Indirect retainer lect 11 Ashur university college

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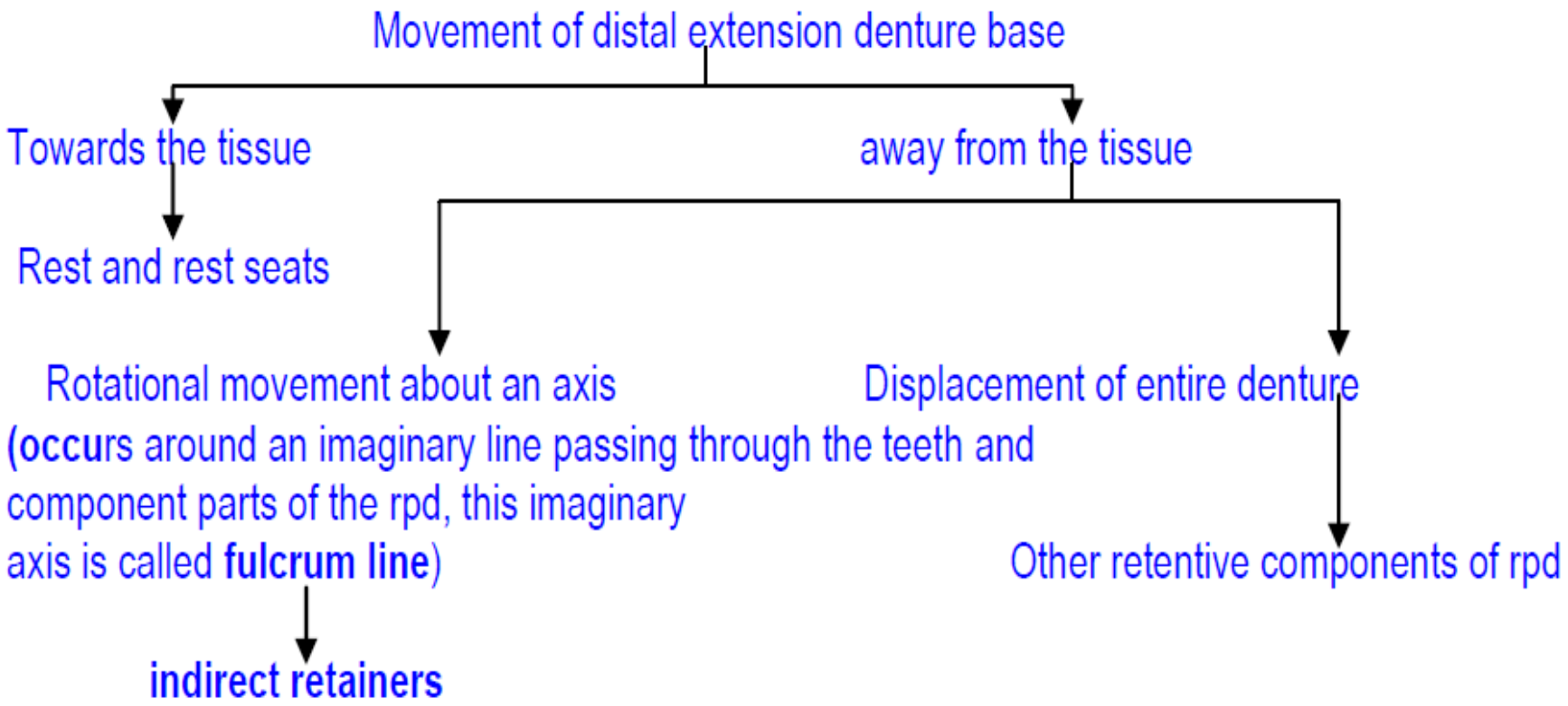
Vertical Movement of distal extension partial denture

Vertical movements of distal extension bases can occur in two directions.

1. **Movement of a distal extension base toward the ridge tissues will be proportionate to the displaceability of those tissues, the fit of the denture base and the load applied.**

2. **Movement of a distal extension base away from the ridge tissues will occur via either displacement of the entire denture (resisted by the direct retainers), or a rotational movement about an axis. This axis passes through rests of the most posterior abutment teeth and is called the (fulcrum line)**

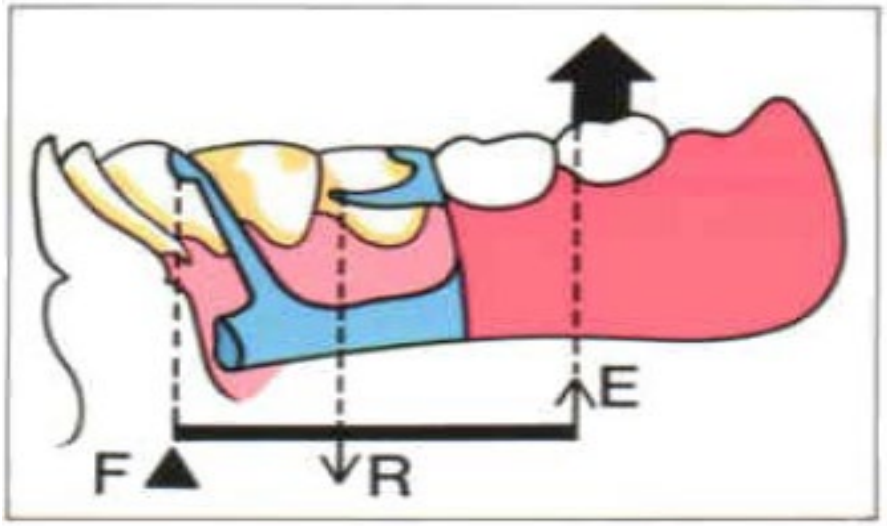
MODE OF ACTION OF INDIRECT RETAINERS

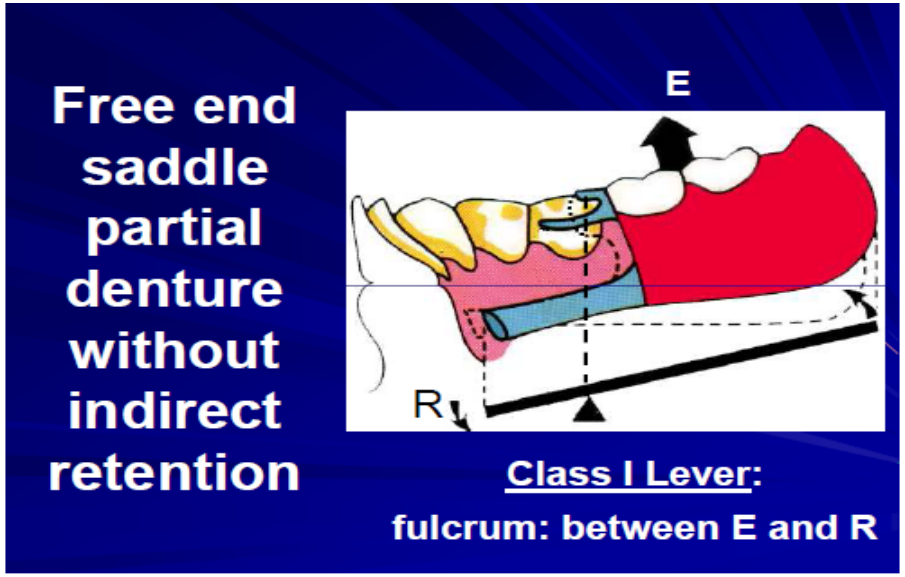


Indirect retainer

When an individual wearing R. P. D chews a piece of sticky food ,there is a tendency for the P.D to be displaced vertically away from the supporting tissue .

If there is no sufficient retention on the abutment .teeth the denture is dislodged



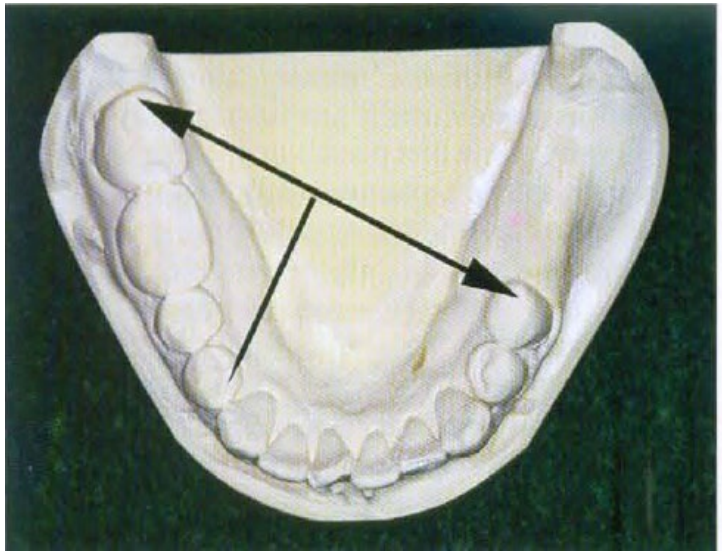


INDIRECT RETAINER

Definition: “The component of a removable partial denture that assists the direct retainer in preventing displacement of the distal extension denture base by functioning through lever action on the side opposite of the fulcrum line when the denture base moves away from the tissues in pure rotation around the fulcrum line.”

FULCRUM LINE: An imaginary line, connecting the most distal occlusal rests, around which a removable partial denture tends to rotate under masticatory forces.

Indirect retainers should be placed as far as possible from the distal extension base so as to gain the best possible leverage advantage against lifting of the distal extension base.



Location of indirect retainer

Although, the most effective location of an indirect retainer is frequently in the vicinity of an incisor tooth, these teeth may not be strong enough to support an indirect retainer. In addition, incisors often have steep lingual inclines that cannot be favorably altered to support a rest. In such cases, **the nearest canine tooth or the mesial-occlusal surface of the first premolar may be the best location,** despite the fact that it is not as far removed from the fulcrum line.

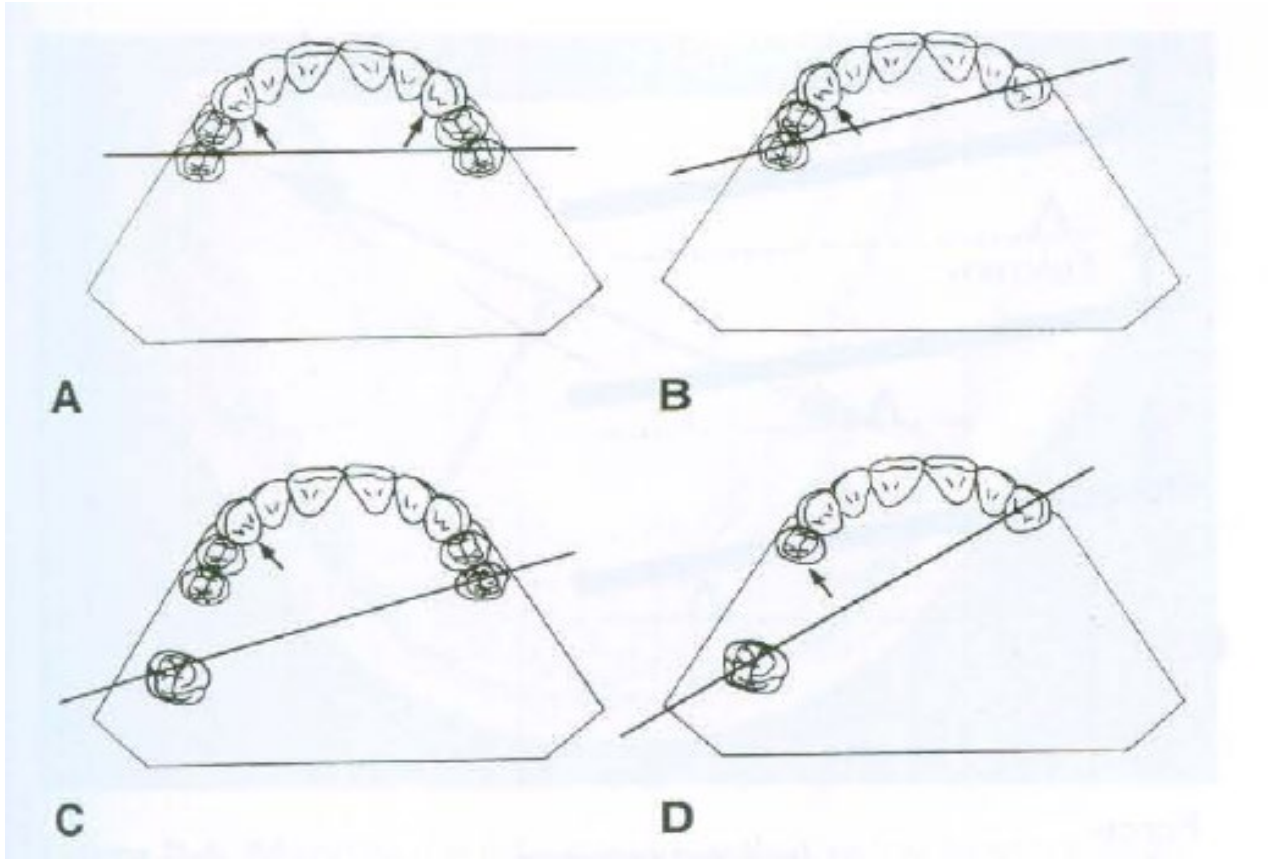
Location of fulcrum lines for different classes of RPDs

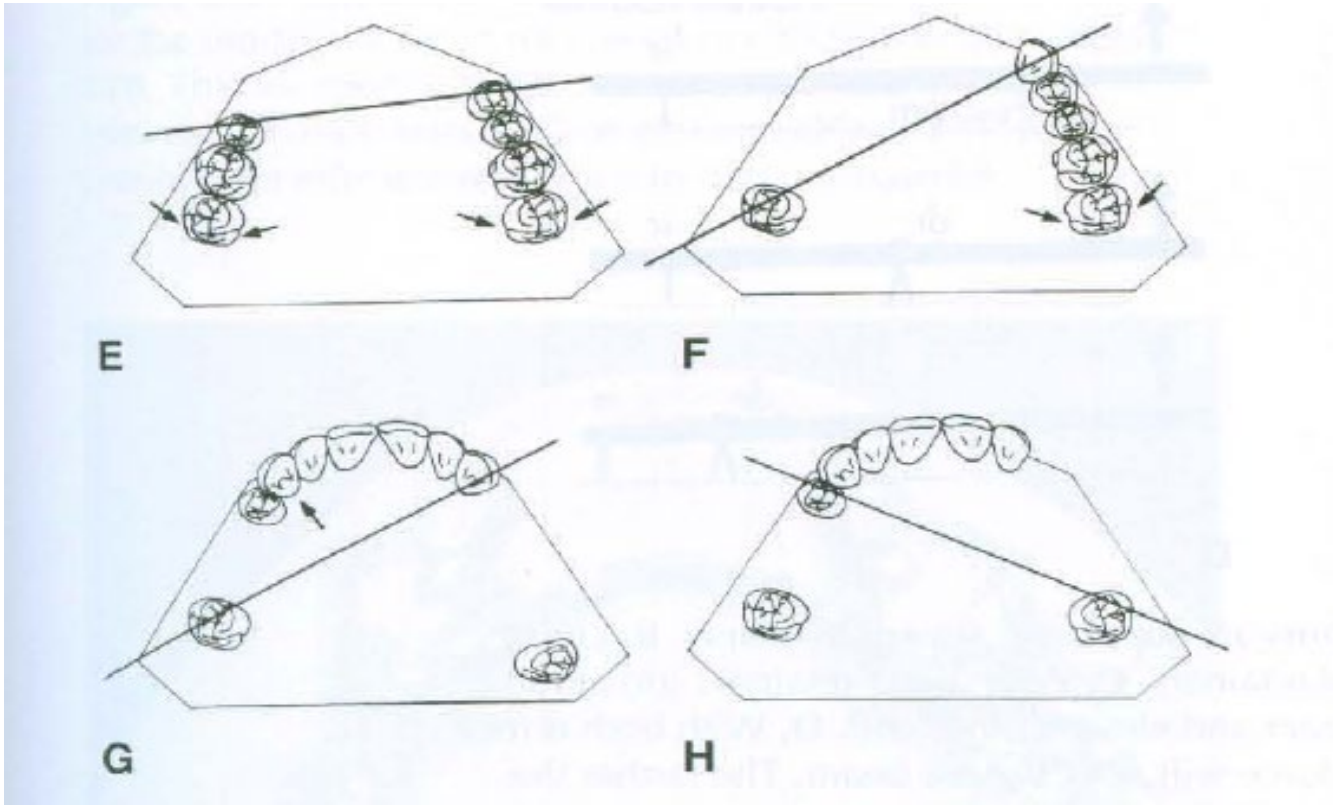
1)Class1-passes through most posterior abutments

2) Class2-passes diagonally through most posterior teeth on one side and abutment on distal extention side

3) Class3-passes through two principal abutments

4)Class4-passes through two abutments adjacent to the edentulous space





Effectiveness and Placement:

- Usually it is a rest seat placed anterior the the fulcrum line on the side opposite the extension base. Theoretically, the further anterior the rest seat is placed the more effective it is. The rest seat is usually located on a canine or first premolar mesial fossae.

PRINCIPLES FOR USING INDIRECT RETAINERS

more than one fulcrum line may present

IRs must be placed as far as possible from distal extension base ,for better leverage advantage

Most effective location for IRs is incisor region ,but due to their poor strength canines or premolars are used

Whenever possible two IRs ,closer to fulcrum line are taken to compensate for the compromise in distance

FACTORS AFFECTING THE EFFECTIVENESS OF INDIRECT RETAINERS

1) Effectiveness of direct retainers

In order to become IR effective proper functioning of DR should be present, I.e. the retentive arms of the direct retainer must hold the principal occlusal rests properly

2) Distance from the fulcrum line

a)Length of the distal extension base ; if it increases IR must placed far away from fulcrum line.

b) Location of the fulcrum line; ideally IR should be located at a point perpendicular to the midpoint of the fulcrum line

c) Distance from the fulcrum line; IR is placed as far as away from the fulcrum line

3) Rigidity of the connectors supporting the IR-

- **It should be rigid**

4) Effectiveness of the supporting tooth

- **surface; IR should be placed on a definite rest seat .tooth inclines and weak teeth should not be used for support**





AUXILIARY FUNCTIONS OF INDIRECT RETAINERS

1. **It tends to reduce anteroposterior-tilting leverages on the principal abutments.**
2. **Contact of its minor connector with axial tooth surfaces aids in stabilization against horizontal movement of the denture.**
3. **Anterior teeth supporting indirect retainers are stabilized against lingual movement.**
4. **It may act as an auxiliary rest to support a portion of the major connector**
5. **It may provide the first visual indications for the need to reline an extension base partial denture**

Forms of indirect retainers

1.Auxiliary occlusal rest.

2. Canine rest.

3.Canine extension from Occlusal rests.

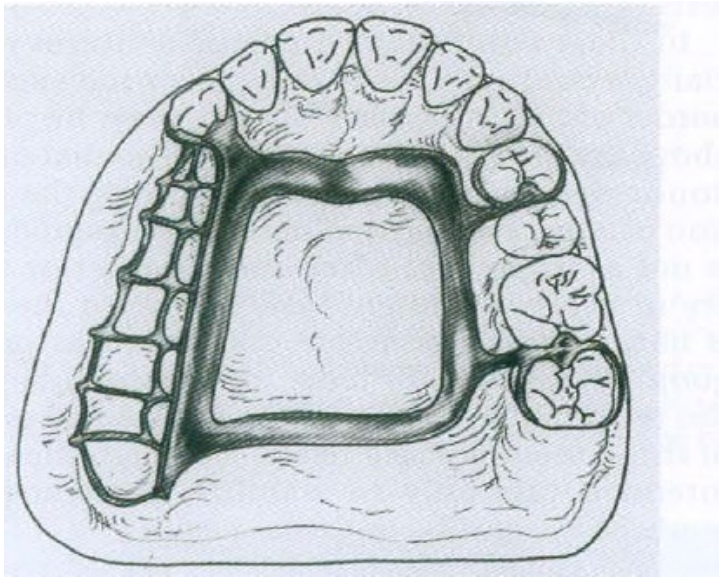
4. Cingulum bars(Continuous bars) and Linguoplates

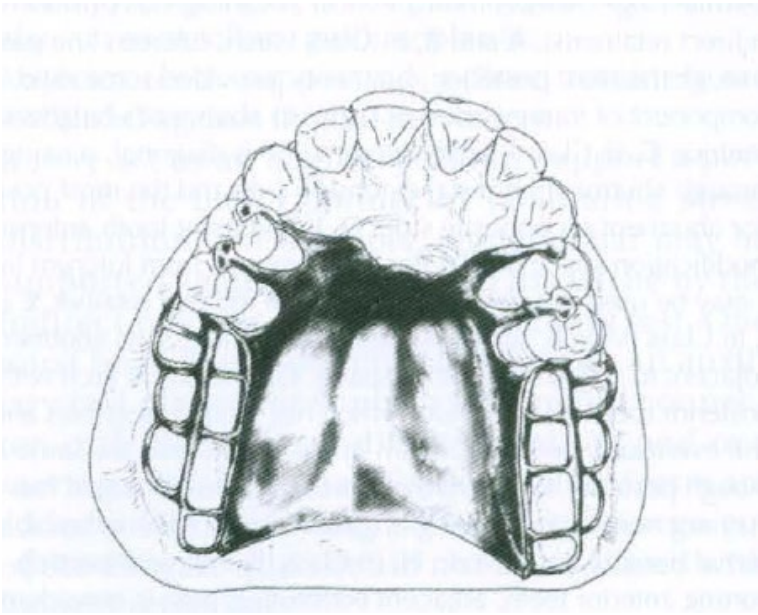
5. Modification Areas

6. Rugae support

1.Auxiliary occlusal rest

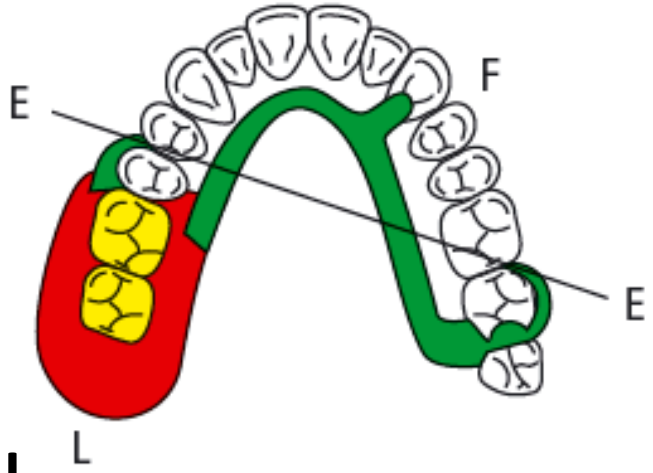
-in Kenneddy's classI-bilateral rests on mesial fossa of first premolar
-in Kenneddy's classII –mesial fossa of first premolar on opposite side
-bilateral IR-An auxiliary rest for major connector when distal abutment on modification side is poor(functional class1





2-REST(CINGULUM REST OR LINGUAL REST

When the mesial marginal ridge of the first premolar is too close to the fulcrum line , a rest may be used on the adjacent canine tooth



3- CANINE EXTENSION FROM THE OCCLUSAL REST

-Consists of a finger extension from premolar rest to the lingual slope of adjacent canine

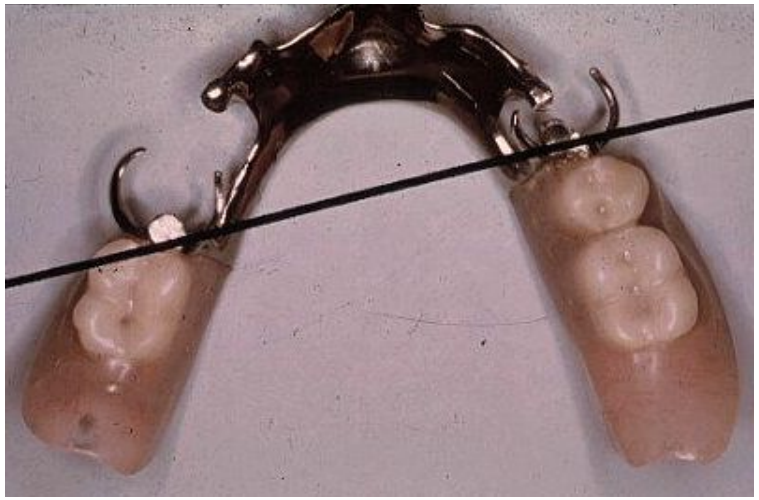
-applied when first premolar is the primary abutment

-should always used with terminal rests to prevent tipping leverage as in single cingulum canine rest



4.Cingulum bars(Continuous bars) and Linguoplates

a continuous bar retainer or superior border of the linguo-plate should never be placed above the middle third of the teeth to avoid tooth movement(Kennedy class1 & 2)
as they rest on unprepared lingual surfaces they indirectly provide indirect retention The indirect retainers are actually the terminal rests at either end that occur in the form of auxiliary occlusal rests or canine rests



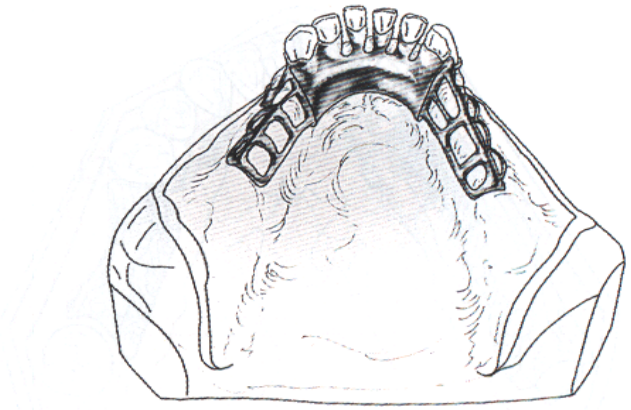
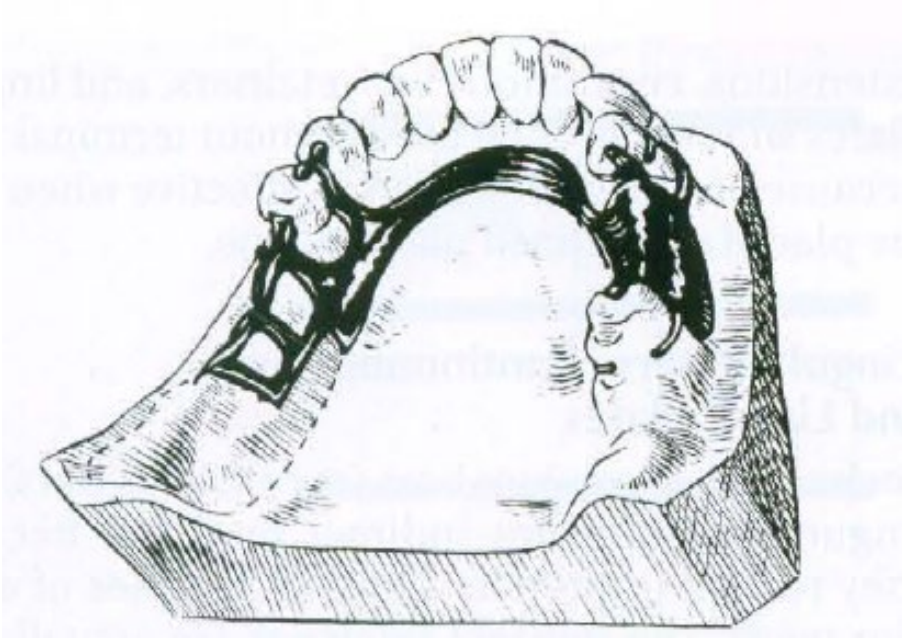


Figure 5-12 Interrupted linguoplate in presence of interproximal spaces.

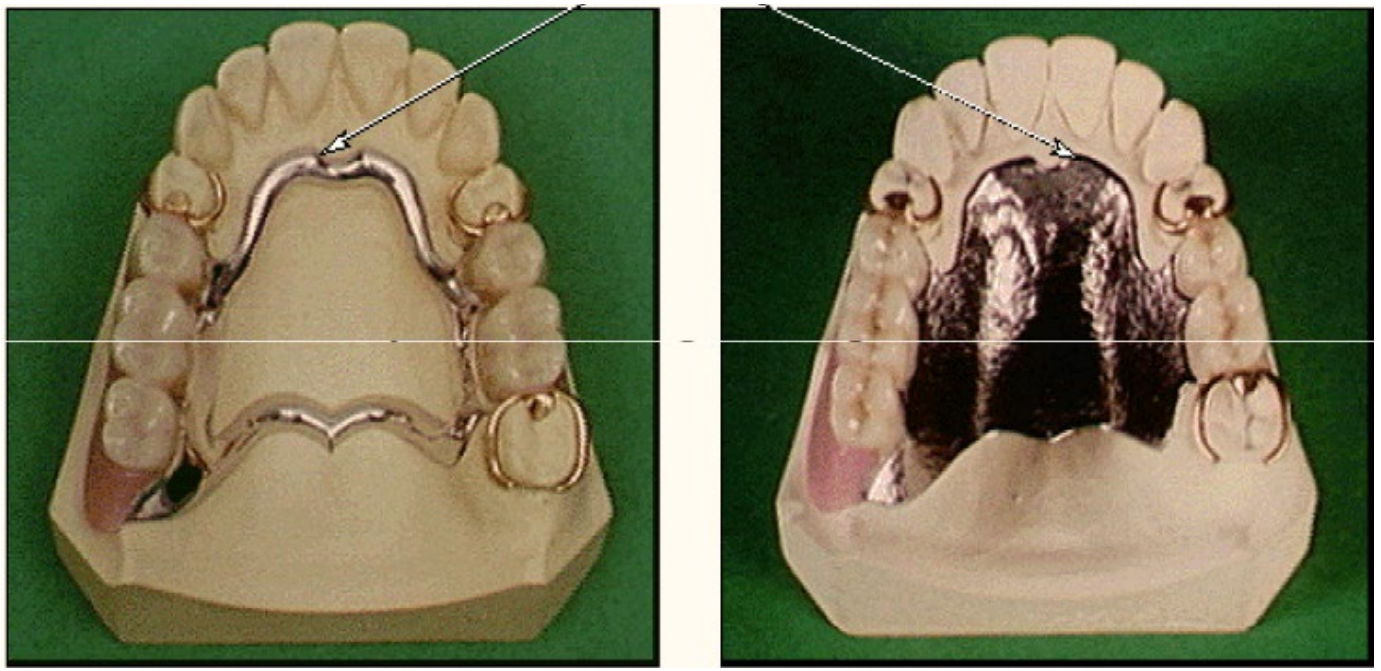
5. Modification Areas

the occlusal rest on a secondary abutment in class II modification 1 serve as an indirect retainer.
-if only one tooth is missing in the modification areas ,occlusal rest on this side should provide support for the unsupported major connector along with indirect retention



6. Rugae Support

-Rugae area is firm hence used for indirect retention especially for class I situations
-it can be used in case of ‘ u ‘shaped designs
-less effective than a tooth supported
IR



DIRECT INDIRECT RETENSION

Reciprocal arm of a direct retainer anterior to fulcrum line may act as indirect retainer

INDIRECT RETENTION FROM MAJOR CONNECTORS

-in mandible retention from denture base itself help in indirect retention

-in maxillary arch ,full palatal coverage is necessary for additional indirect retention especially when only anterior teeth are present

-it is obtained from major connector’s resistance to distortion