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RETENTION AND RELAPSE

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No orthodontic treatment should be done when long standing result cannot be achieved.

Retention

Retention is holding of teeth in an ideal aesthetic and functional position at the end of orthodontic treatment.

Why retention is necessary?

1. The gingival and periodontal tissues are affected by orthodontic tooth movement arc require time for reorganization when the appliances are removed.
2. The teeth may be in an inherently unstable position after treatment, so that soft tissue pressure constantly produces a relapse tendency.
3. Changes produced by growth may alter the orthodontic treatment result.

Types of retention

According to Duration

- Group I –No retention
- Group II- Limited retention
- Group III- Prolonged retention
- Group IV- Permanent retention

According to malocclusion

- Class II
- Class III

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- Deep bite
- Anterior open bite

According to Duration

Group I –No retention

Period of retention: Not applicable

Indications:

1. Anterior and posterior cross bite
2. Treatment after extraction or serial extraction
3. Highly placed canine
4. Impacted mandibular 2nd premolar

Group II- Limited retention

Period of retention:

Three to six (3-6) months. First 3 months full time retention, and next 3 months only at night

Indications:

1. Class I proclination and spacing of maxillary incisor
2. Class I and Class II extraction cases
3. Corrected deepbite cases
4. Class II division 2 cases

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Group III - Prolonged retention

Period of retention: Rotation cases require 232 days or more

Indications:

1. Forces produced by lips, cheeks and tongue during rest position- Soft tissue acts as a mould for the teeth. If any tooth moves out of the muscle balance, then relapse occurs
2. Persisting abnormal habits
3. Failure to upright the roots can open up extraction spaces.
4. Lack of balance between buccal and lingual forces
5. Presence of excess tooth material to arch size
6. Poor patient cooperation, by not wearing the appliance regularly
7. Completion of the treatment before completion of growth; especially in skeletal Class III and open bite, deep bite etc.

Group IV- Permanent retention

Period of retention: Lifelong

Indications:

1. Severe rotation
2. Midline diastema
3. Cleft palate cases
4. Generalized spacing

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5. Expansion of lower arch

According to Malocclusion

Class II

1. Overcorrection of occlusal relationship as a finishing procedure
2. It is better not to move the lower incisors too far forward. If more than 2mm forward repositioning of the lower incisors occurred during treatment, permanent retention wilt be required
3. For moderate to severe Class II cases- Fixed appliance along with headgear to the upper arch or activator-bionator type functional appliance at night after active treatment till the growing age subside

Class III

1. In mild Class III problems a functional appliance or a positioner may be sufficient

2. For moderate to severe Class III cases surgical correction after the growth is complete is the only stable treatment. Chin cap or Class III functional appliance as a retainer rotate the mandible downward causing the growth to be expressed more vertically and less horizontally

Deep bite

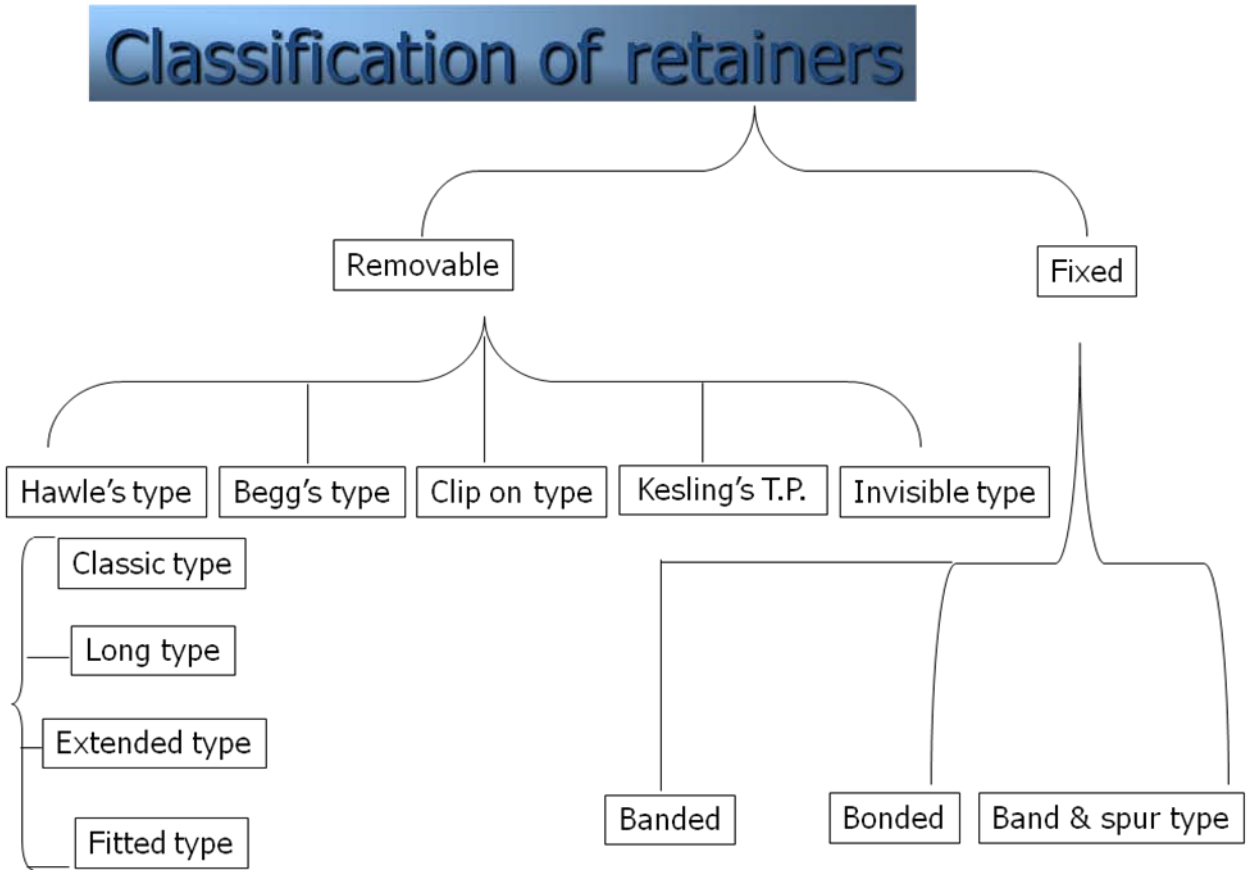
Upper removable appliance with a bite plane, which does not separate the posterior teeth, at night for several years after completion of the active treatment, may be required.

Anterior open bite

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1. Correction of the thumb sucking and tongue-thrust habit
2. Open bite activator or bionator or high pull headgear along with removable retainer to prevent elongation of posterior teeth at night time

Types of retainer



Removable

Hawley's retainer

Begg's retainer

Kesling tooth positioned

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Hawley's appliance

- Designed in 1920 by Charles Hawley.

- Most frequently used retainer
- Consists of claps on molars and a short labial bow extending from canine to canine having adjustment loops

Begg's retainer

Consists of a labial wire that extends till the last erupted molar and curves around it to get embeded in acrylic that spans the palate.

Advantage:

There is no cross over wire that extends between the canine and premolar thereby eliminating the risk of space opening.

Clip – on retainer / spring aligner

This appliance is made of a wire frame work that runs labially over the incisors and then passes b/w the canine and premolar and is reserved to lie over the lingual surface. Both the labial as well as lingual segments are embedded in a strip of clear acrylic.

Use: To bring about corrections of rotations commonly seen in lower anterior region.

Wrap around retainer

Extended version of spring aligner

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Consists of wire that passes along the labial as well as lingual surfaces of all erupted teeth which is embedded in a strip of acrylic.

Use: In stabilizing a periodontally weak dentition.

Kesling tooth positioner

Made of thermoplastic rubber like material that spans the inter – occlusal space and covers the clinical crowns of the U/L portion of teeth and a small portion of the gingiva.

Needs no activation at regular intervals and is durable.

Drawbacks: - difficulty in speech

- risk of TMJ problems

Invisible retainers

Fully cover the clinical crowns and a part of the gingival tissue.

Made of ultra thin transparent thermoplastic sheets using a Biostar machine.

Esthetical and go unnoticed.

Fixed

Band and Spur

Bonded canine to canine retainer

Bonded lingual retainer

Banded canine to canine retainer:

-Commonly used in lower anterior region.

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-Canines are banded and a thick wire is contoured over the lingual aspects and soldered to canine bands

Bonded lingual retainers:

-Bonded on lingual aspects following anterior curvature.

-Ends are curved over the canines where it is bonded.

Band and spur retainers

Used where a single tooth has been orthodontcally treated for rotation correction or labiolingual displacement.

The tooth that has been moved banded and spurs are soldered onto the bands so as to overlap the adjacent teeth.

Requirements of a good retainer

- It should restrain each tooth that has been moved into the desired position in directions where there are tendencies toward recurring movement.
- It should permit the forces associated with functional activity to act freely on the retained tooth, permitting them to respond in as nearly a physiologic manner as possible.
- It should be as self cleaning as possible and should be easy to maintain optimal hygiene.

*** Theories of Retention**

Riedels nine theories Moyers added another theory as the tenth theorem.

Theorem 1:

Teeth that have been moved tend to return to their former position.

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Theorem 2:

Eliminating of the cause of malocclusion will prevent relapse.

Theorem 3:

Malocclusion should be over corrected as a safety factor.

Theorem 4:

Malocclusion should be over corrected as a safety factor.

Theorem 4:

Proper occlusion is a potent factor in holding teeth in their corrected positions.

Theorem 5:

Bone and adjacent tissues must be allowed time to reorganize around newly positioned teeth.

Theorem 6:

If the lower incisors are placed upright over basal bone they are more likely to remain in good alignment.

Theorem 7:

Corrections carried out during periods of growth are less likely to relapse.

Theorem 8:

The farther the teeth have been moved the lesser is the risk of relapse.

Theorem 9:

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Arch form, particularly in the mandibular arch cannot be permanently altered by appliance therapy.

Theorem 10:

Many treated malocclusions require permanent retaining devices.

Advantages of fixed retainer

- Reduced need for patient co-operation
- Can be used when conventional retainers cannot provide same degree of stability.
- Bonded retainers are more esthetics
- No tissue irritation unlike what may been seen in tissue bearing areas of Hawley's retainer
- Can be used for permanent and semi permanent retention.
- Do not affect speech.

Disadvantages of fixed retainers

- More cumbersome to insert
- Increased chair side time
- More expensive
- Loss of healthy tooth material

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- Tend to discolor

Relapse

Definition: Relapse has been defined as “The loss of any correction achieved by orthodontic treatment.”

Causes of relapse

1. Tension produced by periodontal ligament
2. Whenever teeth are moved orthodontically, the periodontal fibers are stretched. The stretched fibers contract and cause relapse. The principal fibers of the periodontal ligament reorganize in about 4 weeks time but the supra alveolar gingival fibers takes more time to rearrange around the new position.
3. Occlusal forces associated with faulty interdigitation of teeth
4. Occlusal force associated with abnormal reduction of the interocclusal spaces.

In most cases relapse occurs due to a combination of causes.

Causes attributing to relapse:

1. Periodontal ligament Tractions:

Inadequate retention after active orthodontic treatment. Whenever teeth are moved orthodontically, the periodontal principal fibers and the gingival fibers that encircle the teeth are stretched. These stretched fibers can contract and are thus a potent cause of relapse.

2. Relapse due to growth related changes:

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Patients with skeletal problems associated with class II, class III, open bite or deep bite malocclusion may exhibit relapse.

3. Bone adaptation:

Teeth that have been moved recently are surrounded by lightly calcified osteoid bone. Thus the teeth are not adequately stabilized and have a tendency to move to their original position.

4. Muscular Forces:

Teeth are encapsulated in all directions by a blanket of muscles. Muscle imbalance at the end of the orthodontic therapy can result in reappearance of the malocclusion.

5. Failure to eliminate the original cause:

Failure to remove the etiology can result in relapse.

Role of 3rd molar:

The pressure exerted by the erupting 3rd molars in believed to cause late anterior crowding predisposing to relapse.

Role of occlusion:

Presence of certain occlusal mannerisms such as clenching, grinding, nail biting, lip biting etc... are important cause of relapse.

Inadequate retention:

After active Rx of orthodontic tooth movement if there is inadequate retention. We need to stay teeth in retention position. If not there is chance of relapse.

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6. Living the tooth in undesirable area

Tooth should be placed in occlusal, cuspal & oro-facial balance.

7. Placing the tooth in a crowded position

8. Persistent abnormal habit

9. Poor patient's co-operation

Prevention of Relapse:

(1) Over rotation.
(2) Prolonged retention.
(3) Treatment of rotated tooth should be performed at early age.
(4) Placement of teeth in oro–facial soft tissue balance.
(5) Placement of teeth in occlusal equilibrium.
(6) Pericision – surgical resection of stretched fiber around gingival socket margin (supra-alveolar fibers).

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Dedicated To

My Mom, Zubaida Shaheen

My Dad, Md. Islam

&

My Only Son

Mohammad Sharjil

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