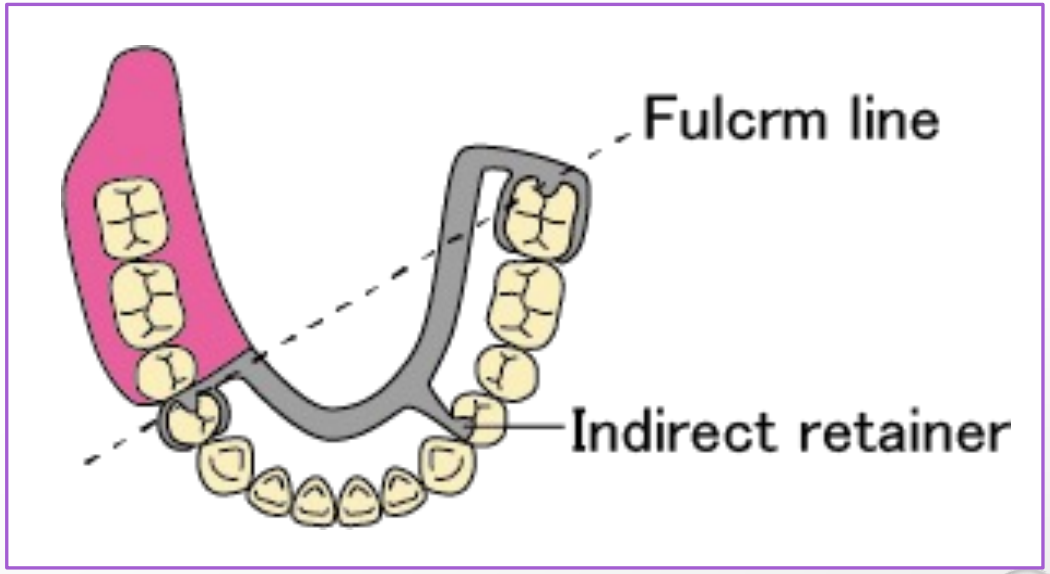
Topics of Denture



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 indirect retainer

Contents

1. What is an indirect retainer
2. Mechanism of indirect retainer
3. Setting of indirect retainer
4. Types and designs of indirect retainer
    a) occlusal rest
    b) lingual rest
    c) incisal rest
    d) ledge
    e) palatal plate
    f) lingual plate

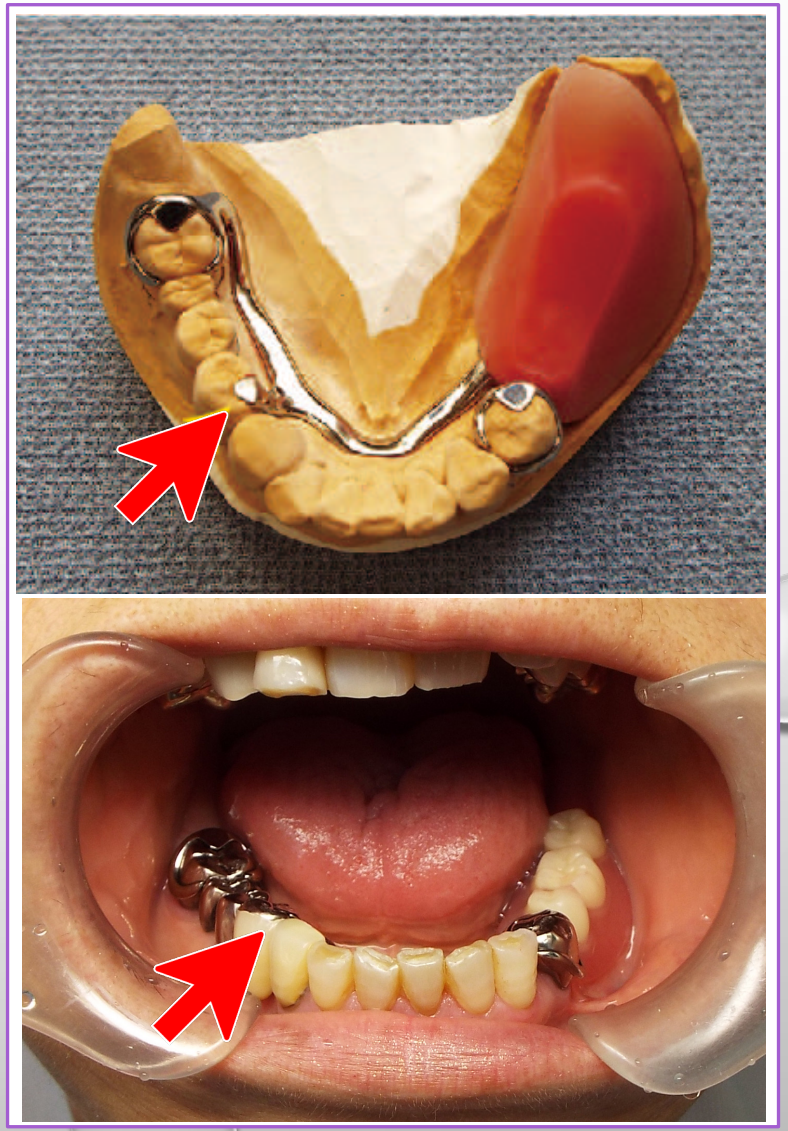
References

Design of indirect retainer

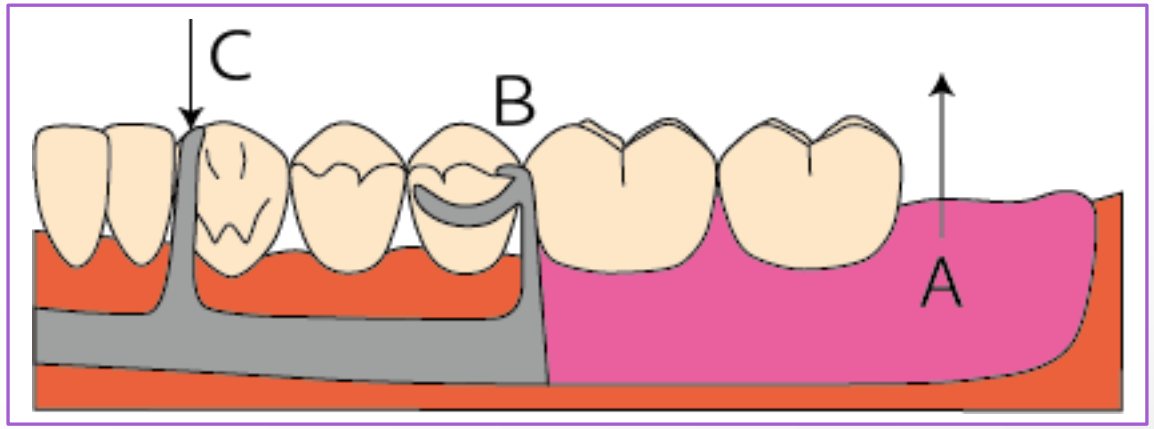
1. What is an indirect retainer

As shown by the red arrow in the photo on the right, indirect retainers are components of partial dentures that are set indirectly to prevent the distal extension denture base from lifting.

Indirect retainers are always placed on partial dentures in Kennedy Class I with no modification and Kennedy Class II classification with no modification.



Design of indirect retainer



2. Mechanism of indirect retainer

This article explains how an indirect retainer exerts retentive force in a distal extension denture. In the upper right figure, when a lifting force is applied to the distal extension denture base (A), the denture base rotates about the adjacent direct retainer (B). Consequently, the major connector sinks more than the rest, leading to the bar sinking more proximally. The purpose of the indirect retainer (C) is to prevent this sinking of the major connector.

At this point, the fulcrum shifts from the rest of the direct retainer to the indirect retainer, and the tip of the retention arm of the direct retainer exerts a retention force that resists the lifting of the denture base. Therefore, the indirect retainer should be positioned as far away from the tip of the retention arm as possible to ensure proper retention effectiveness.

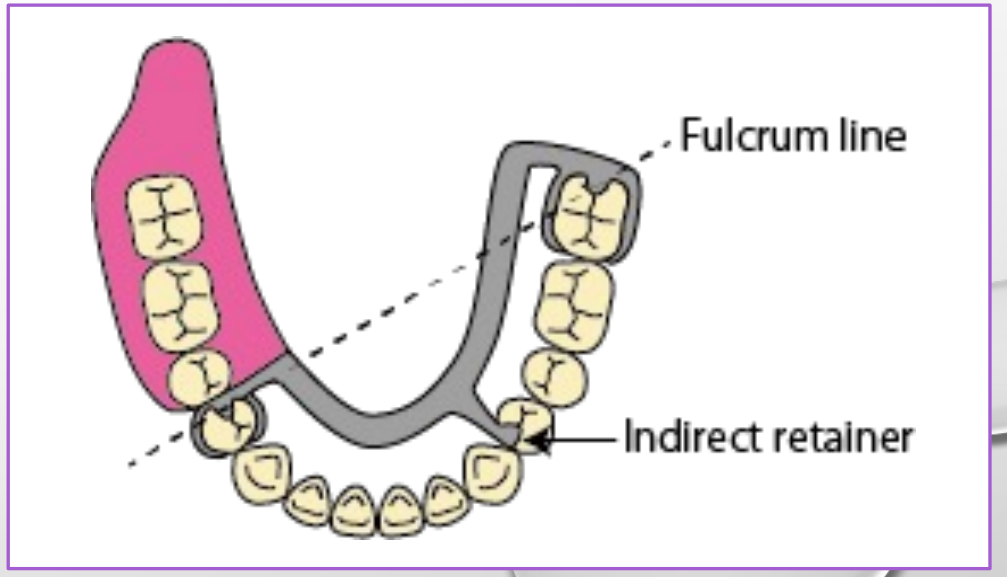
Visually, indirect retainers appear similar to occlusal and incisal rests. However, while occlusal surface rests must be designed to be robust to transmit strong occlusal pressure to the anchor teeth, indirect retainers only exert retention force on the denture base, so they do not require the same level of robustness. Nevertheless, it is still necessary to design the partial denture to prevent deformation during daily use.

Design of indirect retainer

3. Setting of indirect retainer

When the denture base is subjected to a lifting force, the denture rotates about the fulcrum line. To prevent rotation of the denture, the indirect retainer should be set as far away from the fulcrum line as possible, as shown in the upper right figure.

The indirect retainer is usually placed at the proximal marginal ridge of the first premolar. If an appropriate position cannot be found for setting an indirect retainer, the lingual or palatal mucosa of the anterior teeth may be used.



Design of indirect retainer

4. Types and designs of indirect retainer

There are different types of indirect retainers, depending on the situation in which they are set up, as shown below.

a) Occlusal rest
b) Lingual rest
c) Incisal rest
d) Ledge
e) Palatal plate
f) Lingual plate

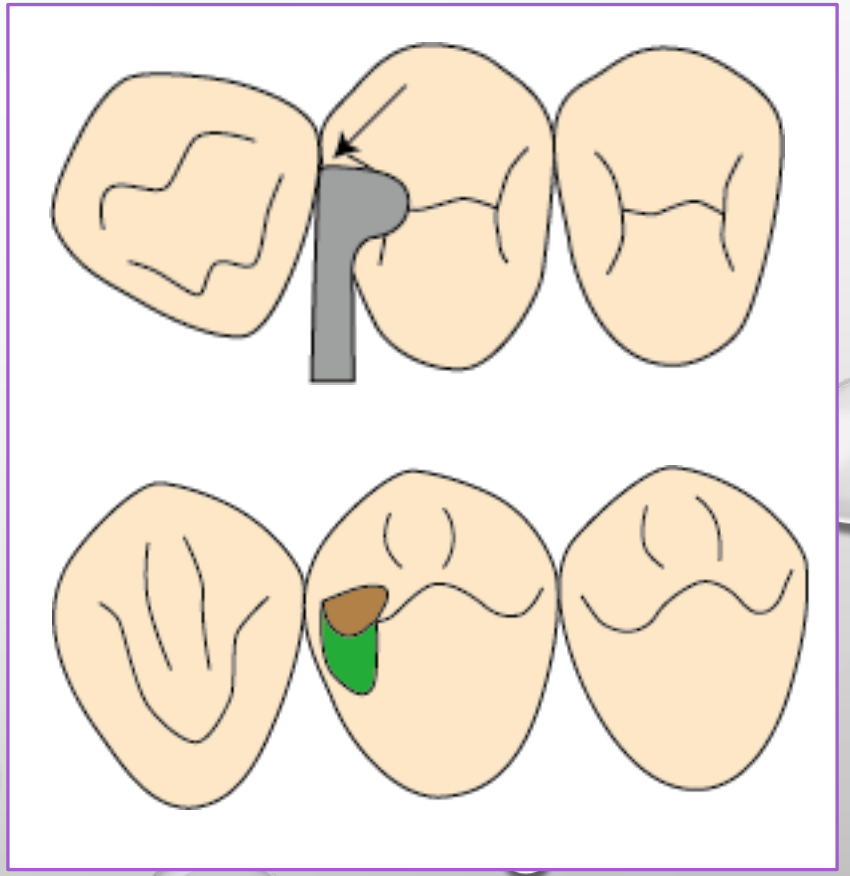
Each of these will be explained.

Design of indirect retainer

4. Types and designs of indirect retainer
   a) Occlusal rest

The most commonly set up indirect retainer is the occlusal rest at the proximal marginal ridge of the first premolar, as shown in the upper right figure. The design of this indirect retainer is the same as a regular occlusal rest. However, since there is no arm in the buccal direction, there is no need to open the rest fossa outward to the buccal direction of the tooth surface, as indicated in the arrow section.

As the lower figure illustrates, the guiding plane (green) is formed on the proximal surface of the first premolar. This guiding plane is in contact with the guiding surface of the minor connector.

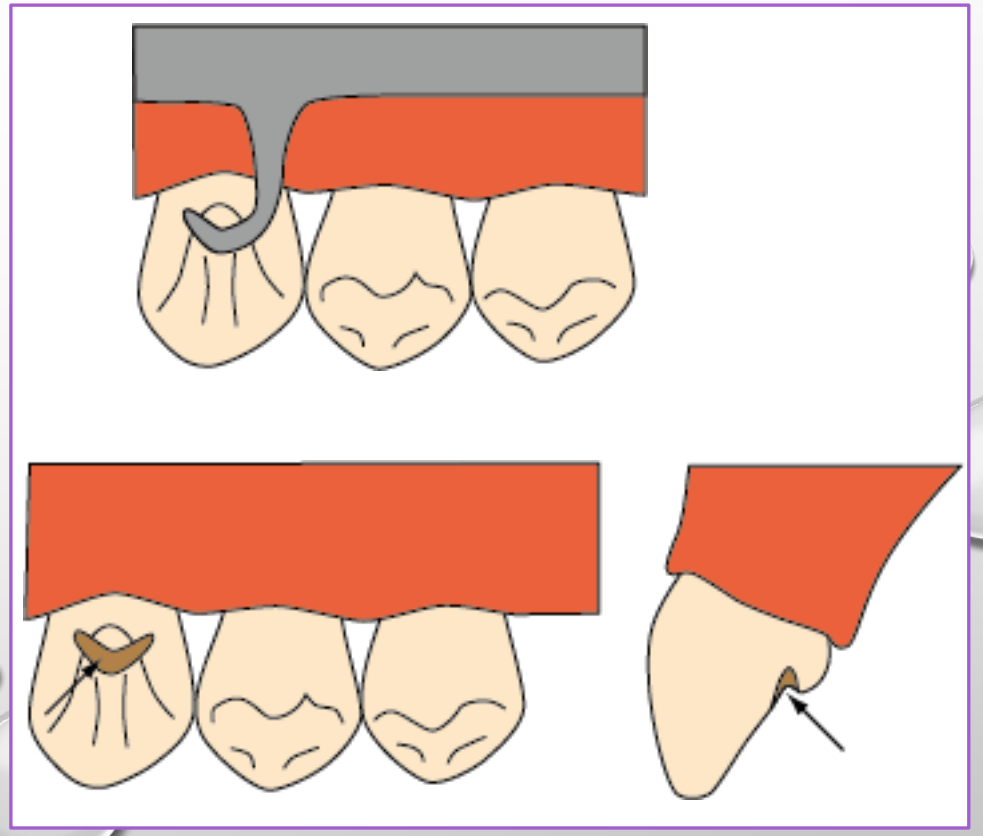


Design of indirect retainer

4. Types and designs of indirect retainer
   b) lingual rest

As shown in the upper right figure, the lingual rest may be set as an indirect retainer. The tooth to which a lingual rest may be placed is limited to the maxillary canines. The rest seat of the lingual rest is formed by making a V-shaped grinding on the lingual side of the basal tubercle, as shown in the lower right figure.

The lingual rest is said to have a less adverse effect on the abutment tooth because the point of action is located near the center of the abutment tooth. They are also highly aesthetic since no metal touches the exterior.



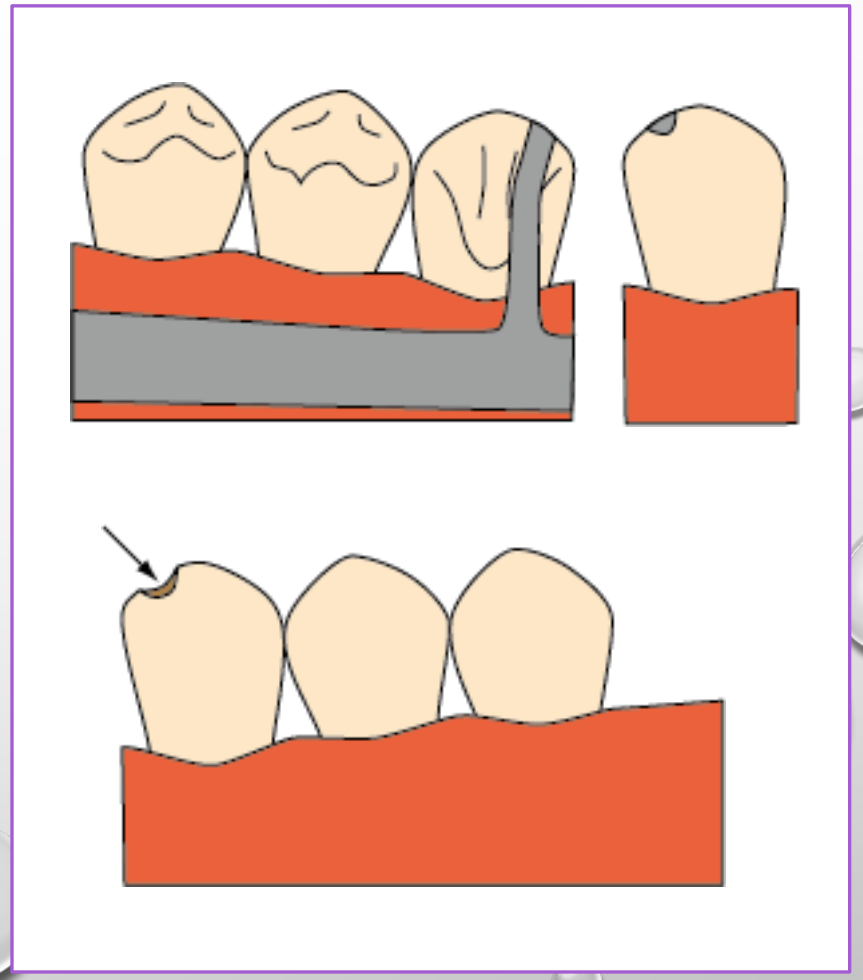
Design of indirect retainer

4. Types and designs of indirect retainer

c) incisal rest

As shown in the upper right figure, an incisal rest is sometimes designed as an indirect retainer and is primarily set on the mandibular canine tooth. The rest seat of the incisal rest is formed by placing a smooth, curved incisal surface at the proximal incisal edge, as shown in the lower right figure.

The incisal rest has the advantage of requiring less removal of tooth structure. However, it is considered to be less esthetic because a portion of the metal touches the exterior.



Design of indirect retainer

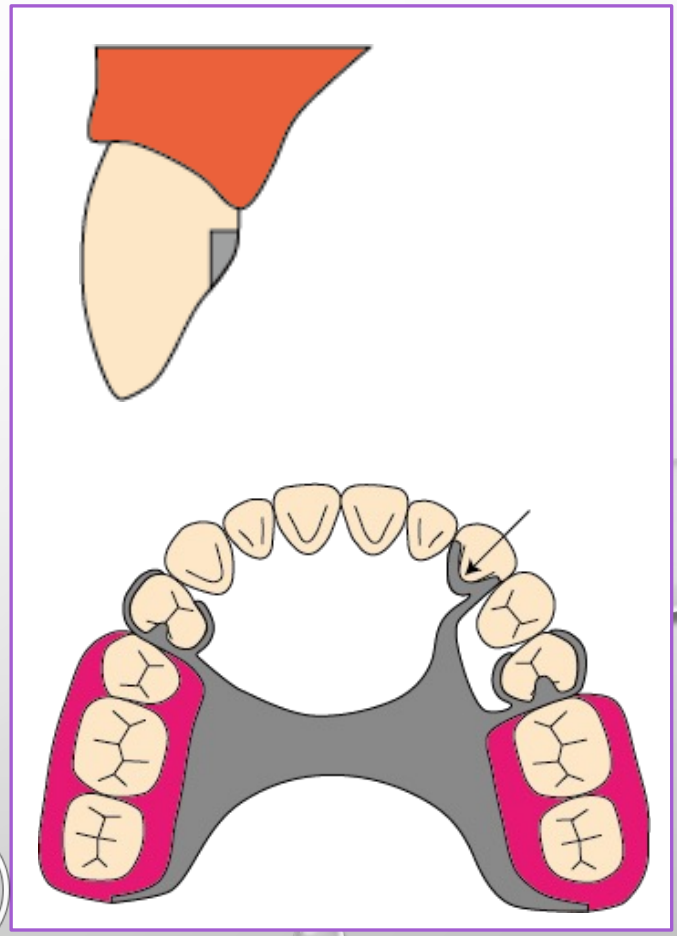
4. Types and designs of indirect retainer

d) Ledge

Ledges are suitable as indirect retainers because of their superior ability to properly control the direction of attachment and removal, preventing the bar from sinking. Additionally, since the ledge does not touch the exterior, dentures with excellent aesthetics can be designed.

The ledge is usually set on the canine, as shown in the upper right figure. The wall of the rest seat is aligned with the direction of attachment and removal, and the base of the rest seat is perpendicular to the wall. The entire rest seat is grooved over the lingual aspect, allowing the ledge to be armed, as indicated by the arrow in the lower right figure. Ledges take the same form as natural teeth when the denture is set, minimizing discomfort caused by the tongue.

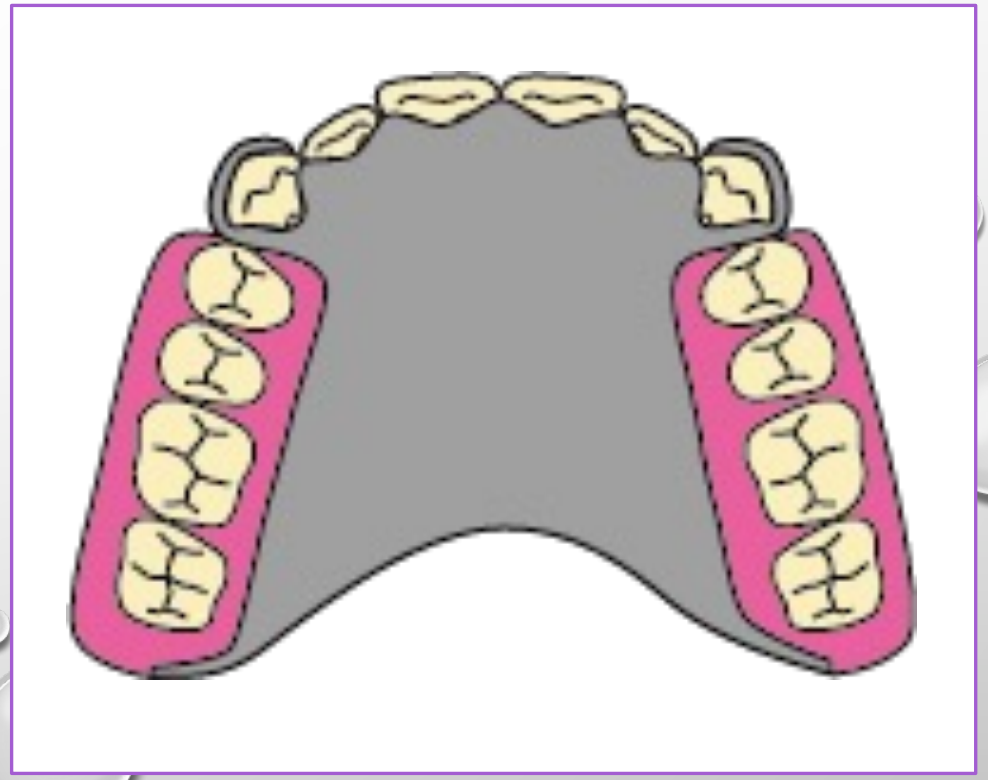
However, a disadvantage of the ledge is that it cannot be set on a natural tooth due to the large amount of grafted tooth that must be removed. Even in the case of crown restorations on pulpless teeth, special care is required in the formation of the crown abutment because of the need for a larger than usual space between the crown and the adjacent tooth.



Design of indirect retainer

4. Types and designs of indirect retainer
   e) palatal plate

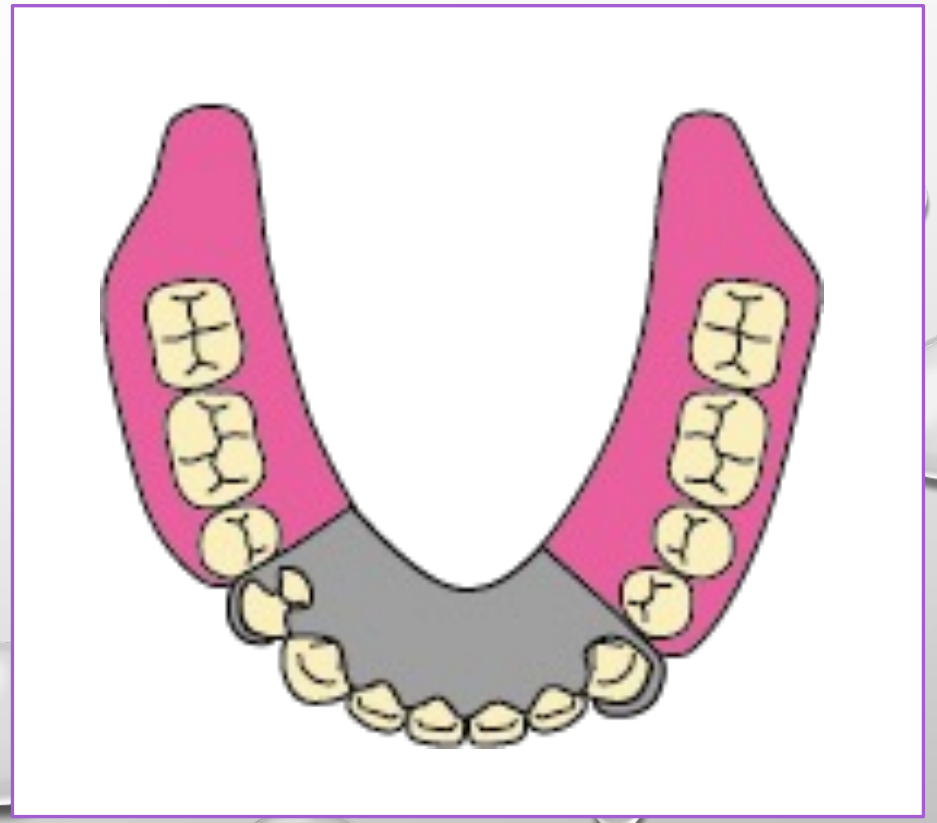
Bilateral distal extension dentures with a large number of missing maxillary molars make it difficult to set up an appropriate indirect retainer. In such cases, the palatal plate shown on the right is used as an indirect retainer. The design of this indirect retainer is the same as the palatal plate of the major connector.



Design of indirect retainer

4. Types and designs of indirect retainer
   f) lingual plate

Bilateral distal extension dentures with a large number of missing mandibular molars make it difficult to set up an appropriate indirect retainer. In such cases, a lingual plate is used as an indirect retainer, as shown in the figure on the right. The design of this indirect retainer is the same as the lingual plate of the major connector.



Design of indirect retainer

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If you have any questions or doubts, please leave them in the public comment section below.

The next topic will be the eighth, " Preparation of abutment tooth ".