Mandibular Major Connectors

3RD GRADE

LEC. 6

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1. Relief is provided for soft tissue under all portions of the mandibular major connector and at any location where the framework crosses the marginal gingiva.

2. The inferior border of mandibular major connectors should be gently rounded after being cast to eliminate any sharp edge.

3. Not impinging on the movable floor of the mouth → only reaching the "functional depth"

4. Lingual bar major connector should be located at least 4 mm inferior to gingival margins and farther if possible.

5. If less than 8 mm exists between gingival margins and the movable floor of the mouth, a lingual plate, a sublingual bar, or a continuous bar is preferred as a major connector.

**Types:**

The six types of mandibular major connectors include the following:

1. Lingual bar.

2. Lingual plate.

3. Double Bar (Lingual bar with cingulum bar (continuous bar)).

4. Labial bar.

5. Cingulum bar (continuous bar).


➢ The lingual bar and the lingual plate are the most common major connectors used in mandibular removable partial dentures.

1. **Lingual bar:**
Characteristics:

- The most common type.
- Located above moving tissue.
- As far below the gingival tissue as possible.
- It must be contoured so that it does not present sharp margins to the tongue and cause irritation or annoyance by an angular form.
- The superior border of a lingual bar connector should be tapered toward the gingival tissue superiorly, with its greatest bulk at the inferior border, resulting in a contour that has a \textbf{half-pear shape}.
- The inferior border of the lingual bar should be slightly rounded when the framework is polished → not impinging on the lingual tissue when the denture bases rotate inferiorly under occlusal loads.
- Frequently, additional bulk is necessary to provide rigidity particularly when the bar is long or when a less rigid alloy is used.

\textbf{Note:} Clinically acceptable methods may be used to determine the relative height of the floor of the mouth and locate the inferior border of a lingual mandibular major connector. The most reliable method is to measure the height of the floor of the mouth in relation to the lingual gingival margins (most apical portion) of adjacent teeth with a periodontal probe. When these measurements are taken, the tip of the patient’s tongue should just lightly touch the vermilion border of the upper lip. The measurements are recorded and transferred to both diagnostic and master casts.
Contraindications:
1. Less than 8 mm space is available.
2. Sever lingual inclination of both teeth and tissue (needs too much relief).
3. Mandibular tori.

Advantages:
1. Simple.
2. Minimal contact with the remaining teeth and soft tissues.
3. Decreased plaque accumulation.
4. Increased tissue stimulation.

These factors aid in the long-term maintenance of teeth and tissues.

Disadvantages:

If care is not taken in the design & construction (improper waxing or aggressive finishing) of a lingual bar, it could result in a less rigid framework concentration of destructive forces at certain points transferring them to teeth or tissues.
2. **Lingual plate:**

It is a half-pear lingual bar with a thin, solid piece of metal extending from its superior border.

![Lingual plate diagram](image)

**Characteristics:**

a. Made as thin as is technically feasible.

b. Go up to the Cingula and close the interproximal spaces up to the contact points giving a **Scalloped shape**, this sealing:
   - Gives more adaptation.
   - Prevents food impaction.
   - Decreases incidence of caries.

c. The plate should have rests to avoid its rotation.
d. The superior border should be a knife-edge to avoid “ledging” effect on the lingual surfaces of the teeth, which is annoying to the tongue.

**Note:** When a patient has open embrasures, or the anterior teeth are widely spaced, a modification is made called a **Step-back technique** to avoid any unwanted display of metal. Here, the superior border should extend to the cingulum and contact areas then turn apically down to the gingival margin in a right angle then back up to the adjacent tooth giving finger-like form.

**Indication:**
1. Insufficient vertical space gingivally (less than 4 mm.) preventing the use of a lingual bar.
2. The remaining teeth have lost much of their periodontal support and require splinting.
3. Could be used in patients with mandibular tori, relief must be provided during framework fabrication to prevent irritation of thin soft tissues covering these tori.

**Advantages:**
1. Provides rigidity without interfering with functional movements of the tongue and floor of the mouth.
2. Provides splinting of weak teeth by stabilizing them and distributing forces to the remaining teeth and soft tissues.

3. Offers indirect retention through its rests.

4. Many patients consider it more comfortable than a lingual bar.

**Disadvantages:**

Excessive coverage may contribute to enamel decalcification and irritation of soft tissues in patients with poor oral hygiene.

**Contraindication:**

Poor oral hygiene (preventing self-cleansing and gingival massaging).

4. **Double Bar (Kennedy Bar):**

**Characteristics:**

✓ Consists of a lingual bar and a cingulum bar (continuous bar).

✓ The cingulum bar runs over the lingual surfaces of teeth on/above the cingula of teeth having a scalloped pattern.

✓ The lingual surfaces of teeth & interproximal soft tissues are exposed.

✓ The two bars are joined together by rigid minor connectors at both ends embedded in the interproximal areas to hide the metal and to be less noticeable to the tongue.

✓ Rests should be placed at the upper bar ends to prevent it from sinking downward and causing orthodontic movements to the teeth.
Advantages:
1. Tissue stimulation is good due to more flow of saliva.
2. Provides indirect retention through its rest.
3. Horizontal stability

Disadvantages:
1. Tendencies to trap debris when marked crowding of anterior teeth exists, as it produces undercuts and makes bar adaptation difficult.
2. Annoying to the tongue and hence uncomfortable to the patient.

4. Labial bar:

Characteristics:
✓ As its name suggests, it runs across the mucosa on the labial surface of mandibular arch.
✓ Looks like a Lingual bar (half pear, flushed with the tissue).
✓ Longer, wider & thicker than the lingual bar.

Indications:
Used in cases where it is impossible to use lingual bar or plate, such as:
1. Malpositioned or lingually inclined teeth and tissue.
2. Large mandibular tori.

➢ **Swing-Lock**: (hinged continuous labial bar)

- A modification to the labial bar, which consists of a labial or buccal bar that is connected to the major connector (lingual plate) by a hinge at one end and a latch (lock) at the other end.
- Multiple rests on the remaining natural teeth provide support.
- A lingual plate that contacts the remaining teeth provides stabilization and reciprocation.
- The labial bar has retentive struts. Retention is provided by a bar type of retentive clasp with arms projecting from the labial or buccal bar and contacting the infrabulge areas on the labial surfaces of the teeth.

Use of the Swing-Lock is indicated in the following conditions:

a. **Missing key abutments.** The absence of a key abutment (such as a canine) suggests using the remaining teeth for retention and stability.

b. **Unfavorable tooth contours.** Uncorrectable tooth contours even with a restoration or excessive labial inclinations of anterior teeth prevent conventional clasp designs.
c. **Unfavorable soft tissue contours.** Extensive soft tissue undercuts may prevent proper location of component parts of a conventional removable partial denture or an overdenture.

d. **Teeth with questionable prognoses.** The possibility of losing a key abutment tooth affects the stability and retention of a conventional prosthesis. Because all remaining teeth function as abutments in the Swing-Lock denture, it seems that the loss of a tooth would not compromise retention and stability.

Contraindications to the use of Swing-Lock are:

a) Poor oral hygiene or lack of plaque control by the patient.

b) The presence of a shallow buccal or labial vestibule.

c) High frenal attachment.

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**Advantage of a Labial bar:**

➢ The remaining natural teeth are tipped very far lingually so that no other major connector can be used.

**Disadvantage of a Labial bar:**
a. Patient’s acceptance of this type of a major connector is poor as the bulk of it distorts the lower lip, and its position causes great discomfort to the patient.
b. The labial vestibule is not deep enough to allow for a rigid connector without impinging on the free gingival margins.

5. **Sublingual Bar:**

**Characteristics:**
- A modification of the lingual bar.
- The bar shape is the same as that of a lingual bar.
- Placement is inferior and posterior to the usual placement of a lingual bar, lying over and parallel to the anterior floor of the mouth.

**Indications:**
- Useful when the height of the floor of the mouth does not allow placement of the superior border of the bar at least 4 mm below the free gingival margin.
- A sublingual bar can be used instead of a lingual plate if the lingual frenum does not interfere.
c. The presence of an anterior lingual undercut that would require considerable blockout for a conventional lingual bar.

**Contraindications:**

a. Interfering lingual tori.
b. High attachment of a lingual frenum.
c. Interference with elevation of the floor of the mouth during functional movements.

6. **Cingulum Bar (Continuous Bar):**

**Characteristics:**

- It is located on or slightly above the cingula of the anterior teeth.
- May be added to the lingual bar (Double bar) or can be used independently.

**Indications:**

a. When a lingual plate is the major connector of choice, but the axial alignment of the anterior teeth is such that excessive blockout of interproximal undercuts must be made.
b. When wide diastema exists between the lower anterior teeth, a continuous bar retainer may be more esthetically acceptable than a lingual plate.
Disadvantages:
  a. Annoying to the tongue.
  b. Causes food entrapment.
  c. Flexible.

Review of Indications for Mandibular Major Connectors:
1. A tooth-supported RPD → Lingual bar is the treatment of choice.
2. -Insufficient room between the floor of the mouth and the gingival margins (less than 8mm.)
   -Large inoperable tori.
   -High lingual frenal attachment
   → Lingual plate
3. -Teeth with reduced periodontal support.
   -Need for stabilization.
   → Lingual plate
4. Ant. Teeth with reduced periodontal support.
   +
   Large interproximal spaces.
   → *Step-back Technique
   *Double Bar
5. All post. teeth are to be replaced → Lingual plate
6. A labial bar is rarely indicated.

References:
- Stewart’s Clinical Removable Partial Prosthodontics.
- McCracken’s Removable Partial Prosthodontics.