1. The definition of Trauma From Occlusion: Primary TFO, Secondary TFO, and Combined TFO
2. Clinical and Radiographic signs of TFO
3. Pathologic tooth mobility: the primary causes, increased mobility vs increasing mobility
4. Indication of splinting
5. Pathologic tooth migration: etiologies
6. Posterior bite collapse: the definition and the causes
7. The relative importance of plaque and occlusion in periodontal disease

This is the last lecture from Dr. Oh.
Excessive force on normal periodontium

Normal force on inadequate periodontium

Combined force on weak periodontium

Trauma combined with periodontitis will cause more bone loss* Important

Will be clear on the radiograph if on an exam or case discussion that it is vertical bone loss

*Important to distinguish horizontal and vertical. Vertical bone loss you can do a bone graft

Memorize this - sometimes radiolucent, sometimes radiodense. Not very clear. Most important signs are widened PDL and vertical bone defect

Can see in canine and first molar - through to dentin, attrition. = clinical signs of TFO

Clinical Signs of TFO

- Increased tooth mobility
- Wear facets
Mobile implants are failed!

Tooth mobility happens due to PDL space = physiologic mobility that you should not be able to see clinically.

Clinically detectable mobility is pathological***

**Physiologic tooth mobility**
- The initial stage: where the tooth moves within the periodontal ligament space. This initial movement occurs with forces of 100 lb and is of the order of 0.02 to 0.1 mm (50 to 100 μm)
- The second stage: entails elastic deformation of the alveolar bone in response to increased horizontal forces.

**Pathologic Tooth Mobility**
- The primary causes
  - Loss of alveolar bone
  - Inflammatory changes in PDL
  - Trauma from occlusion
  - Periodical lesions
- Tooth mobility caused by inflammation and from TFO may be correctable.
- Tooth mobility resulting from loss of alveolar bone is not likely to be correctable.

Theory = two stages: 1. PDL stage. 2. bone itself
- Should not be able to see with naked eyes

*any detectable mobility is pathologic mobility

Trauma from occlusion = TFO. Might correctable
Endodontic infection will make a PA lesion around apex that can push the tooth itself up.

Tooth mobility from loss of bone might not be correctable because would have to make the bone.
Tooth mobility can be detectable by patients, but that isn’t consistent in literature.

Increased mobility not always found at teeth with severe bone loss.

Tooth might not be mobile at all.

**Important:** *Stable mobility will not affect future connective tissue attachment loss.*

*Increasing mobility will be contributing factor in progress of periodontitis.*

Increased and increasing mobility are not the same!

- Increased by stable = no effect on future CAL loss
- Increasing mobility = can’t control factors there. Need to know baseline to be able to detect. Need to correct baseline mobility when seeing patient for first time.

Not affect mobility or reverse of attachment.

All periodontal patients will have secondary occlusal trauma since periodontium weak and any force will become trauma.

- **How many cases need splinting?**
  - <10 - Dr. Oh believes clinical dentistry is about what you believe not what you know. She has done less than 5 up to now.
  - Patient might request it - patient comfort, emotionally or physically.

**Remember:** if asked on an exam, new answer for indication for splinting is patient comfort! NOT distributing occlusal forces

- Need to include strong teeth and do it across the midline
- Canines stronger than mandibular incisors - so include them and cross the midline = true splint.
- If just splint two central incisors, it will move again.

Even though Dr. Oh doesn’t really believe in splinting, she recommends some indications for it.

- Lots of mobility in baseline, after surgery it tends to increase a lot

Limited indications for splinting.
Remember them

Genetic and other factors affect tooth position.
Teeth will migrate when erupting ≠ physiologic tooth migration
Any other movement will be pathologic ≠ common among periodontal patients. Most common chief complaint to bring patients to dental clinic (ex. space between 8 and 9).

Pathologic Tooth Migration
• A change in tooth position that occurs when there is disruption of forces that maintain teeth in a normal relationship
• Prevalence between 30% - 56% among periodontal patients

Etiology of PTM
• Destruction of periodontal supporting tissues
• Occlusal Factors
• Soft Tissues Pressure

Destruction of periodontal supporting tissues
- PTM was associated with bone loss, tooth loss, and gingival inflammation
- Gingival overgrowth
- Periodontal and periapical inflammation

Tooth in the alveolar bone socket ≠ PDL, soft tissue attachments. If lose lots of bone support, will move somewhere.
Occlusal factors will affect position.

Summarizing force on teeth. Unbalancing in one of the factors mentioned, teeth will move to find a new place.

Based on severity of pathologic tooth migration,

Prognosis might be hopeless and need partial denture.

Light theory = space recently (less than 1 mm) can be corrected by itself after successful periodontal treatment.

Moderate = difficult. Need to spend lots of effort periodontally, prosthodontically, and restoratively.

Need to analyze data and determine severity and extent based on CAL = diagnosis. Check alveolar bone loss.

Hypo-occlusion - patient might not complain.
Crowns tend to have little to no occlusal contact.

Defined by person from Upenn when patient loses the first molar and can't replace, second molar drifts and extrudes. Affects the other segments even though in the posterior. They maintain vertical dimension and protect maxillary incisors.

Any force on anterior incisors is lateral force and can cause flares.
**Posterior bite collapse**

- What are the primary causes of posterior bite collapse?
  - Periodontal disease and dental caries
- What causes the anterior teeth to migrate in posterior bite collapse patients?
  - A loss of occlusal vertical dimension

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*The relative importance of plaque and occlusion in periodontal disease*

![Image](https://via.placeholder.com/150)


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**Lesions of Trauma and Initiation of Periodontal Disease**

- The findings from the studies with unidirectional and jarring forces showed that neither single nor repeated episodes of trauma initiated loss of connective tissue attachment.
- A jarring trauma was capable of causing:
  1. Some loss in crestal height of bone
  2. A marked reduction in volume of bone
  3. Changes in periodontal ligaments

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**Summary 1**

Traumatic lesions or their sequelae in the periodontal ligament will not initiate marginal periodontitis!!!!!
Lesions of Trauma and Progression of Marginal Periodontitis

- The influence of oral trauma upon an existing marginal periodontitis
- Glickman's co-destructive theory; several investigators tried to reproduce Glickman's findings but unsuccessfully.

Models for experimental marginal periodontitis

<table>
<thead>
<tr>
<th>In the squirrel monkey</th>
<th>In the beagle dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma + periodontitis</td>
<td>Trauma + periodontitis</td>
</tr>
<tr>
<td>Increased amount of alveolar bone loss</td>
<td>Increased amount of alveolar bone loss</td>
</tr>
<tr>
<td>It was unlikely aging trauma superimposed on the periodontitis had accelerated the loss of connective tissue attachment.</td>
<td>Trauma superimposed on marginal periodontitis to greater loss of connective tissue attachment.</td>
</tr>
</tbody>
</table>

Summary 2

- Trauma subject to periodontitis increases the amount of bone loss compared with periodontitis alone.
- No consensus regarding the effect on loss of connective tissue attachment

Lesions of Trauma and inflammation in Treatment of Periodontitis

What is the relative importance of inflammation and trauma in the management of marginal inflammation and tooth hypermobility?

- Elimination of trauma in the presence of existing marginal inflammation did not reduce the tooth mobility or increase bone volume.

Candidates for systemic antibiotic therapy

- Patients who exhibit continuing loss of periodontal attachment despite diligent mechanical periodontal therapy
- Recurrent or refractory periodontitis
- Aggressive periodontitis
- Patients with medical conditions predisposing to periodontitis
- Patients with acute or severe periodontal infections

Scaling and Root Planning

- Scaling: Instrumentation of the crown and root surfaces of the teeth to remove plaque, calculus, and stains.
- Root planing: Definitive treatment procedure to remove cementum or dentin that is rough, impregnated with calculus or contaminated with bacteria or microorganisms.

Inflammation and occlusion always existing in patient's mouth

Most important to control first is inflammation - this is a perio lecture.
If occlusion was more important, another class would be presenting this.
Research says inflammation component is more important.

Second question:

TFO not initiating periodontal disease, but what does it effect on existing periodontitis?

Two groups with different conclusions for connective tissue attachment, but open does influence bone loss.

Can we move these teeth? - not currently.
What Dr. Oh did - existing restoration wasn't good, lots of overhanging and not fitting margin.
So said need to replace it - opened her vertical dimension.

Most orthodontic movement - might not be the correct way, but it is what Dr. Oh did.

After 5 months, tooth intruded - used to be a contraindication 10 years ago or so, which is why no orthodontist would want to do this.
Periodontal compromised tooth moves quickly.

Final restorations = true splinting. Three segments of prosthetics for splinting:
Cannot make one piece = path of insertion difficulties. Need attachments to attach them.

Root planing is more definitive procedure than scaling.
- Different meaning but we use one code.
Periodontal treatment is based on quadrants - four or more teeth.

Will do instrumentation of all teeth in that quadrant.

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8 intruded and periodontally compromised - more tendency to relapse without retainer.
Mandibular = Dr. Oh increased vertical dimension and opened the bite. So also splinted this.
Denture made - prosthodontist.

Conclusion
Periodontal disease management on a clinical level:
Decreased emphasis upon management of tooth mobility and increased emphasis upon resolution of marginal inflammation!!!