Periodontal Considerations During Orthodontic Treatment


www.kau.edu.sa/aakbr
Why is it important?

- Malocclusion can affect periodontal health
- Tooth movement in the presence of inflammation causes bone resorption
- Oral hygiene maintenance is a key for a successful orthodontic treatment
- Orthodontic treatment can be harmful to periodontal status (plaque retention)
- Orthodontic treatment can be beneficial and therapeutic to periodontal problems
There is no direct cause-and-effect relationship between malocclusion and periodontal and gingival health?

- Class of malocclusion shows no consistent relation to inflammation and periodontal destruction.
- No positive associations were found between crowding, spacing, periodontal destruction and gingival inflammation.
- No consistent relationship between crossbite and periodontal disease.
- Leaving a malocclusion untreated in young patients does not influence subsequent development or non-development of periodontal disease.
BUT

The reaction of the gingival and periodontal tissues to malocclusion varies from the mild and transient to the severe and irreversible effects.

In general, malocclusion is considered as a contributory factor (not a primary one) for gingival and periodontal disease as it facilitates plaque accumulation.
Crowding and Gingival/ Periodontal tissues

Crowding may adversely affect the health of gingiva and periodontium if:

1. Dental irregularity creates inaccessible areas between and around the teeth (plaque accumulation).
2. If teeth receive their occlusal load non-axially, leading to a lateral force component during functions.
3. The presence of poor interproximal contacts, which might cause food impaction.
4. If ectopic teeth erupt through oral mucosa rather than through adequate attached gingiva (mucogingival defect).
Increased Overjet and Overbite

- Inadequate lip cover and abnormal anterior oral seal (Increased overjet) often reduce the capacity for natural food clearance leading to food debris and plaque accumulation.

- A deep overbite brings mandibular incisal edges in contact with the cervical part of the upper incisors or with the gingiva itself, causing direct trauma, which may lead to inflammation due to food impaction, to ulceration resulting from the impinging of opposing teeth, or to pathologic migration of upper incisors.
Crossbite

- Anterior teeth in crossbite often show gingival recession, more gingival inflammation and greater pocket depth than adjacent correctly related teeth.

- Crossbite might result from teeth erupting ectopically and, as such, have reduced width or absence of adequate attached gingiva especially in the lower incisor region.
Openbite, Lip seal and Mouth Breathing

- Lack of masticatory activities may lead to the accumulation of partially dehydrated plaque around the anterior teeth, which may lead to the development of hyperplastic type of gingivitis.

- Mouth breathing and poor lip coverage show similar effect except that the ill-effect of mouth breathing is seen more on the palatal side while poor lip coverage largely affect the labial side.
Rotation

- There is evidence that severe rotation of teeth is associated with a reduction of the supporting alveolar bone.

- Malocclusion, in exceptional situations, might cause occlusal trauma, which causes more damage when accompanied with plaque accumulation.
Occlusal Traumatism

Injury to the periodontium resulting from occlusal forces in excess of the reparative capacity of the attachment apparatus.

- **PRIMARY** - Pathologic periodontal tissue changes induced by occlusal forces in excess of normal masticatory function.
Occlusal Traumatism

- **SECONDARY** - Pathologic periodontal tissue changes induced by occlusal forces produced by normal masticatory function on teeth with decreased attachment apparatus.
Most literature supports the fact that, in the presence of excessive occlusal forces, there is alveolar bone resorption leading to an increase in tooth mobility and an increased width of the periodontal ligament space with cementum and collagen resorption. If this takes place in the absence of infection, it should be reversible, and no attachment loss should occur. We have only very shaky evidence to show definitively that we get formation of angular defects secondary to occlusal traumatism alone.
Occlusal Traumatism

Most clinical and animal studies show no permanent attachment loss due to occlusal traumatism in a healthy periodontium. Except, if the alveolar plate is thin, permanent loss of attachment will be observed.

There are conflicting data regarding the effect of orthodontic treatment on the periodontal tissues, which vary from beneficial to harmful effects.
Potential Benefits

- Improvement of width of attached gingiva, especially when moving a labially positioned tooth lingually.

- Inducement of bone formation and osseous augmentation (slow eruption).

- Improvement of the architecture of periodontal tissue and hygiene that is easier to maintain.

- Help to reduce or eliminate infrabony defects.

- Eliminate gingival margin discrepancy (align gingival margins)
Potential Benefits

- Sitting preparation margins supragingivally and re-establishing biologic width in teeth with subgingival or subcrestal margins (forced eruption).

- Closure of spaces of extracted teeth may help to solve periodontal disease complications.

- Eliminating traumatic occlusion
Advantages:

- Good abutment paralleling.
- Less Destructive and safer preparation.
- Vertical stresses on teeth.
- Correct replacement tooth shape.
- Improved architecture of periodontal tissue and hygiene that is easier to maintain.
- Replacements that conform better to anatomic and functional standards
- Greater feasibility of implant placement.

Cozzani G. Restorative dentistry, endodontic and orthodontics. Garden of Orthodontics, 2000
Before Treatment
Radiographs
After treatment
Orthodontic extrusion:

Types

Rapid
- Tooth (-) bone

Slow
- Tooth (+) bone
  - Infrabony defects.
  - Osseous augmentation.
  - Gingival discrepancies.

Forced Eruption
Forced Eruption

- It helps to save isolated teeth in which caries, trauma, or iatrogenesis have destroyed the clinical crown by bringing the fractured, diseased or prepared margins of the neck of the tooth more coronally (supracrestal), to reestablish the biological width.

- Fibrotomy, which is done before the active eruption, is essential for the success of the procedure.
Considerations of forced eruption:

- Root length
- Root form
- Level of the fracture
- Relative importance of the tooth
- Esthetic
- Endo./perio. prognosis
Forced Eruption:

Initial records

- 22ys old female
- Chief complaint: fix all her teeth
- Restorative dentist asked for:
  1. space management
  2. forced eruption of upper laterals

1-1-2006
Radiographs
Radiographs
Leveling and alignment
Forced eruption started
Fibrotomy procedure
Progress radiographs
Progress photos

Temporary crown
Types

Rapid
Tooth - bone

Slow
Tooth + bone
- Infrabony defects.
- Osseous augmentation.
- Gingival discrepancies.

Forced Eruption