Tannslitasje-pasienten

veivalg hvis årsaken er primært mekanisk eller på grunn av syreangrep

Asbjørn Jokstad
Prosthodontics
Dental lesions

Carious etiology
Non-carious etiology
  Developmental
  Toxic
  Hereditary
Acquired
  Discoloration
  Fracture
(Tooth) Surface lesions
Management?
Tooth surface lesions

Erosion (clinical diagnosis)

*Original Definition:* Progressive loss of hard dental tissue by chemical processes not involving bacterial action
Erosion:
ASTM: American Society for Testing & Materials Committee on Standards:

"The progressive loss of a material from a solid surface due to mechanical interaction between that surface and a fluid, a multicomponent fluid, impinging liquid or solid particles"
Erosion examples:
Tooth surface lesions

Erosion  Corrosion!

‘Progressive loss of hard dental tissue by chemical processes not involving bacterial action’
Erosion  Corrosion:

grade 1

grade 2

grade 3
Tooth surface lesions

Erosion  Corrosion

\[\times\]

Abrasion \ (\text{clinical diagnosis})

‘Loss by wear of dental tissue caused by friction of a foreign substance (dentifrice, toothbrush, objects)”
Tooth surface lesions

Erosion  Corrosion  Abrasion

Attrition  (clinical diagnosis)

‘Loss by wear of surface of tooth or restoration caused by tooth to tooth contact during mastication or parafunction’
Tooth surface lesions

- Erosion
- Corrosion
- Abrasion
- Attrition

Abfraction (clinical diagnosis)

“Loss of tooth surface at the cervical areas of teeth believed to be caused by tensile and compressive forces during tooth flexure”
Mechanisms: Tooth surface lesions

**STRESS**
- [Microfracture/Abfraction]
  - Endogenous
  - Exogenous

**FRICTION**
- [Wear]
  - Endogenous (Attrition)
  - Exogenous (Abrasion)

**CORROSION**
- [Chemical Degradation]
  - Endogenous
  - Exogenous

Grippo et al. JADA 2004 135; 1109
Mechanisms: Tooth surface lesions

STRESS
[Microfracture/Abfraction]
Endogenous
Exogenous

FRICTION
[Wear]
Endogenous
Attrition
Exogenous
Abrasion

CORROSION
[Chemical Degradation]
Endogenous
Exogenous

Endogenous:
- Parafunction
- Occlusion
- Deglutition

Exogenous:
- Mastication
- Habits
- Use of Dental appliance

Endogenous: Plaque – gingival crevicular fluid – Gastric juice
Exogenous: Diet - Occupational exposures - Certain drugs/alcohol
Patient management - Strategy 1

1. Establish status
2. Restore
   Carious & non-carious lesions
Patient management - Strategy 1

Symptomatic
1. Establish status
2. Restore
carious & non-carious lesions

Diagnosis and etiology is of limited interest.
...perhaps only for the sake of guessing prognosis...

DANGER:
Unpredictive treatment outcome!
Patient management - Strategy 2

Symptomatic
1. Establish status
2. Restore carious & non-carious lesions

Diagnosis and etiology is of limited interest. Perhaps only for the sake of estimating prognosis.

Causal
1. Diagnose correctly
   Carious vs non-carious lesions
2. Identify etiology
   a. carious
   b. non-carious lesions
3. Restore
   Carious & non-carious lesions
4. Reduce risk
   a. carious
   b. non-carious lesions
Diagnosis
Abrasión-attrition-corrosion?
Abfraction-abrasion-corrosion?
Abrasion-corrosion?
Abrasion-corrosion?
Abrasion–attrition–corrosion?
Abfraction-abrasion?
Attrition-corrosion?
“demastication”
Corrosion – clinical appearance (anterior)

- Broad concavities within smooth surface enamel
- Increased incisal translucency
- Wear on non-occluding surfaces
- Loss of surface characteristics of enamel (perikymata) in young children
- Preservation of enamel "cuff" in gingival crevice is common
- Hypersensitivity
Corrosion – clinical appearance (posterior)

- Cupping of occlusal surfaces, (incisal grooving) with dentin exposure
- Wear on non-occluding surfaces
- "Raised" amalgam restorations
- Clean, non-tarnished appearance of amalgams
- Preservation of enamel "cuff" in gingival crevice is common
Abrasion – clinical appearance

- Usually located at cervical areas of teeth
- Lesions are more wide than deep
- Premolars and cuspids are commonly affected
Attrition – clinical appearance

- Matching wear on occluding surfaces
- Shiny facets on amalgam contacts
- Enamel and dentin wear at the same rate
- Possible fracture of cusps or restorations
Attrition vs corrosion
Abfraction – clinical appearance

- Affects buccal / labial cervical areas of teeth
- Deep, narrow V-shaped notch
- Commonly affects single teeth with excursive interferences or eccentric occlusal loads
## Cervical loss

<table>
<thead>
<tr>
<th>Locations: Ling./Bucc.</th>
<th>Buccal</th>
<th>Buccal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form: U</td>
<td>Wedge</td>
<td>V-form</td>
</tr>
<tr>
<td>Edge: smooth</td>
<td>sharp</td>
<td>sharp</td>
</tr>
<tr>
<td>Enamel: smooth</td>
<td>smooth/rough</td>
<td>rough</td>
</tr>
<tr>
<td></td>
<td>often slightly polished</td>
<td></td>
</tr>
</tbody>
</table>

### Probably:

- Abrasion
- Abfraction

- Sometimes subgingival
Abfraction vs Abrasion
1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      ➢ Carious vs non-carious lesions

2. Identify etiology (causes)
   ➢ (a. carious) & b. non-carious lesions
1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      ➢ Carious vs **non-cariou**s lesions

2. Identify causes
   ➢ (a. carious) & b. **non-cariou**s lesions

3. Restore
   ➢ carious & **non-cariou**s lesions
When to restore: Factors to consider

- Size of lesion
- Location of lesion
- Tooth lesion Etiology
- Biomechanic (force)
- Diagnostic protocol
- Esthetic concern
## Restorative material Alternatives

<table>
<thead>
<tr>
<th></th>
<th>Veneer</th>
<th>GIC</th>
<th>GIC-hybrid</th>
<th>Composite resin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esthetics</td>
<td>++</td>
<td>-</td>
<td>-/+</td>
<td>+</td>
</tr>
<tr>
<td>Biological cost</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Acid resistance</td>
<td>++</td>
<td>--</td>
<td>-/+</td>
<td>+</td>
</tr>
<tr>
<td>Wear resistance</td>
<td>++</td>
<td>-</td>
<td>-/+</td>
<td>+</td>
</tr>
<tr>
<td>Longevity</td>
<td>++</td>
<td>--/+</td>
<td>-/+</td>
<td>--/+</td>
</tr>
</tbody>
</table>

*Note: ++: Excellent, -: Poor, +/+: Mixed.*
Restorative planning

- Tooth preparation
  - Minimal extension
  - Supragingival margins
  - No extra undercuts or retention lock
  - Estimated force
    - No compression versus flexure of tooth
    - Wear type
  - Esthetics on anterior teeth and premolars
1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      - Carious vs non-carious lesions

2. Identify causes
   - (a. carious) & b. non-carious lesions

3. Restore
   - carious & non-carious lesions
   - Restoration
      - Composites & Bonding
Abfraction vs. Abrasion

Glassionomer or microfill composite resin

Hybrid microfill composite resin
Glassionomer cement-resin hybrids

Two subgroups
a. Material polymerises without light initiation
b. Light initiation is required

Most products contains 4.5%-6% resin
Selection of restorative material? Composite resin vs. glassionomer

Cavity situation:
- Supragingival margin: moisture sensitive
- Cementum gingival margin
- Dentin substrate: sclerotic dentin(?), depth of preparation, tubule orientation

Etiology:
- High caries risk: need for F-
- Cervical abrasion: wear
- Abfraction: flexion
1. Diagnose correctly
   1. Diagnostic Protocol
   2. Types of lesions
      ➢ Carious vs non-carious lesions

2. Identify causes
   ➢ (a. carious) & b. non-carious lesions

3. Restore
   ➢ carious & non-carious lesions
   ➢ Restoration
      ➢ Composites & Bonding

4. Reduce risk
   ➢ (a. carious) & b. non-carious lesions
Risk reduction: Corrosion

Diminish frequency & severity of acid challenges

- Decrease amount/frequency of acidic foods/drinks
- Acidic drinks should be drunk quickly rather than sipped. The use of a straw would reduce the corrosive potential of soft drinks
- If undiagnosed/poorly controlled gastroesophageal reflux is suspected, refer to a physician
- In the case of bulimia, a physician or psychologist referral is appropriate
- A patient with alcoholism should be assisted in seeking treatment in rehabilitation programs
Risk reduction: Corrosion

Enhance acid resistance, remineralization and rehardening of the tooth surfaces

- Have the patient use daily topical fluoride at home
- Fluoride can be applied in the office 2-4 times a year. A fluoride varnish is recommended

Improve chemical protection

- Neutralize acids in the mouth by dissolving sugar-free antacid tablets 5 times a day, particularly after an intrinsic or extrinsic acid challenge
- Dietary components such as hard cheese (provides calcium and phosphate) can be held in the mouth after acidic challenge (e.g., hold cheese in mouth for a few minutes after eating a fruit salad)
Risk reduction: Corrosion+Friction

Enhance the defense mechanisms of the body (increase salivary flow and pellicle formation)

- Saliva provides buffering capacity that resists acid attacks. This buffering capacity increases with salivary flow rate. Saliva is also supersaturated with calcium and phosphorus, which inhibits demineralization of tooth structure.
- Saliva reduces tooth friction.
- Stimulation of salivary flow by use of a sugarless lozenge or chewing gum should be encouraged.
Risk reduction : Friction

Decrease abrasive forces

- Use soft toothbrushes and dentifrices low in abrasiveness in a gentle manner
- Do not brush teeth immediately after an acidic challenge to the mouth, as the teeth will abrade easily
- Rinsing with water is better than brushing immediately after an acidic challenge
Risk reduction: friction, stress, corrosion

**Decrease abrasive forces**
- Gentle use of soft toothbrushes and dentifrices low in abrasiveness
- No brushing immediately acidic challenges
- Rinsing with water after an acidic challenge

**Provide mechanical protection**
- Consider application of composites and direct bonding where appropriate to protect exposed dentin
- Construction of an occlusal guard is recommended if a bruxism habit is present