

Periodontal Considerations During Orthodontic Treatment

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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 an evidence that sever 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.



Occlusal Traumatism

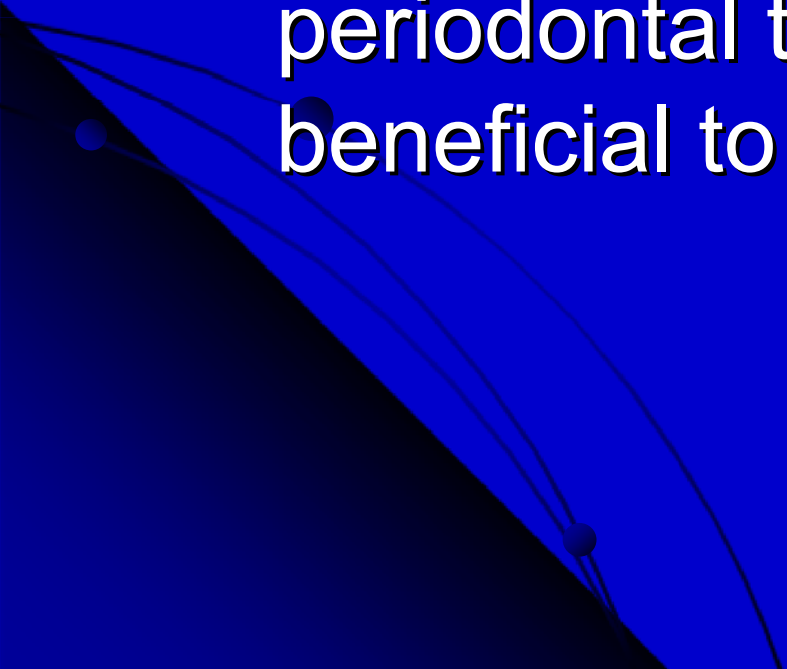
Most literature supports the fact that, in the presence of excessive occlusal forces, there is alveolar bone resorption leading to an increase in tooth mobility and an increased width of the periodontal ligament space with cementum and collagen resorption. If this takes place in the *absence of infection*, 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.

Gher ME. *Changing concepts. The effects of occlusion on periodontitis.* Dent Clin North Am 1998 Apr;42(2):285-99

The Effect of Orthodontic Treatment on Periodontal Tissues

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

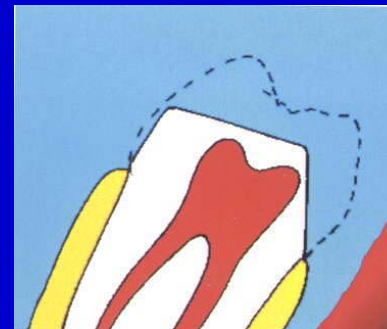
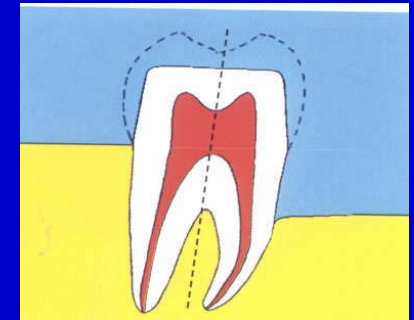
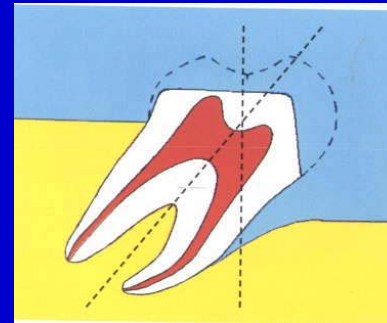
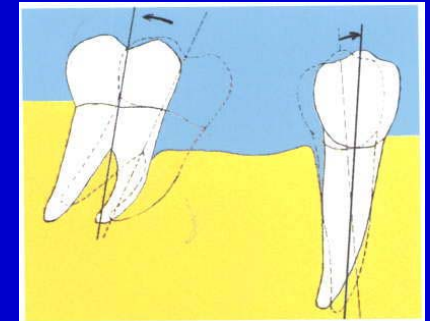
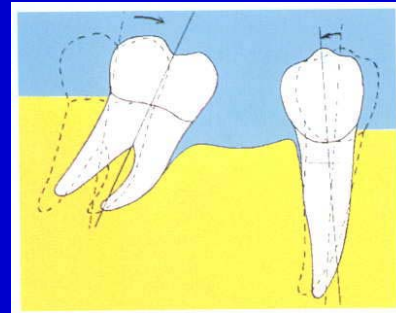
- Sitting preparation margins supragingivally and re-establishing biologic width in teeth with subgingival or subcrestal margins (forced eruption).
- Closure of spaces of extracted teeth may help to solve periodontal disease complications.
- Eliminating traumatic occlusion

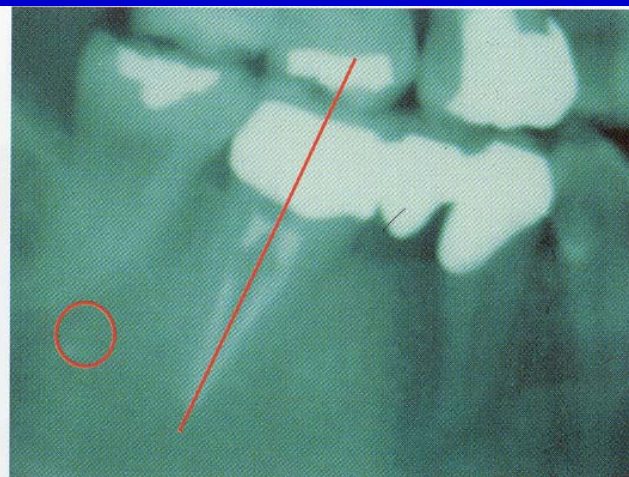
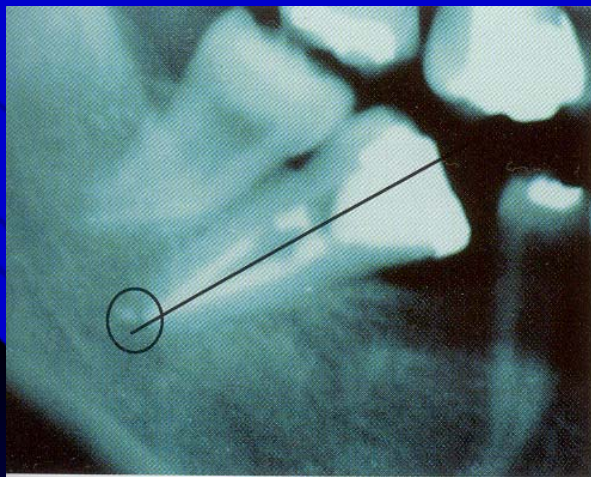


Uprighting of posterior teeth:

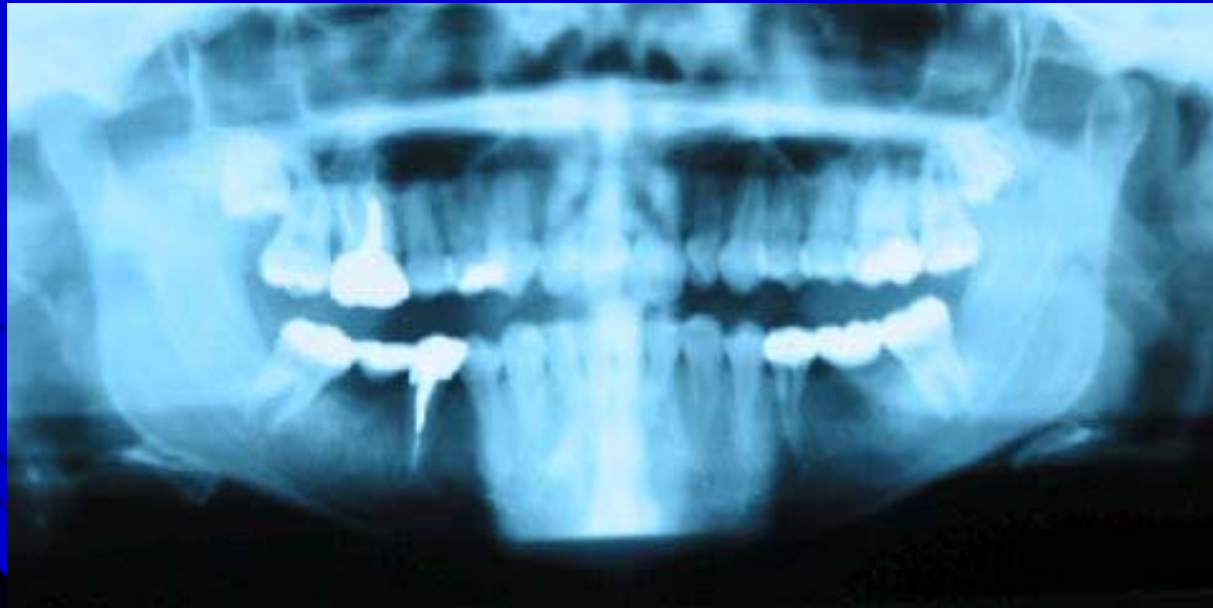
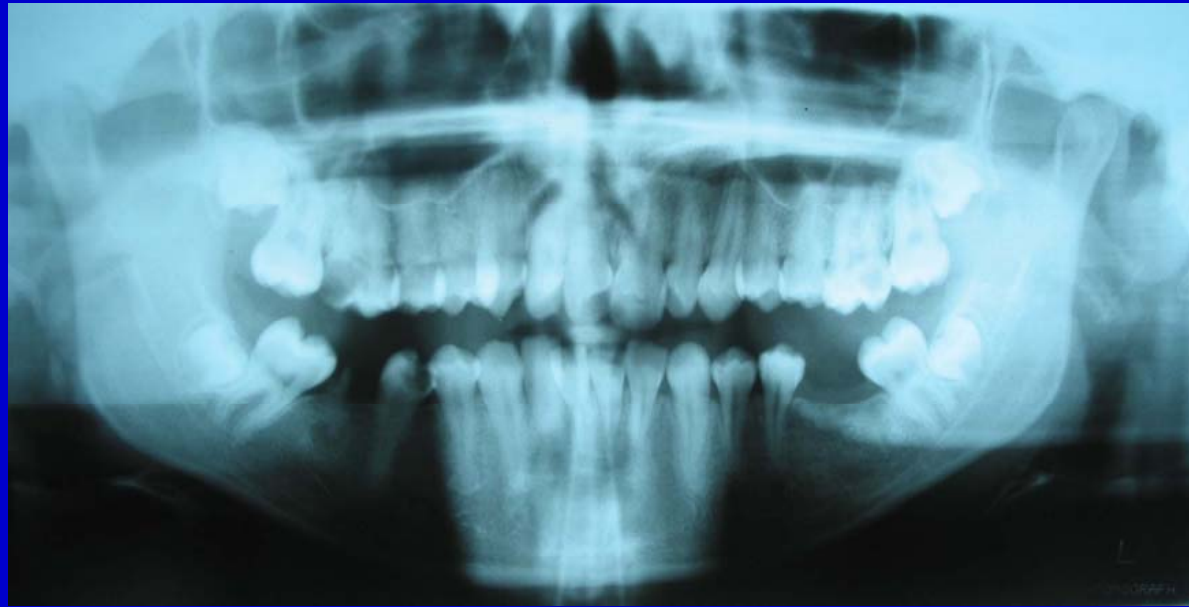
Advantages:

- **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.**









Before Treatment





Radiographs



After treatment



Orthodontic extrusion:

Types

Rapid

Slow

Tooth (-) bone

Tooth (+) bone


*Forced
Eruption*

- Infrabony defects.
- Osseous augmentation.
- Gingival discrepancies.

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



Radiographs



Radiographs





Leveling and alignment



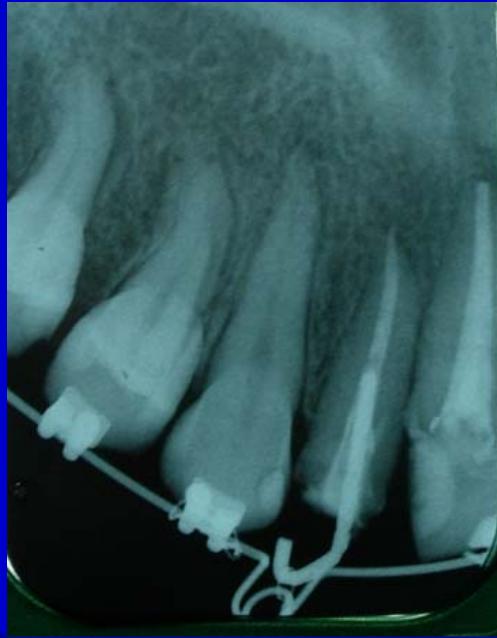
Forced eruption started

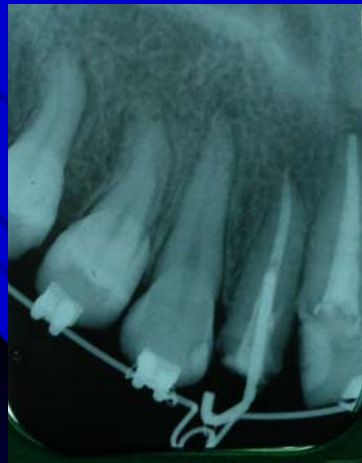
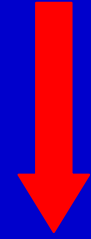
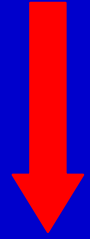
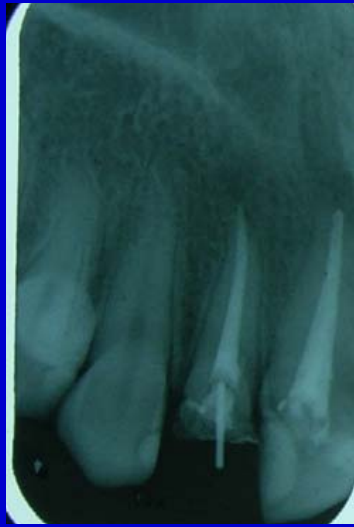
Fibrotomy procedure





Progress radiographs





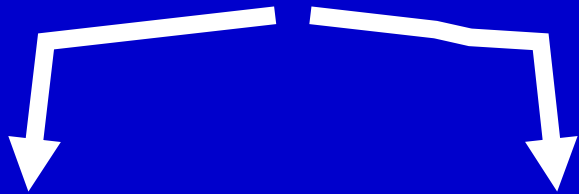
Progress photos



← Temporary crown



Types



Rapid

Slow

Tooth - bone

Tooth + bone

- Infrabony defects.
- Osseous augmentation.
- Gingival discrepancies.

Forced Eruption

