Topics of Denture

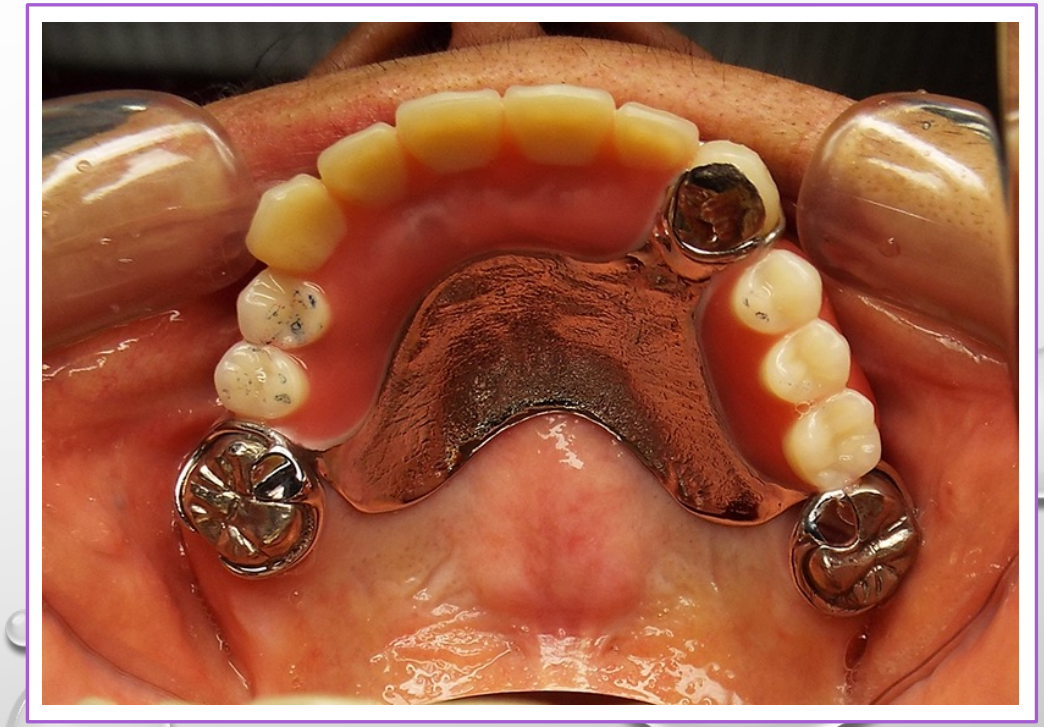
A. How to use the Perfect-STOX
B. Maxillary impression procedures
C. Mandibular impression procedures
D. Difficult case of complete denture
E. Placement of direct retainers and indirect retainer
F. Design of direct retainer
G. Design of indirect retainer
H. Preparation of abutment tooth
I. Design of major connector

Design of major connector

Contents

1. What is a major connector
2. 5 principles of a major connector
3. Types of major connector
    a) Palatal bar
    b) Anterior and posterior palatal bars
    c) Palatal plate
    d) Lingual bar
    e) Lingual plate
    f) U-shaped palatal major connector
    g) Kennedy bar

References

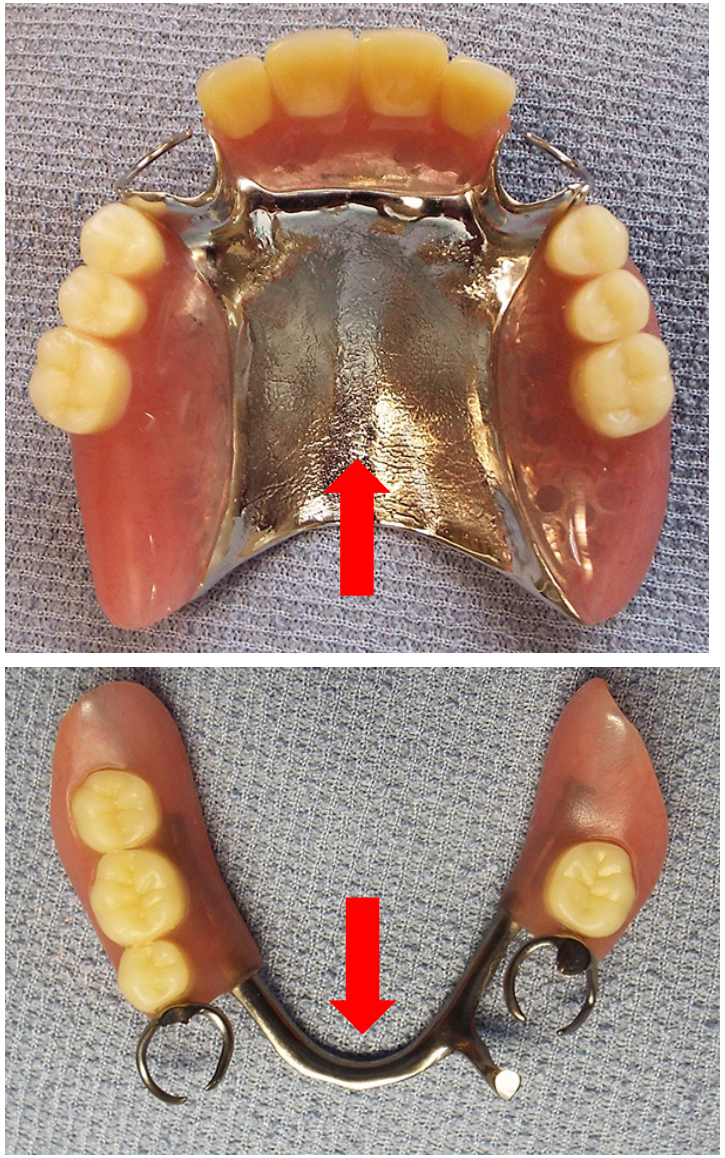


Design of major connector

1. What is a major connector

As shown in the right photo, the major connector is a component of a partial denture that serves to connect the base to the base or the base to a direct or indirect retainer. The major connector also transmits the force applied to each denture component and distributes the occlusal pressure applied to a part of the partial denture to the various tissues. Therefore, the major connector must be rigidly designed because it must not deform as a force transmitter. The rigid design of the major connector provides the following benefits:

1.Prevents uneven distribution of the burden on the underlying mucosa.
2.Stabilizes the denture during function.
3.Reduces the burden on the abutment teeth.



Design of major connector

2. 5 principles of a major connector

(1) A major connector is designed with the necessary width and thickness to provide rigid properties.
(2) Major connectors are designed to be as thin as possible and as wide as possible for the purpose of improving fit and to improve the wearing comfort.
(3) Where the major connector intersects the midline, the design should be such that the limb edge of the major connector intersects the midline at right angles.
(4) The distance between the major connector and the gingival margin of the remaining tooth should be as far apart as possible.
(5) The limb of the major connector should be drawn with a smooth curve.

Each of these principles will be explained.

Design of major connector

2. 5 principles of a major connector

(1) A major connector is designed with the necessary width and thickness to provide rigid properties.

Its thickness and width depend on the type and material of the major connector.

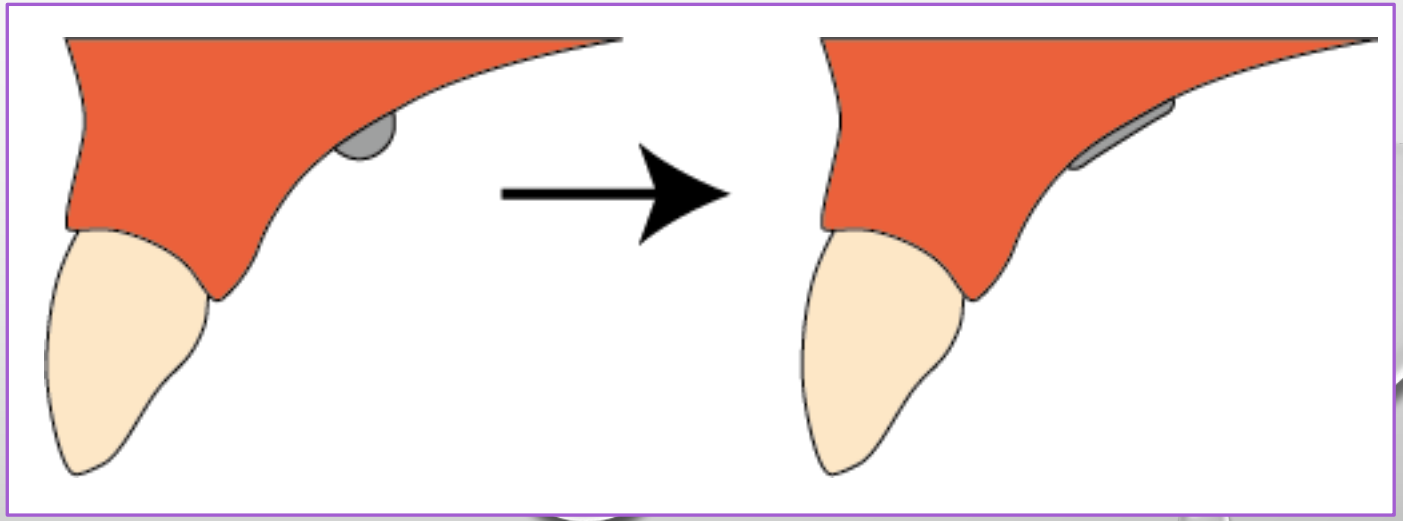
Recently, metal-free non-clasp dentures have been offered to patients. This partial denture cannot distribute the occlusal pressure to the remaining teeth or the jaw crest because it lacks rigidity. Therefore, prolonged use of this partial denture, often referred to as a "gum-stripper," can cause damage to the periodontal tissue of the remaining teeth and lead to partial resorption of the crest.

For these reasons, when recommending non-clasp dentures to patients, it is necessary to inform them about the potential adverse effects of long-term use.

Design of major connector

2. 5 principles of a major connector
(2) Major connectors are designed to be as thin as possible and as wide as possible for the purpose of improving fit and to improve the wearing comfort.

Discomfort can be reduced by designing major connectors that are wider and thinner.

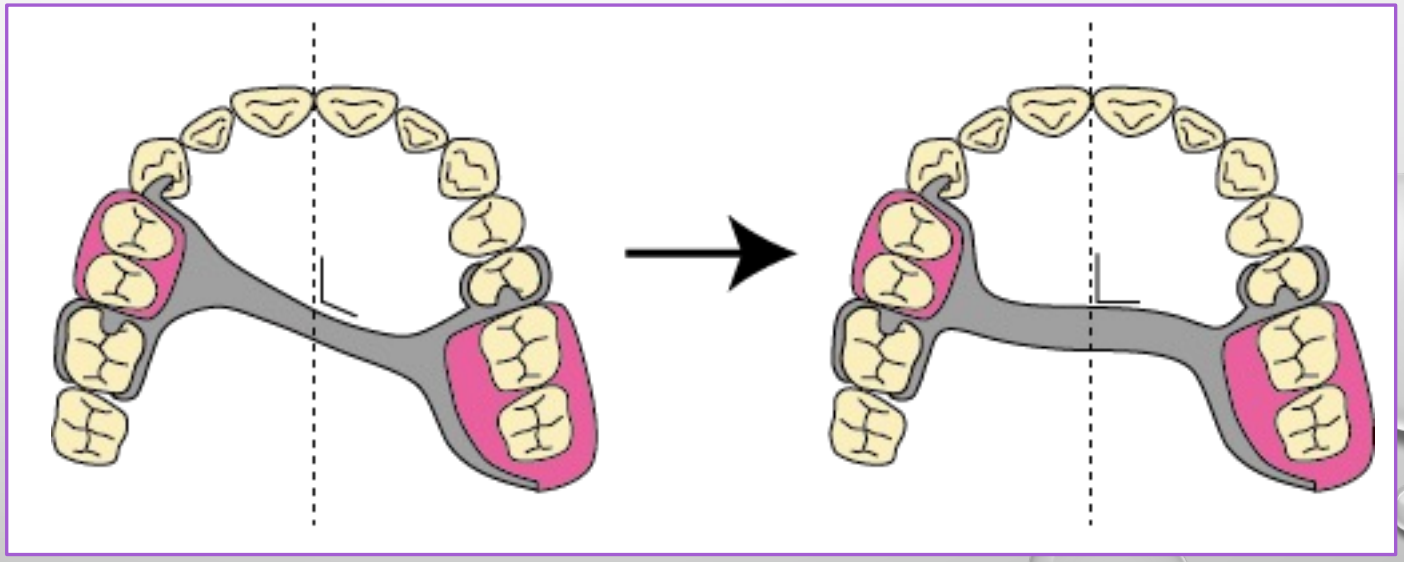


Design of major connector

2. 5 principles of a major connector

(3) Where the major connector intersects the midline, the design should be such that the limb edge of the major connector intersects the midline at right angles.

As shown in the lower illustration(on the left), a coupling that crosses diagonally across the median is not good for the feel of the tongue, so it should be designed to cross at a right angle as shown on the right.

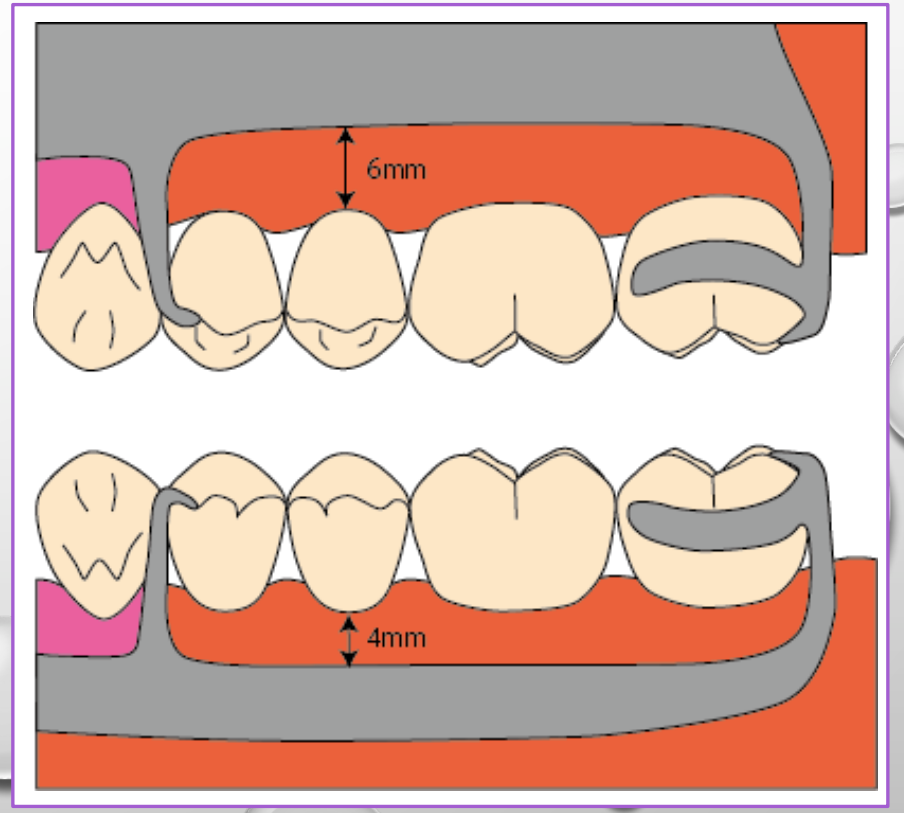


Design of major connector

2. 5 principles of a major connector

(4) The distance between the major connector and the gingival margin of the remaining tooth should be as large as possible.

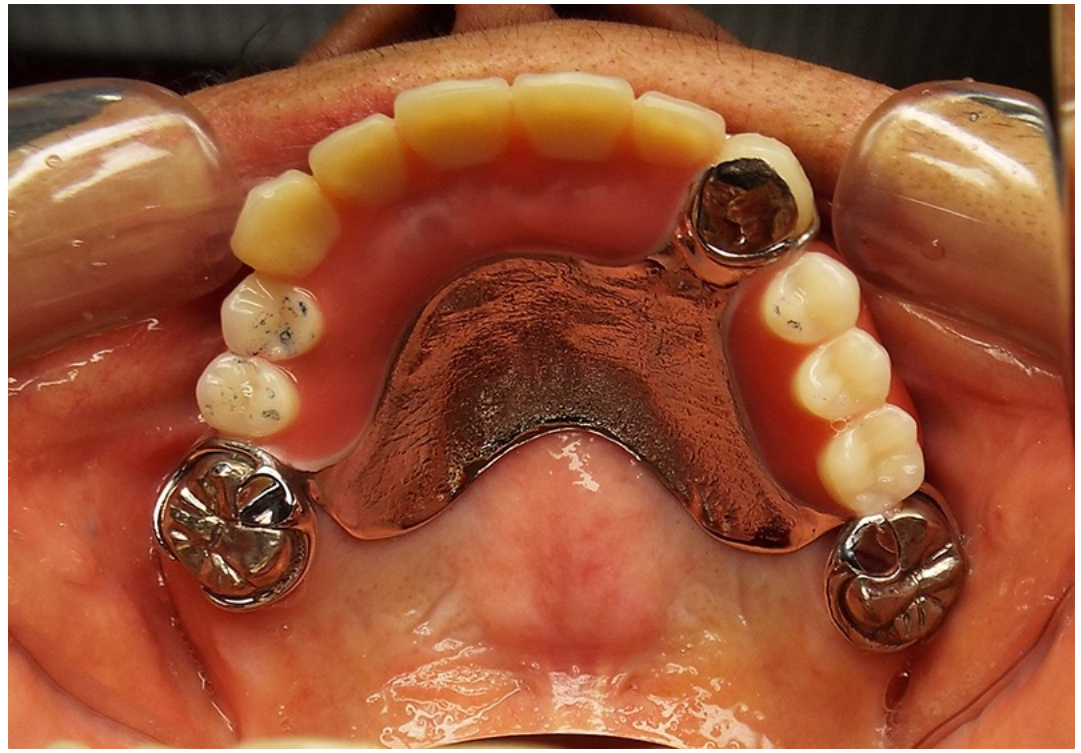
Generally, as shown in the right illustration, it is considered that a distance of at least 6 mm should be secured in the maxilla and 4 mm in the mandible. If these distances cannot be secured, the major articulator should be designed to cover the gingival margin.



Design of major connector

2. 5 principles of a major connector
(5) The limb of the major connector should be drawn with a smooth curve.

Smoothing all edges of the major connector allows for a more comfortable denture.



Design of major connector

3. Types of major connector

The following types of major connectors are selected according to oral conditions

a) Palatal bar
b) Anterior and posterior palatal bars
c) Palatal plate
d) Lingual bar
e) Lingual plate
f) U-shaped palatal major connector
g) Kennedy bar

Each of these will be explained.

Design of major connector

3. Types of major connector

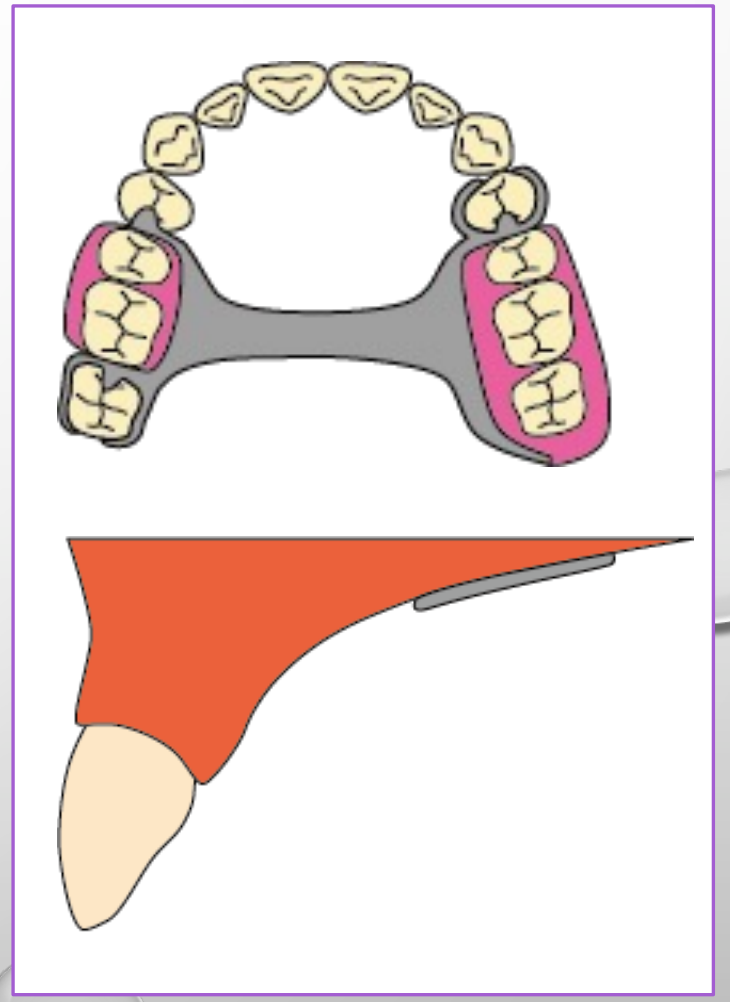
a) Palatal bar

The palatal bar is the best and preferred choice of a major connector for maxillary partial dentures. As shown in the right illustration, the palatal bar is designed to cross the center of the palate. It is meant to be thin to reduce discomfort, so it must have a certain width (10 mm or more).

The palatal bar is set in the center of the palate because the anterior part of the palate is the area where the tongue comes into contact during pronunciation, and the posterior part of the palate is the area that can trigger vomiting, with the center causing the least discomfort.

Paratarsal bars do not require relief, except in the area of the palatal ridge and palatal median suture line.

The cross-sectional shape of the palatal bar should be "flat" or "banded" rather than semi-oval.



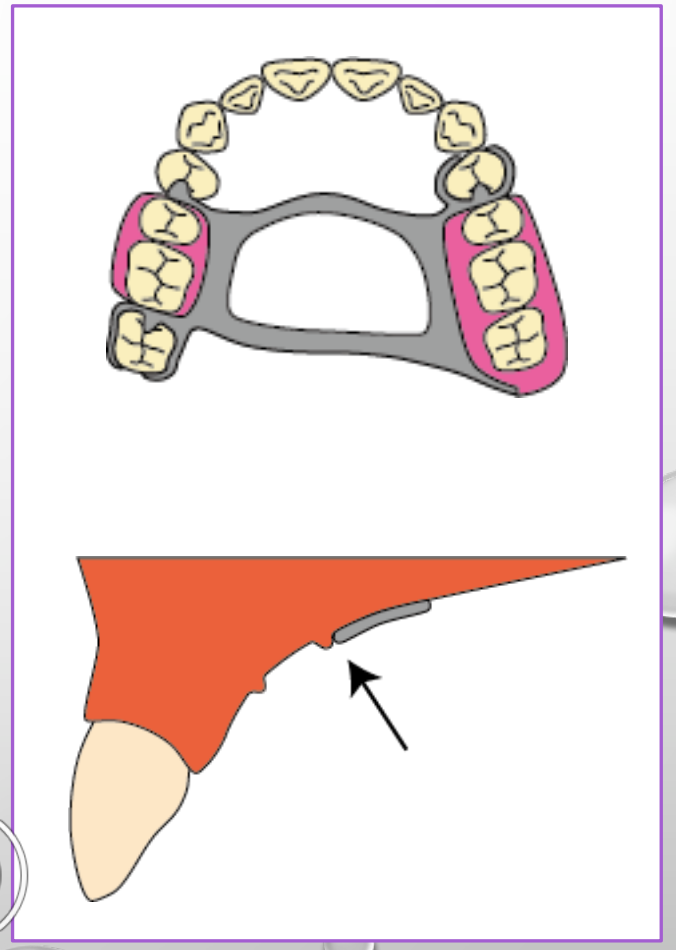
Design of major connector

3. Types of major connector

b) Anterior and posterior palatal bars

The anterior-posterior palatal bar is a major connector used in the maxilla and is selected for cases where a palatal bar cannot be designed due to the presence of a bony prominence in the center of the palate. The anterior-posterior palatal bar is superior to the palatal bar in that it can be designed more rigidly, but it is inferior in terms of fit.

As shown in the upper right illustration, the design consists of two anterior and posterior palatal bars that avoid the palatal ridge. In the lower right illustration, the anterior edge of the anterior bar aligns with the palatal ridge to reduce the step between the palatal mucosa and the bar surface, thereby decreasing discomfort. The posterior edge of the posterior bar is designed in the same way as the posterior edge of a full denture.

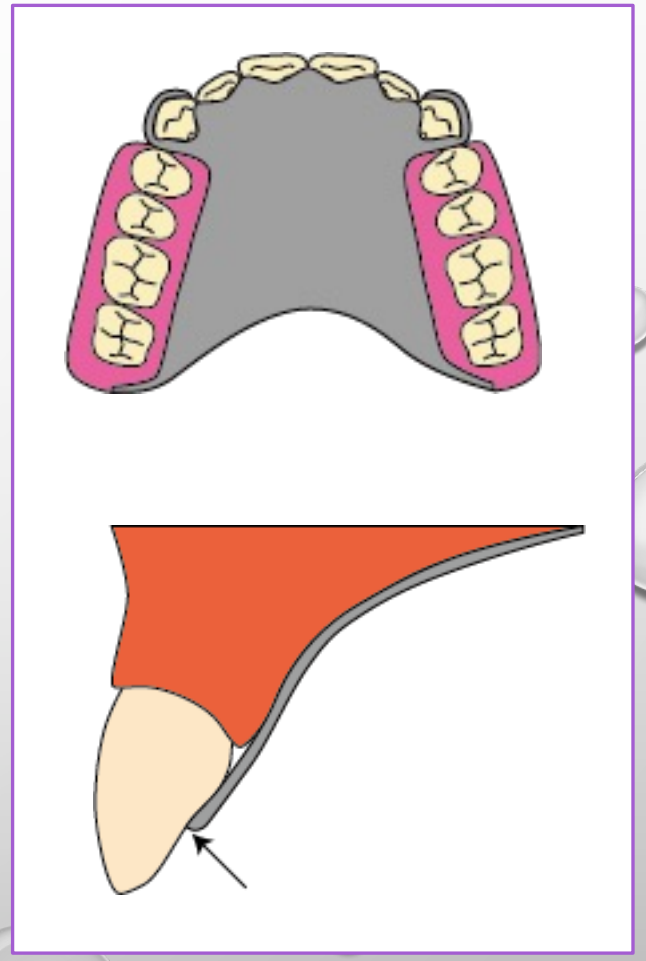


Design of major connector

3. Types of major connector

c) Palatal plate

As shown in the upper right illustration, the palatal plate is a major connector that covers the entire palatal surface. Bilateral distal extension dentures with a large number of missing molars are difficult to set up with appropriate indirect maintenance devices. In such cases, an indirect retainer is sought on the lingual surfaces of the anterior teeth, for which palatal plates are designed. Palatal plates are also the choice for partial dentures with bilateral distal extension and missing anterior teeth. In such cases, the anterior edge of the palatal plate that contacts the lingual aspect of the anterior teeth should be set 1/3 to 1/2 from the incisal edge, as indicated by the arrow in the lower right illustration.



Design of major connector

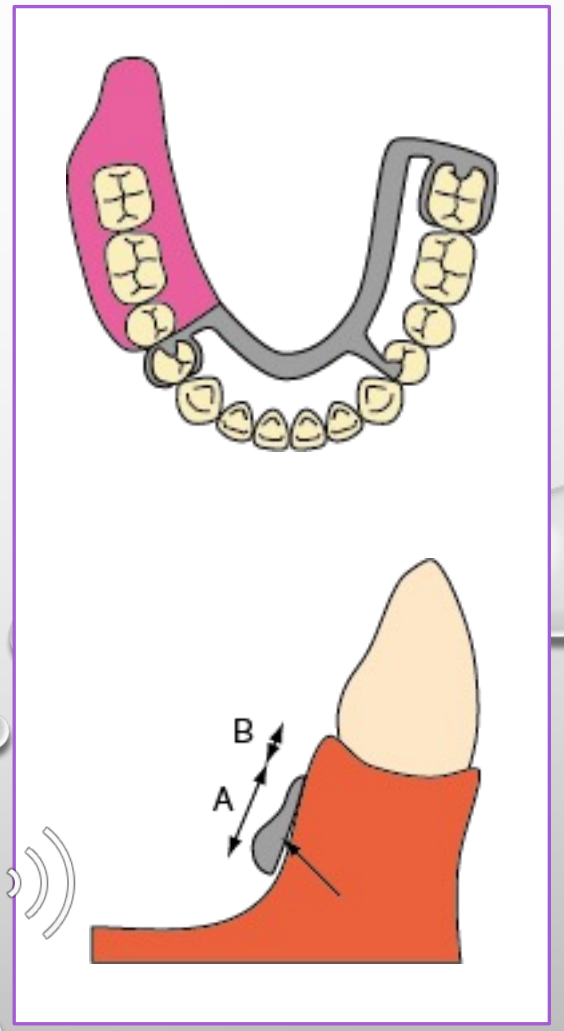
3. Types of major connector

d）Lingual bar

The lingual bar shown in the upper right illustration is the most superior major connector option in the mandible and is the preferred choice.

As depicted in the lower right illustration, the width (A) of the lingual bar is usually 4 to 5 mm, and its thickness is 2 to 2.5 mm. The upper edge of the bar should be at least 3 mm (B) away from the gingival margin. Consequently, if the distance from the gingival margin to the floor of the mouth is within 7 to 8 mm, the lingual bar cannot be used. In such cases, a lingual plate should be selected instead.

The cross-sectional shape of the lingual bar, as shown in the lower right illustration, is semi-pear-shaped, with the upper edge in contact with the mucous membrane surface to prevent the entry of food particles under pressure. The rest of the upper edge has a slight relief to avoid pressure and damage to the mucosa caused by the lingual bar when the denture is seated.

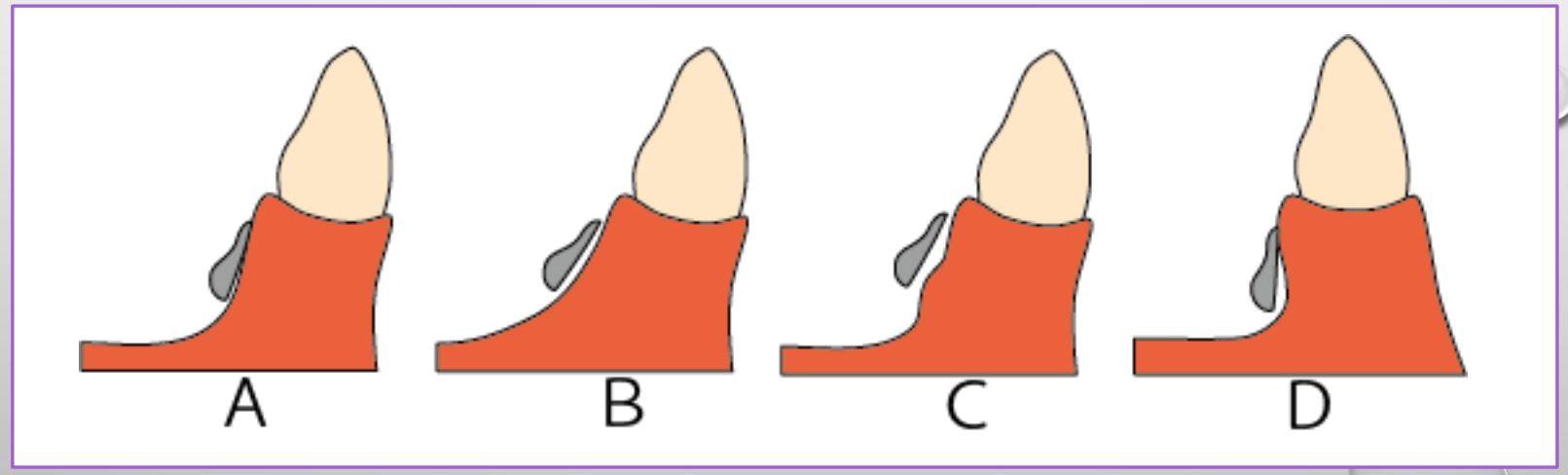


Design of major connector

3. Types of major connector

d) Lingual bar

Lingual bars are fabricated with the appropriate relief for each situation to avoid damage to the lingual mucosa surface when partial dentures are subjected to occlusal pressure. As shown in the lower illustration: (A) For a teeth-support denture, the relief should be slight. (B) If the lingual surface of the mucosa is gently sloping toward the floor of the mouth, more relief is usually required. (C) If mandibular ridges are present, relief should be sufficient so as not to irritate the thin mucosa covering these ridges. (D) If undercuts are present in the lingual soft tissue, block out only the undercut areas.



Design of major connector

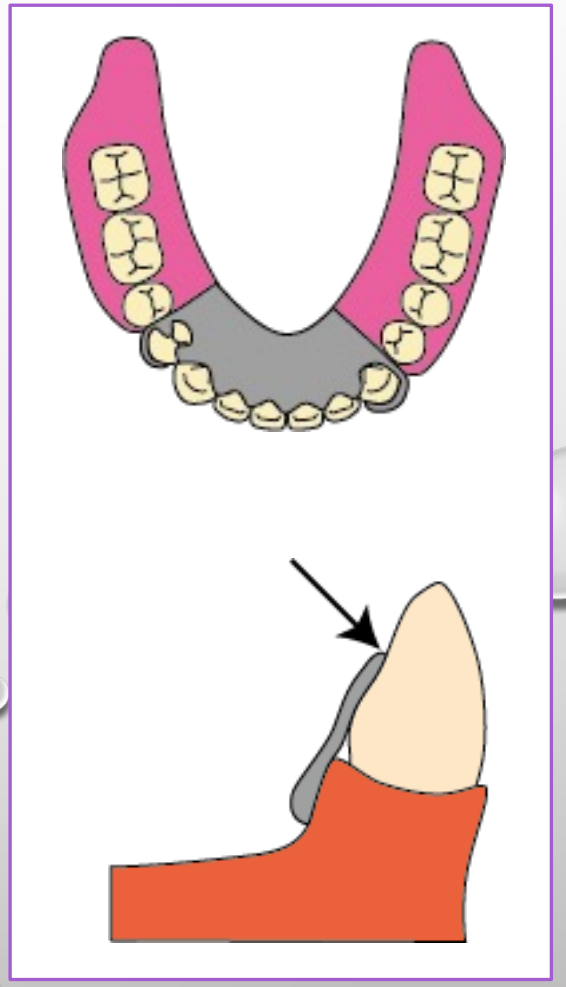
3. Types of major connector

e) Lingual plate

As shown in the upper right illustration, the lingual plate is a major connector used in the mandible and is selected for partial dentures that require an indirect retainer on the lingual aspect of the anterior teeth. The lingual plate is also selected when the distance from the anterior lingual cervix to the floor of the mouth is insufficient to design a rigid bar.

As shown in the lower right illustration, the lower edge of the bar should be set in a position that does not obstruct the floor of the mouth or lingual band. If bilateral first premolars remain, a proximal rest (terminal rest) integrated with the lingual plate should be set.

The upper edge of the lingual plate, indicated by the arrow in the lower right illustration, should be set 1/3 to 1/2 from the incisal edge of the anterior lingual surface.

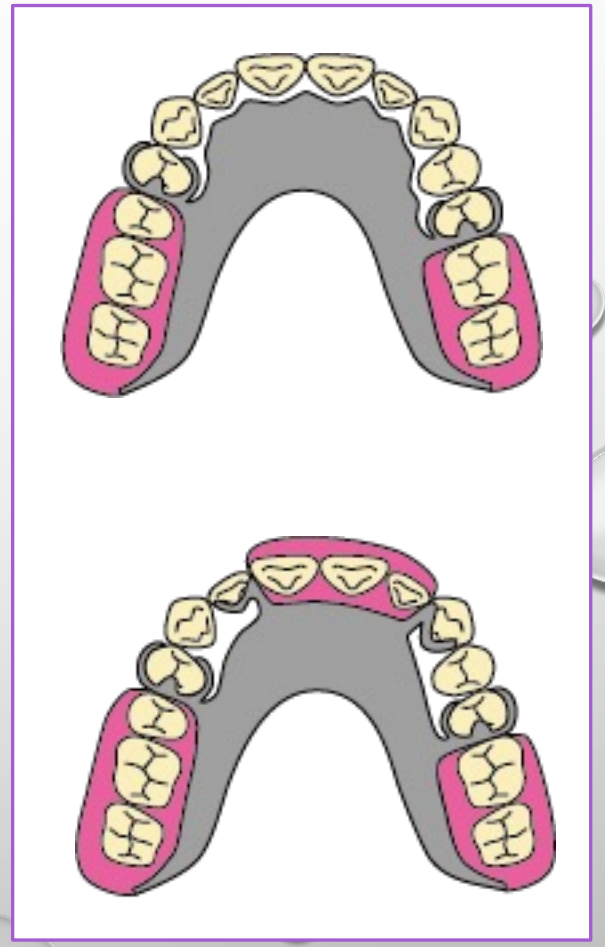


Design of major connector

3. Types of major connector

f) U-shaped palatal major connector

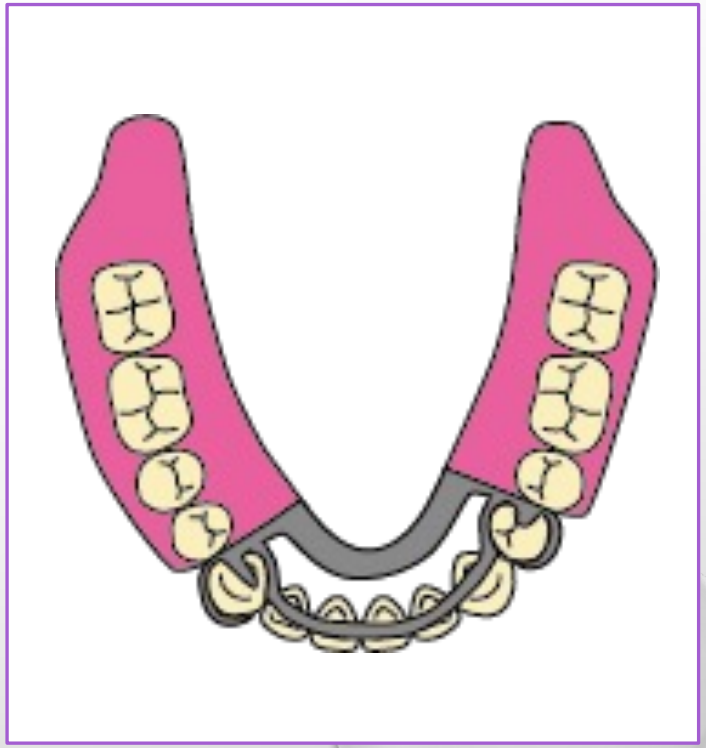
The U-shaped palatal major connector shown in the upper right illustration is difficult to design rigidly and is not often chosen. Due to its deformability, it can easily damage the alveolar ridge, and bringing the anterior edge of the bar closer to the residual cervix in order to allow the indirect retainer function may cause damage to the periodontal tissues of the remaining teeth. However, it may be used when a large palatal ridge is present that precludes surgery and when two or three missing teeth are present in the anterior region, as shown in the lower right illustration.



Design of major connector

3. Types of major connector
   g) Kennedy bar

The Kennedy bar shown in the illustration on the right is one of a series of retainers, also called a double lingual bar, which is a major connector with clasp arms running in a wavy pattern over the basal tuberosity. It is used in conjunction with the lingual bar and is also effective as an indirect retainer. However, it is rarely selected because of its inferiority to lingual plates in terms of tongue feel.



Design of major connector

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Thank you for your attention.