Esthetic Crown Lengthening

Esthetic Crown Lengthening

ACCELERATED OSTEOGENIC ORTHODOTNICS (WILKODONTICS)

- It is a technique developed by Wilko brothers.
- has roots in orthopedics, back to the early 1900s and 1950s
- It combines;
  - Selective decrotication
  - Augmentation
  - Orthodontic tooth movement

Int. J. Period. Restor. Dent. 21:9-19, 2001

ACCELERATED OSTEOGENIC ORTHODOTNICS (WILKODONTICS)

Concept:

- Bone injury increases the intensity of its healing response through transient state of remodeling (RAP of Harvold), confirmed by Sebaoun et al, 2008.
- Osteopenia (decrotication) is responsible for the accelerated tooth movement (Wilkos)

Int. J. Period. Restor. Dent. 21:9-19, 2001

J Periodontol.*79*(*9*):*1679-88, 2008*.

ACCELERATED OSTEOGENIC ORTHODOTNICS (WILKODONTICS)

Concept:

Wilkos used their knowledge of corticotomy, and their observations of RAP, to develop their patented AOO technique in 1995.

Int. J. Period. Restor. Dent. 21:9-19, 2001

ACCELERATED OSTEOGENIC ORTHODOTNICS (WILKODONTICS)

Objectives:

- Accelerate orthodontic treatment
- Prevent root resorption
- Ensure periodontal health

ACCELERATED OSTEOGENIC ORTHODOTNICS (WILKODONTICS)

Indications:

- Adults and children
- Healthy patients
- Contraindicated in periodontal disease, bone disease, poor roots, systemic disease
- Patient demands fast orthodontics
- Impacted teeth
- **Expansion**

ACCELERATED OSTEOGENIC EXPANSION

Advantages:

- Reduced treatment time/ Faster tooth movement (4 times faster)
- Can be used efficiently and safely to treat bilateral/**unilateral crossbite (Differential Expansion)**
- Ensure better periodontal health
- Using simple expanders
- Reduced root resorption
- Expanding alveolar apical base
- Better stability

ACCELERATED OSTEOGENIC EXPANSION

Technique:

1. Prepare expansion device before surgery
2. Full thickness flap (Sulcular incision)
   (Reflect flaps beyond the apices of the teeth)
3. Decortication cuts and points up to 0.5 mm in depth
4. Selective medullary penetration points
5. Grafting: DFDB or Bioss/ combined with Ca-Sulphate
6. Reposition flaps
7. Start orthodontic expansion after 7-10 days
8. Follow up with the periodontist

Actual Damage to Periodontal Tissues and Teeth in Orthodontic Patients

Harmful Effects

- G and PDL changes related to orthodontic TX are,in general, transient with no permanent damage. However lengthy orthodontic TX, accompanied with sustained poor oral hygiene leads to G. and PDL damage.

- The deleterious effects include gingivitis, gingival hyperplasia, marginal periodontitis, gingival recession especially at extraction sites, loss of attachment, interdental clefts, especially at the vestibular aspects of extracted mandibular first premolar sites, reduced width of keratinized gingiva, marginal bone loss and apical root resorption.

Orthodontic Appliances could potentially cause ***gingivitis and progress to periodontitis***, especially during ***tipping and intrusive*** movements.

This is because gingival pockets tend to deepen during those movements , resulting in the development of a pseudo pocket, leading to an opportunity for subgingival bacterial colonization and periodontal breakdown

(Ericsson et al, 1977)

*In an animal study, active moderate to advanced periodontitis during treatment with fixed appliances can potentially cause **accelerated bone loss** beyond what is expected from plaque accumulation (Synergistic effect).*

Mechanism:

1- Orthodontic force → widening of the periodontal ligament

Clinical mobility (a potential aggravating factor for periodontal disease)

2- Synonymous occlusal trauma (occlusal trauma, clenching or grinding)

(Wennstrom et al, 1993)

On the other hand, no clinically significant damage could occur to the periodontium or the teeth if the patient maintains good oral hygiene

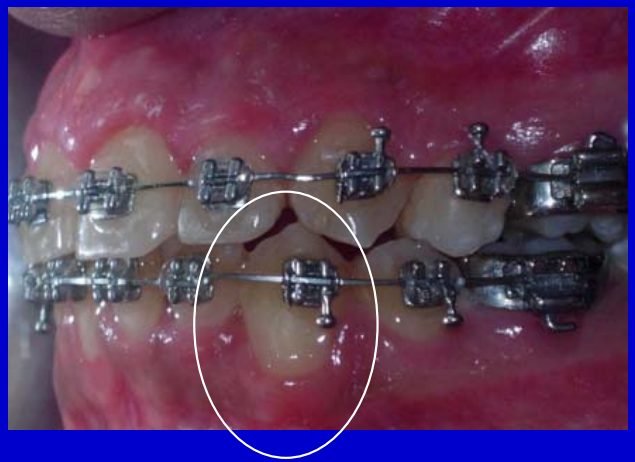
(Alstad & Zachrisson,1979;Boyd et al,1989)

Gingival Recession

- Always check and record any recession (thin gingiva or inadequate attached gingiva) before treatment
- Orthodontic patients may experience greater gingival recession than untreated patients (Controversial)
- If tooth movement is in labial direction, labial recession should be grafted before treatment (Connective tissue graft)

Gingival Recession

- If tooth movement is in palatal direction, there is a chance for the tissue to move corornally and become thicker. So grafting should be postponed after orthodontic treatment.
- If no orthodontic treatment is planned for children, width of attached gingiva should be monitored only periodically as the width of attached gingiva generally increases with growth.
- Last decision should be taken by periodontist, who should decide when to graft or not.



Suggestions to Improve Plaque Removal Efficiency During Fixed Orthodontic Treatment

- Bonding molars instead of banding them, especially in adults
- Use single arch wires whenever possible
- Remove excess composite around brackets
- Reduce the use of lingual appliances
- Minimize the length of fixed appliance phase
- Enroll the patient in period/oral hygiene program with periodontist especially adults

Adults vs Children

There are:

- ✓ Biological,
- ✓ Clinical
- ✓ Psychological differences

Tissue response to orthodontic forces:

In adults:

- ✓ Cell mobilization and conversion of collagen fibers is much slower
- ✓ Hyalinized zones form more easily
- ✓ Growth and development have ceased

Ong & Wang, AJO, 2002

Tissue response to orthodontic forces

- More susceptible to periodontal diseases; regeneration stops in the presence of inflammation

- Teeth are more prone to root resorption during intrusion and after root canal treatment

Ong & Wang, AJO, 2002

Clinical Differences

- Effectiveness and duration of orthodontic treatment is similar to children

Robb et al, AJO-DO, 1998

- Medical status
- Centre of resistance is more apically positioned in peridontally compromised dentition
- Camouflage and surgery vs. growth modification
- Adjunctive Orthodontics
- Multidisciplinary treatment
- Stability and retention
- Sensitive to appliances

Psychological Differences

- The main chief complaint: desire to improve dental appearance (Proffit, 2000)

- Critical to:
  - Outcome of treatment
  - Type of appliance used
  - Duration of treatment

Recommendations

- Comprehensive medical and dental history taking
- Identify c.c. more carefully and work on it
- Comprehensive examination including TMJ
- Discuss treatment plan, risk factors, outcome and retention in more details
- Sign consent form
- Enroll patient in a periodontal program with periodontist
- Consider the envelope of tooth movement especially during camouflage treatment
- Consider the role of periodontal and orthognathic surgery
- Test the rate of tooth movement
- Treatment plan for the smile

Effective Method of Brushing

- **Step 1:** Holding the brush straight against the braces, scrub in small circles 10 times.

- **Step 2:** Holding the brush at an angle towards the chewing surface, scrub in small circles 10 times.

- **Step 3: This is the most important Step:** Holding the brush at an angle towards the gums, scrub in small circles 10 times. Make sure that the gumline is also being cleaned

- **Flossing With Braces:**

  Flossing with braces should be done once a day .A floss threader is very helpful in getting the floss under the archwire.

- **Flossing With Braces:**

  Another way to floss with braces is to use superfloss. One end is a floss threader and the other end can be used for flossing

- **Flossing With Braces:**

  The floss should be moved up and down along the sides of the teeth and under the gumline to remove the plaque.

Other Cleaning Techniques :

Proxy Brush, Sulca Brush, End Tuft Brush

Other Cleaning Techniques :

Electric Toothbrushes:

It was reported that 20% to 40% of orthodontic patients will not effectively remove all plaque using a conventional toothbrush.

Oral B-Braun and Interplak are examples

Water pick is also effective during orthodontic treatment

Other Cleaning Techniques:

In addition to the toothbrushes, patients can use a number of agents to help improve their gingival conditions (especially for non-compliant patients). These include:

1- Stannous fluoride : anti-gingivitis/ twice daily as needed/staining effect.

2- Listerine rinse:Mild anti-gingivitis/twice daily for 1 minute.

3- Tryclosan containing toothpaste such as Colgate Total/antigingivitis effect.

4- Chlorohexidine Rinses: Twice daily for 6 weeks/stain composite margins.

5- Others.

- Gingival Recession:
  - Always check and record any recession (thin gingiva or inadequate attached gingiva) before treatment
  - Orthodontic patients may experience greater gingival recession than untreated patients.
  - If tooth movement is in labial direction, labial recession should be grafted before treatment (Connective tissue graft)
  - If tooth movement is in palatal direction, there is a chance for the tissue to move corornally and become thicker. So grafting should be postponed after orthodontic treatment.
  - If ginigva and bone are very thin, then grafting should be done before any type of orthodontic treatment
  - If no orthodontic treatment is planned for children, width of attached gingiva should be monitored only periodically as the width of attached gingiva generally increases with growth.

Pre-Orthodontic Indication:
Very thin bone and gingiva

After the graft

After orthodontic treatment

Never move teeth in the presence of periodontal inflammation

Summary

Malocclusion is considered as a contributory factor (not a primary one)for gingival and periodontal disease as it facilitates plaque accumulation

Orthodontic appliances create traps for food around them, keeping plaque and food debris in close contact with the teeth and gingival tissues.

In general, maintaining good oral hygiene (in the absence of periodontal disease) during proper orthodontic treatment prevents significant long term deleterious effects on the periodontium.

Conversely, tooth movement in patients with active periodontitis may accelerate the disease progress even when oral hygiene is maintained.