

Prosthetic Dentistry

PARTIAL DENTURE : 6 MANDIBULAR MAJOR CONNECTOR

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Unlike maxillary major connectors, mandibular major connectors often need relief between the surface of rigid metal and the underlying soft tissue.

Bead lines are not used with mandibular major connectors as such contact may cause irritation, ulceration or patient discomfort.

Mandibular major connectors

types of mandibular major connectors are:

- 1- Lingual bar.**
- 2- Linguoplate (lingual plate).**
- 3- Sublingual bar.**
- 4- Lingual bar with cingulum bar (continuous bar).**

5- Cingulum bar (continuous bar).

6- Labial bar and buccal bar.

The lingual bar and linguoplate are by far the most common major connectors used in mandibular removable partial dentures. Relief is provided for soft tissue under all portions of mandibular major connector and any location where the framework crosses the gingival margin.

The inferior border of a lingual mandibular major connector must be located so that it does not impinge on the tissue in the floor of the mouth because it changes elevations during the normal activities of mastication, swallowing, speaking, licking the lips, and so forth. Yet, at the same time it seems logical to locate the inferior border of these connectors as far inferiorly as possible to

avoid interference with the resting tongue and trapping of food substances when they are introduced into the mouth.

There are at least two clinically acceptable methods to determine the relative height of the floor of the mouth to locate the inferior border of a lingual mandibular major connector:

1- The first method is to measure the height of the floor of the mouth in relation to the lingual gingiva margins of adjacent teeth with a periodontal probe. During these measurements, the tip of the patient's tongue should be just lightly touching the vermillion border of the upper lip. Recording of these measurements permits their transfer to both diagnostic and master cast, thus ensuring a rather advantageous location of the inferior border of the major connector.



2- The second method is to use an individualized impression tray having its lingual borders 3 mm short of the elevated floor of the mouth and then to use an impression material that will permit the impression to be accurately molded as the patient licks the lips. The inferior border of the planned major connector can then be located at the height of the lingual sulcus of the cast resulting from such an impression.

1- Lingual bar:



Characteristic and location:

- 1- Half pear shaped in cross section with bulkiest portion inferiorly located.**
- 2- The major connector must be contoured so that it does not present sharp margins to the**

tongue and cause irritation by an angular form.

3- Superior border tapered to soft tissue (gingival tissue).

4- Superior border located at least 4 mm inferior to gingival margins and more if possible.

5- Inferior border located at the ascertained height of the alveolar lingual sulcus when the patient's tongue is slightly elevated.

6- The inferior border of the lingual bar should be slightly round when the framework is polished. A round border will not impinge on the lingual tissue when the denture bases rotate inferiorly under occlusal loads.

Indications:

1- The lingual bar should be used for mandibular removable partial dentures where sufficient space exists between the slightly elevated alveolar lingual sulcus and the lingual gingival tissue (space should be 9-11 mm).

2- The lingual bar is the mandibular major connector of choice if sufficient bracing and indirect retention can be provided by clasp and indirect retainers, and if future additions of prosthodontic teeth to the framework to replace extracted natural teeth are not anticipated.

3- Diastemas or open cervical embrasures of anterior teeth.

4- Overlapped anterior teeth.

Contraindications:

1- Less than 8 mm between the marginal gingival and the activated lingual frenum and floor of the mouth.

2- Only a few remaining teeth which must be contacted to provide a reference for fitting the framework and indirect retention.

3- Lingually inclined teeth.

4- An undercut lingual alveolar ridge which would result in an excessive space between the bar and the mucosa.

5- A parallel or sloped anterior lingual alveolar contour in a distal extension removable partial denture where the bar may rotate into the tissues as the denture base moves toward the residual ridge.

2- Linguoplate (Lingual plate):



If the rectangular space bounded by the lingual bar, the anterior tooth contacts and cingula (continuous bar), and the bordering minor connectors is filled in, a Linguoplate results. The upper border should follow the natural curvature of the supracingular surfaces of the teeth and should not be located above the middle third of the lingual surface except to cover interproximal spaces to the contact points. The half-pear shape of

a lingual bar should still form the anterior border providing the greatest bulk and rigidity. All gingival cervices and deep embrasures must be blocked out parallel to the path of placement to avoid gingival irritation and any wedging effect between the teeth.

The Linguoplate does not in itself serve as indirect retainer. When indirect retention is required, definite rests must be provided for this purpose. Both the Linguoplate and the cingulum bar should ideally have a terminal rest at each end regardless of the need for indirect retention.

Indications:

1- When the lingual frenum is high or the space available for a lingual bar is limited

(less than 8 mm between the marginal gingival and the activated lingual frenum).

2- In those instances in which the residual ridges in Class I arch have undergone such vertical resorption (flat residual ridge) that they will offer only minimal resistance to horizontal rotations of the denture through its bases.

3- For stabilizing periodontally weakened teeth, splinting with a linguoplate can be of some value when used with definite rests on sound adjacent teeth. It will provide support to the prosthesis and to help resist horizontal rotation of the distal extension type of denture.

4- When the future replacement of one or more incisor teeth will be facilitated by the

addition of retention loops to an existing linguoplate.

5- Only few remaining anterior teeth which must be contacted to provide a reference for fitting the framework and indirect retention.

6- Undercut or parallel lingual alveolar ridge when the superior edge of a lingual bar cannot be located in close contact with the mucosa and still be at least 3 mm inferior to the marginal gingiva.

7- Distal extension removable partial dentures with parallel or sloped lingual alveolar ridges where a lingual bar would rotate into the ridge when the base area rotates tissue ward.

8- Mandibular tori or exostosis which must be covered by the removable partial denture because they cannot be surgically removed

or avoided in the removable partial denture design. Relief is provided between the torus or exostosis and the framework.

Contraindications:

- 1- When a lingual bar may be used.**
- 2- Overlapped anterior teeth where the undercuts in the area of the superior edge of the palate cannot be removed, frequently these criteria cannot be met and a linguoplate which will have small gaps between the superior edge of the palate and the teeth must be used.**
- 3- Lingually inclined teeth.**
- 4- Diastemas, unless the lingual plate can have slots in it to avoid the display of metal.**
- 5- Open cervical embrasures where the plate would be visible.**

Sometimes a dentist is faced with a clinical situation wherein a linguolate is indicated as the major connector of choice even though the anterior teeth are quite spaced; interrupted linguoplate can then be constructed so that the metal will not show through the spaced anterior teeth. Rigidity of the major connector is not greatly altered but such a design may cause food trapping.

3- Sublingual bar:



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 the superior border of the bar at least 4 mm below the free gingival margin. The shape of the sublingual bar remains essentially the same as that of a lingual bar, but 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:

1- The sublingual bar should be used for mandibular removable partial dentures where the height of the floor of the mouth in relation to the free gingival margins will be less than 6 mm.

2- It may also be indicated whenever it is desirable to keep the free gingival margins of the remaining anterior teeth exposed and these there is inadequate depth of the floor of the mouth to place a lingual bar.

3- In the presence of an anterior lingual undercut that would require considerable block out for a conventional lingual bar.

4- Bracing and indirect retention can be provided by clasps and indirect retainers and future addition of prosthetic teeth to the framework are not anticipated.

5- Distal extension removable partial denture situations with sloped or parallel lingual alveolar ridges where a lingual bar would rotate into the lingual alveolus as the base area rotates tissue ward.

6- Diastemas and open cervical embrasures of anterior teeth.

7- Overlapped anterior teeth.

8- Intolerance to other lingual major connector.

Contraindications:

1- Where a lingual bar or linguoplate will suffice.

2- Remaining natural anterior teeth severely tilted toward the lingual.

3- Interfering lingual tori.

4- High attachment of lingual frenum.

5- Interference with elevation of the floor of the mouth during functional movements.

6- Situations where bracing and/ or indirect retention must be provided by contact of major connector with teeth.

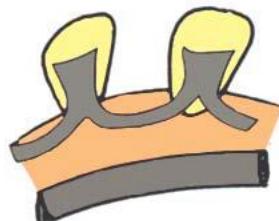
7- Situations where future additions of prosthetic teeth to the framework is anticipated.

4- Lingual bar with cingulum bar (Continuous bar):



A cingulum bar (continuous bar retainer) located on or slightly above the cingula of the anterior teeth may be added to the lingual bar for one reason or another. Cingulum bar conventionally shaped and

located same as lingual bar major connector component when possible. It is narrow (3 mm) metal strap located on cingula of anterior teeth, scalloped to follow interproximal embrasures with inferior and superior borders tapered to tooth surfaces. It originates bilaterally from incisal, lingual, or occlusal rests of adjacent principal abutments. It is an excellent indirect retainer contributes to great extent to the horizontal stability of the prosthesis with small amount of support through distributing the stresses to all teeth with which it comes into contact with, it may be modified in the presence of Diastemas.



Indications:

- 1- When a linguoplate is otherwise indicated but the axial alignment of anterior teeth is such that excessive block out of interproximal undercuts would be required.**
- 2- Situation where the major connector must contact the natural teeth to provide bracing and indirect retention and there are open cervical embrasures which contraindicates the use of a lingual plate.**
- 3- There must be adequate space for the lingual bar portion of the major connector.**

Contraindications:

- 1- Where a lingual bar or lingual plate will suffice.**
- 2- Any contraindication for a lingual bar.**

3- Any contraindication for a lingual plate except open cervical embrasures.

5- Cingulum bar (Continuous bar):



Indications:

1- When a lingual plate or sublingual bar is otherwise indicated but the axial alignment of the anterior teeth is such that the excessive block out of interproximal undercuts would be required.

2- Height of activated lingual frenum and floor of the mouth at the same level of marginal gingiva.

3- Inoperable tori or exostosis at the same level as the marginal gingiva.

4- Severely undercut lingual alveolus.

5- Concern that a major connector traversing the gingival sulcus will cause a periodontal problem.

6- Considerable gingival recession.

Contraindications:

1- Anterior teeth severely tilted to the lingual.

2- When wide diastema exists between the mandibular anterior teeth and the cingulum

bar would objectionably display metal in a frontal view.

6- Labial bar and buccal bar:



These bars are situated in the labial or buccal sulcus. Superior border located at least 4 mm inferior to labial and buccal gingival margins and more if possible. Inferior border located in the labial-buccal vestibule at the juncture of attached (immobile) and unattached (mobile) mucosa. It is always flatter and broader than the lingual bar and must be relieved in the canine

eminence area. This type of mandibular major connector used in few situations and it is the least one used as mandibular major connector.

Indications:

- 1- When lingual inclinations of remaining mandibular premolar and incisor teeth cannot be corrected, preventing the placement of a conventional lingual bar connector.**
- 2- When severe lingual tori cannot be removed and prevent the use of a lingual bar or a lingual plate major connector.**
- 3- When severe and abrupt lingual tissue undercuts make it impractical to use a lingual bar or lingual plate major connector.**

4- When an extremely abnormal high lingual frenum interferes with all other types of other usual mandibular major connector.

5- The patient cannot tolerate a lingual bar.

Contraindications:

1- When a lingual major connector may be used.

2- The facial tori or exostosis.

3- The facial alveolar ridge is undercut,

4- High facial muscle attachment which would result in less than 4 mm of space between the superior edge of the labial bar and the marginal gingiva of the teeth.

Hinged continuous labial bar:

A modification to the linguoplate is the hinged continuous labial bar. This concept is incorporated in the swing-lock design, which consists of a labial or buccal bar that is connected to the major connector by a hinge on one end and a latch on the other end.

Support is provided by multiple rests on the remaining natural teeth. Stabilization and reciprocation are provided by a linguoplate contacting the remaining teeth and are supplemented by the labial bar with its retentive struts. Retention is provided by a bar type of retentive clasp arms projecting from the labial or buccal bar and contacting the infrabulge areas on the labial surfaces of the teeth.

Indications:

**1- Missing key abutments (such as canine).
By using all the remaining teeth for retention and stability.**

2- Unfavourable tooth contours. When existing tooth contours (uncorrectable by re-contouring with appropriate restorations) or excessive labial inclinations of anterior teeth prevent conventional clasp designs.

3- Unfavourable soft tissue contours. Extensive soft tissue undercuts may prevent proper location of component parts of a conventional removable partial denture.

4- Teeth with questionable prognosis (because all of the remaining teeth function as abutments in the swing-lock denture).

Contraindications:

1- Poor oral hygiene and lack of patient motivation.

2- Shallow buccal or labial vestibule.

3- High frenal attachment (labial or buccal frenum).