



Removable orthodontic appliance

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Definition

ORTHODONTIC APPLIANCES According to White and Gardener orthodontic appliance may be defined as an appliance by means of which mild pressure may be applied to a tooth or a group of teeth in a predetermined direction.

Orthodontic Removable appliances that can be inserted and removed by the patient.

Classification of Orthodontic Appliances

- According to White and Gardener it is classified in two groups.

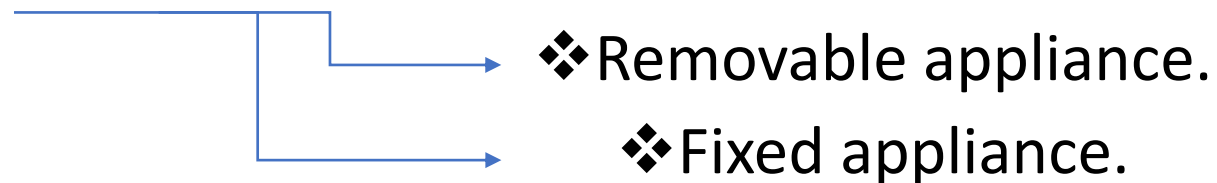
❑ 1. Mechanical Appliances.

❑ 2. Functional Appliances.

A mechanical appliance exerts pressure on the alveolar bone, through the medium of teeth in a predetermined direction, by means of screw, spring or elastics.

A functional appliance uses natural forces exerted by muscular medium which it transmits to the teeth and alveolar bone in a predetermined direction.

Mechanical appliances are further classified in two groups.




Classification of Orthodontic Appliances

- According to Haupl and Roux (1983)
 - **a. Active appliance:** A mechanical force producing elements are necessary to bring in dentoalveolar structure. Example: Labial bow, springs, screws.
 - **b. Passive appliance:** Mode of transmission of force is passive. Mechanical force producing elements are unnecessary to bring about changes in dentoalveolar structure. For example, myofunctional appliances, habit breaking appliances.



INDICATIONS

- 1. When skeletal pattern is normal and malocclusion is only due to changes in incisor inclination means dentoalveolar only.
- 2. When it is possible to treat each arch individually with removable appliances.
- 3. Malposed teeth should have their apices well in line.
- 4. Narrow arches, mild crowding, can be treated with simple expansion appliances.
- 5. Unilateral crossbite, single malpositioned tooth treated with tipping movement using removable appliance.
- 6. Mild bite correction, intrusion of incisors and extrusion of posteriors is possible with bite plane.
- 7. To maintain the corrected positions of the teeth.
- 8. To prevent and intercept the effects of abnormal habits.



CONTRAINDICATIONS

- 1. If a noticeable skeletal discrepancy exists.
- 2. There is need to correlate treatment in both upper and lower arches. For example, anchorage problems requiring intermaxillary traction and more severe discrepancies in arch width or shape.
- 3. Presence of apical malposition, severe or multiple rotations.
- 4. Bodily movements are required.
- 5. Presence of vertical discrepancies such as deep overbite, an open bite or height discrepancies between teeth.
- 6. Where severe crowding or spaces exist.
- 7. Bone is very dense and tooth movement requires more time.

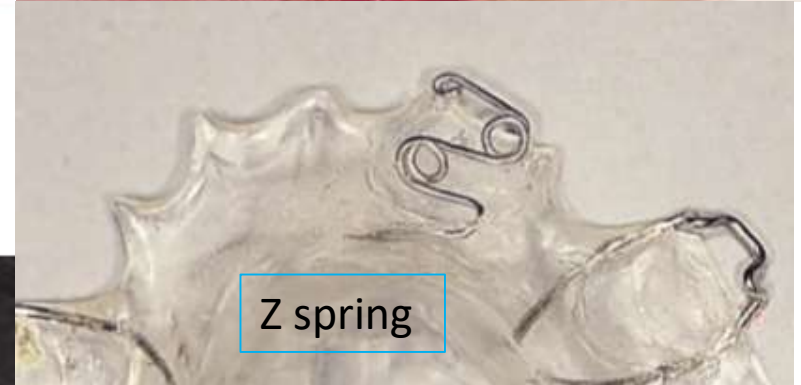
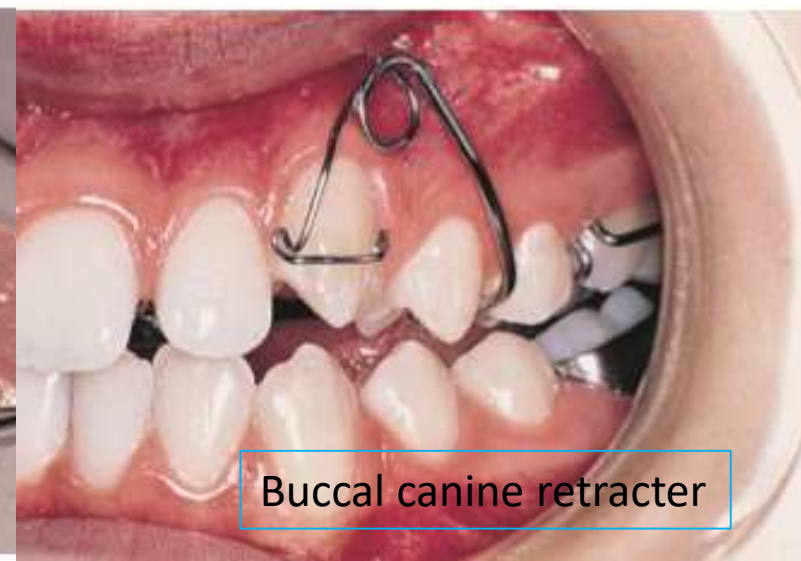
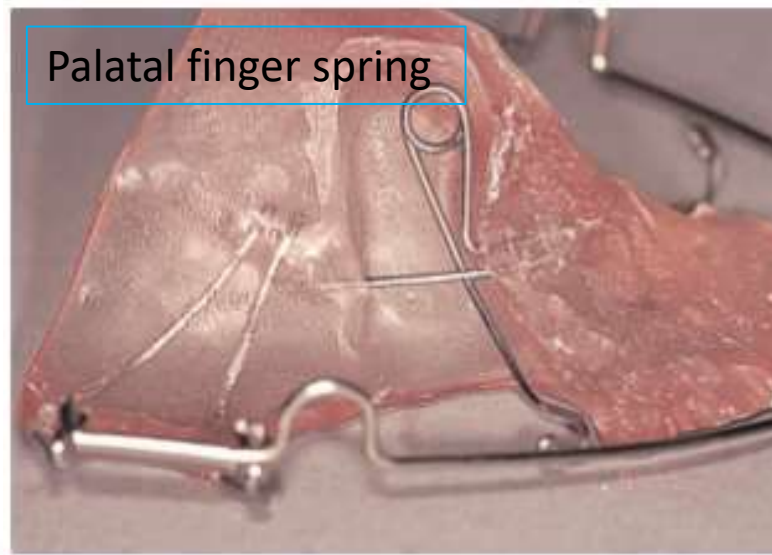
- Removable orthodontic appliance consists of following three components:

- 1. Retaining (Supporting) components
- 2. Active components
- 3. Base plate.



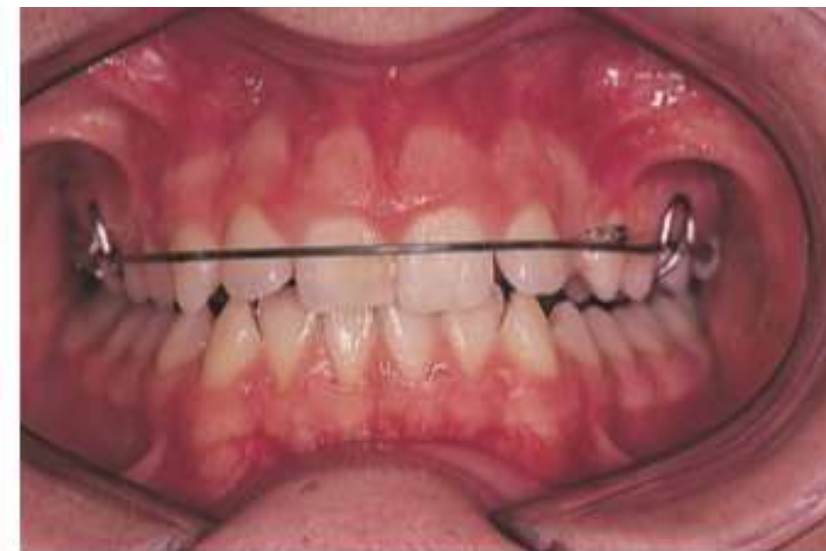
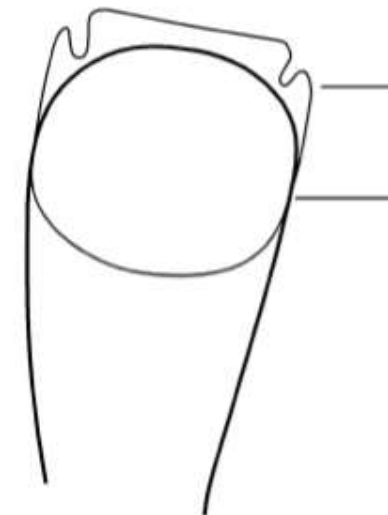
□ Active components

- Springs
- Screws



□ Retaining the appliance

- Adams clasp
- Other methods of retention

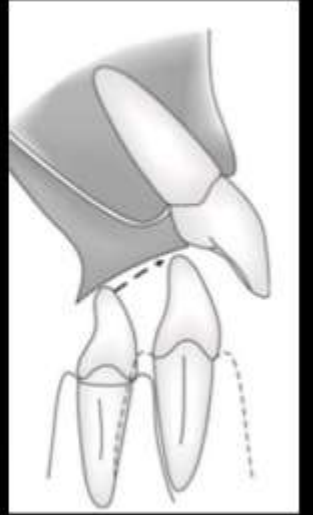


❑ Baseplate

- Self-cure or heat-cure acrylic
- Anterior bite-plane
- Buccal capping



ANTERIOR INCLINED BITE PLANE



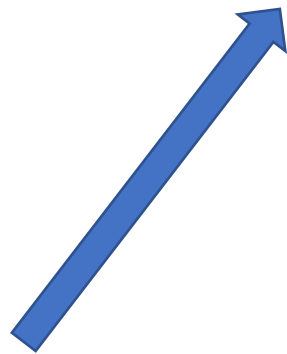
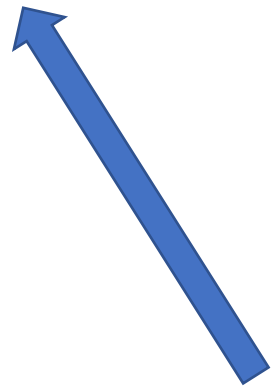
components

Supporting

Baseplate
Clasps

Active

Springs
Bows
Screws



Labial bow



Table 17.1 Advantages and disadvantages of removable appliances

Advantages

.....
Can be removed for tooth-brushing
.....

.....
Palatal coverage increases anchorage
.....

.....
Easy to adjust
.....

.....
Less risk of iatrogenic damage (e.g. root resorption) than with fixed appliances
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.....
Acrylic can be thickened to form flat anterior bite-plane or buccal capping
.....

.....
Useful as passive retainer or space maintainer
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Can be used to transmit forces to blocks of teeth
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Disadvantages

Appliance can be left out

Only tilting movements possible

Good technician required

Affects speech

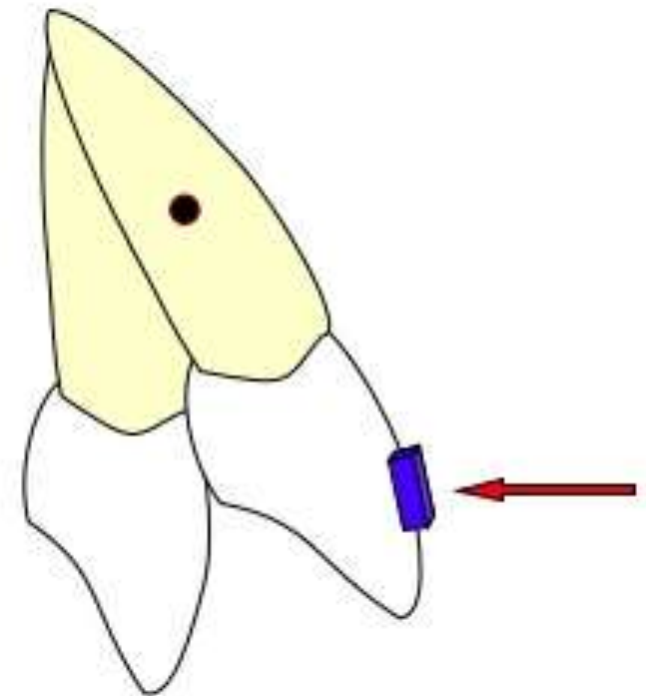
Intermaxillary traction not practicable

Lower removable appliances are difficult to tolerate

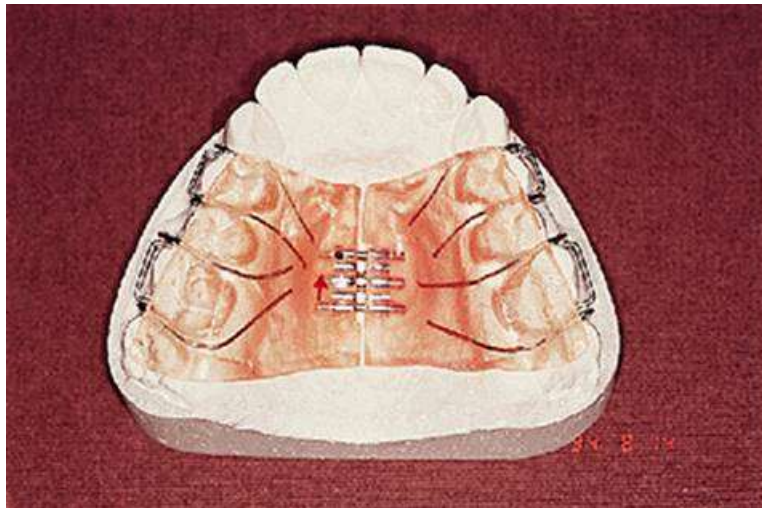
Inefficient for multiple individual tooth movements



- Removable appliances are capable of the following types of tooth movement:
- **Tipping movements** – because a removable appliance applies a single point contact force to the crown of a tooth, the tooth tilts around a fulcrum, which in a single-rooted tooth is approximately 40 percent of the root length from the apex.



- • **Movements of blocks of teeth** – because removable appliances are connected by a baseplate they are more efficient at moving blocks of teeth than fixed appliances.



- **Influencing the eruption of opposing teeth** – this can be achieved either by use of:
 - (1) a **flat anterior bite-plane**, which frees the occlusion of the lower incisors allowing their eruption. This is useful in overbite reduction
 - (2) **buccal capping**, which frees the contact between the buccal segment teeth. This may also be of value when intrusion of the buccal segments is required .



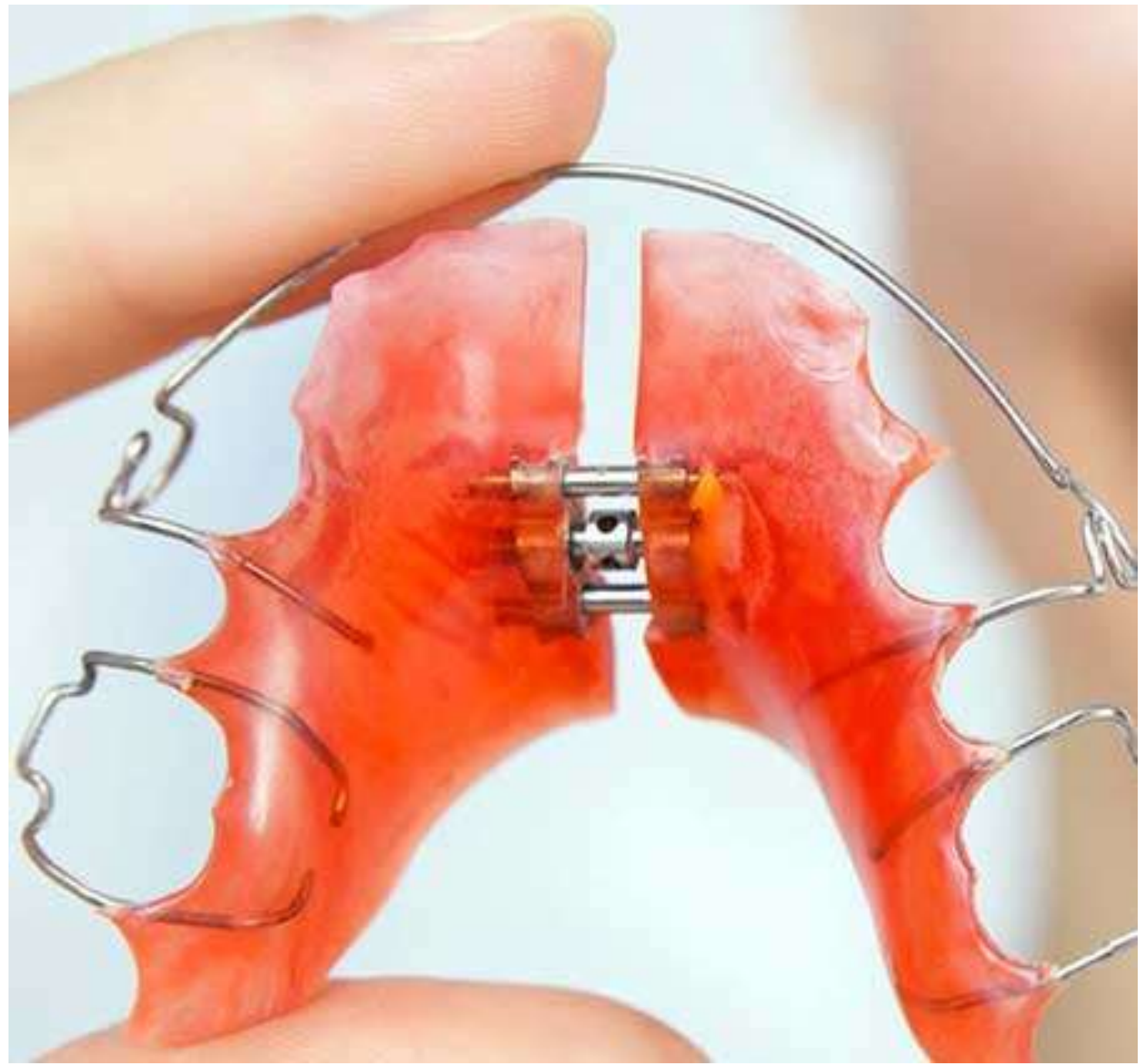
Monitoring progress

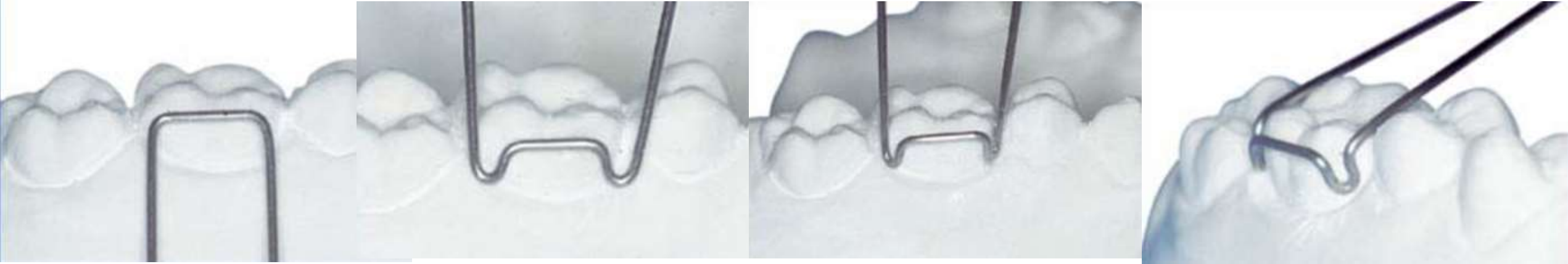
- ❑ Ideally, patients wearing active removable appliances should be seen around every 4 weeks.
- ❑ Passive appliances can be seen less frequently, but it is advisable to check, and if necessary adjust, the retention of the clasps every 3 months.
- ❑ During active treatment it is important to establish that the patient is wearing the appliance as instructed. Indications of a lack of compliance include the following:
 - the appliance shows little evidence of wear and tear;
 - the patient lisps (ask the patient to count from 65 to 70 with, and without, their appliance);
 - no marks in the patient's mouth around the gingival margins palatally or across the palate;
 - frequent breakages.

Monitoring progress

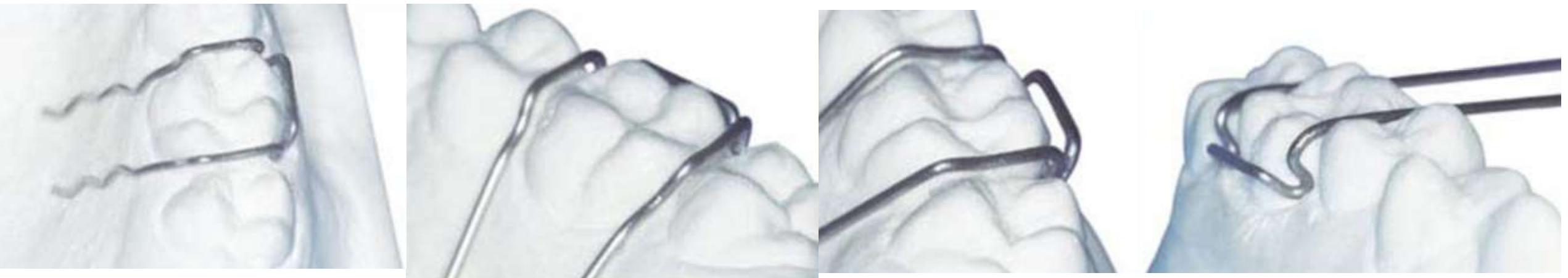
If wear is satisfactory the following should be considered:

- Check the treatment plan (and progress onto the next step if indicated).
- The patient's oral hygiene.
- Record the molar relationship, overjet and overbite.
- Re-assess anchorage.
- Tooth movement since the last visit.
- Retention of the appliance .
- Whether the active elements of the appliance need adjustment.
- Whether the bite-plane or buccal capping need to be increased and/ or adjusted.
- Record what action needs to be undertaken at the next visit.





Adams clasp



ball clasp



labial bow / Hawley



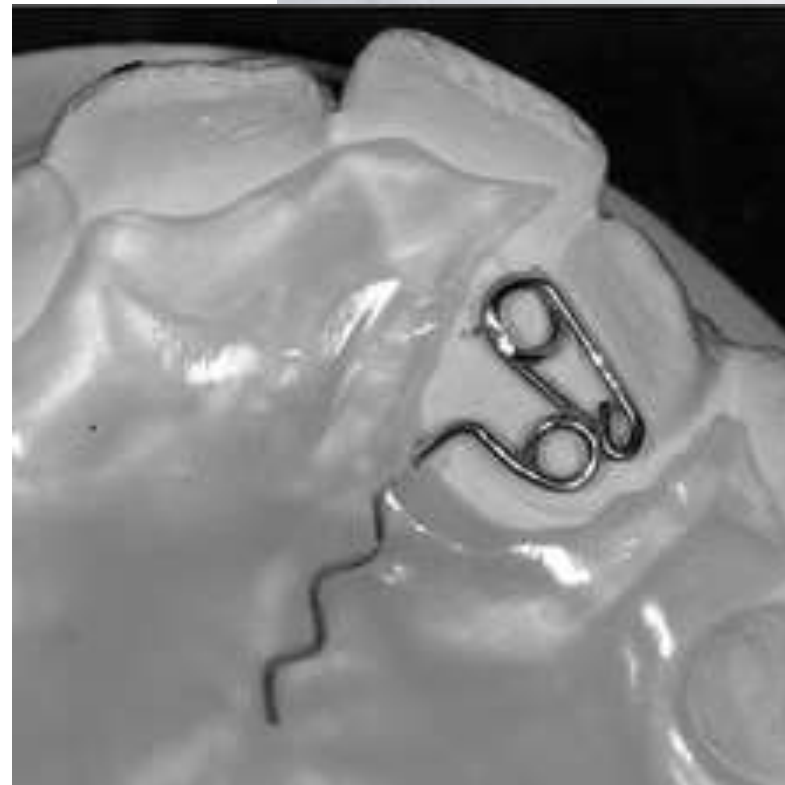
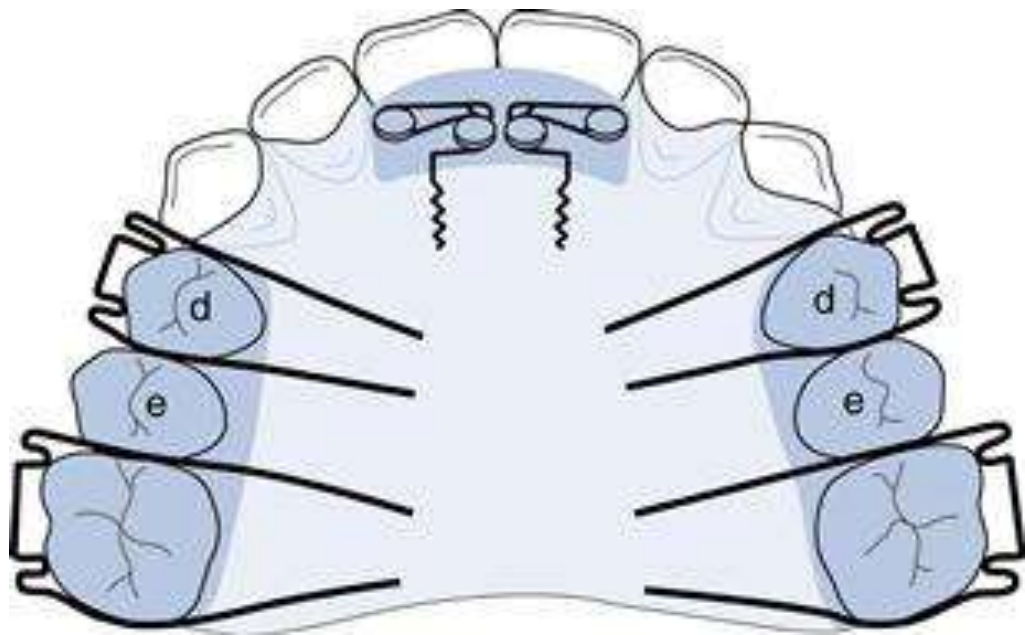
intermaxillary bow / reverse Hawly



triangular clasp



Z - spring



Key points

Removable appliances are:

- Only capable of tipping movements of individual teeth
- Useful for moving blocks of teeth
- Useful for freeing the occlusion with the opposing arch
- Useful as passive appliances (e.g. for retention)
- More commonly used nowadays as an adjunct to fixed appliances (rather than the sole appliance to correct a malocclusion)

