferior border located in the labial buccal vestibule.*

Hinged continuous labial bar

This type of major connector is the modification of linguoplate which is incorporated in the “Swing-lock” design consists of labial or buccal bar i.e. connected to the major connector by hinge on one end and latch at the other end.



- *Support provided by multiple rests on the remaining natural teeth.*
- *Stabilization and reciprocation provided by a lingual plate.*
- *Retention is provided by bar type retentive clasp arms projecting from the labial or buccal bar and contacting the infra bulge areas on the labial surfaces.*

MATERIALS USED FOR MAJOR CONNECTORS

The various alloys that can be used in constructing removable partial denture framework are:

- ▶ *1. Type iv gold alloy*
- ▶ *2. Nickel chromium*
- ▶ *3. Cobalt-chromium*
- ▶ *4. Co- cr- ni*
- ▶ *5. Titanium and its alloys*



THANK YOU ALL