The Finer Points of Intracoronal Restorations

Norman Tinanoff
Ava Roberts Course
August 19, 2016

Outline

Decisions to Treat
Class I
- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal
Class II
- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations

Decisions for Treatment

Past – Clinical/radiographic identification of a lesion.

Present – Decisions are complex involving understanding the natural history of the carious process, better diagnosis of disease, risk assessment, evidence of outcomes, ability of an individual to change their risk and informed consent.

False Negative – explorer does not stick, but caries in dentin
False Positive - explorer sticks in fissure

With the Visual-Tactile (Mirror-Explorer) Criteria in Fissure Caries

Sensitivity = Ability of a diagnostic test to correctly identify those teeth that have caries (39% sensitivity means that 61% of the time the lesion was not detected) – false negative

Specificity = Ability of a diagnostic test to correctly identify those teeth that do not have caries (94% specificity means that 6% of the time a lesion was identified that was not really there) – false positive

Different Criteria for Fissure Caries

Knowing that sealants arrest undetected and small enamel caries, can we move to criteria?

- Is there a hole in the tooth?
- Is there shadowing under the enamel?
- Is there radiolucency evident on bitewings?

Different Criteria for Fissure Caries

Treatment Planning Fissure Caries

<table>
<thead>
<tr>
<th>LOW RISK</th>
<th>MODERATE RISK</th>
<th>HIGH RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restorative Therapy</td>
<td>None</td>
<td>Sealants Restoration of cavitated lesions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restoration of fissures with shadowing</td>
</tr>
</tbody>
</table>
Outline

Decisions to Treat
Class I
– Primary and Permanent Teeth
  – Amalgam
  – Composite
  – Incomplete Caries Removal
Class II
– Amalgam
– Composite
– Critical Issues

Principles of Preparations in Primary Teeth

- Smaller preparations due to smaller teeth.
- Shallower preparation (just into dentin)
- Internal angles rounded to reduce internal stress

Outline

Decisions to Treat
Class I
– Primary and Permanent Teeth
  – Amalgam
  – Composite
  – Incomplete Caries Removal
Class II
– Amalgam
– Composite
– Critical Issues

Advantages of Amalgam Restorations

- Less technique sensitive; better predictability of success
- Able to be placed without absolute moisture control
- Better wear resistance, especially in areas of occlusion
- Cheaper than composite materials
- Quicker than composites
- Some clinical trials in children show greater life span
Amalgam preparations – Include fissures in preparation
Conservative preparation that includes all fissures
Outline

Decisions to Treat

Class I
- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal

Class II
- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations

Advantages of Composite Restorations
- Leakage less, especially with dentin bonding
- Better aesthetics
- No concern about mercury
- Lower thermal conductivity
- Bonds tooth together
- Do not have to remove as much tooth structure

Treating the Routine Fissure Carious Lesion
Treating Fissures with Shadows
Caries Spread in the Dentin

Caries Removed

Initial Layer of Flowable Composite

Partially Filled with Flowable Composite
Completed with Filled Resin

Sealant over Composite Restoration

Completed Class I Restorations

Outline

Decisions to Treat

Class I

- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal

Class II

- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations
Treating Deep Caries – Incomplete Caries Removal

Less Pulp Exposures

Failures
Outline Carious Lesion with a Football Diamond

Caries Outlined

Remove Soft Caries

Woody Dentin Over Pulp Not Removed
Outline

Decisions to Treat
Class I
- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal

Class II
- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations

With the Radiographic Criteria of Enamel Proximal Lesions

Sensitivity = Ability of a diagnostic test to correctly identify those teeth that have caries (30% sensitivity means that 70% of the time the lesion was not detected) — false negative

Specificity = Ability of a diagnostic test to correctly identify those teeth that do not have caries (76% specificity means that 24% of the time a lesion was identified that was not really there) — false positive
## Treatment Planning Proximal Caries

<table>
<thead>
<tr>
<th>Restorative Therapy</th>
<th>LOW RISK</th>
<th>MODERATE RISK</th>
<th>HIGH RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>Monitor enamel proximal lesions</td>
<td>Restoration of enamel proximal lesions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restoration of progressing lesions</td>
<td>Restoration of progressing lesions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Restoration of cavitated lesions</td>
<td>Restoration of cavitated lesions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aggressive treatment to minimize continued caries progression</td>
</tr>
</tbody>
</table>

Isthmus = 1/3 to ½ intercuspal distance

## Outline

### Decisions to Treat

**Class I**
- Primary and Permanent Teeth
  - Amalgam
  - Composite
  - Incomplete Caries Removal

**Class II**
- Amalgam
- Composite
- Critical Issues

**Restorative Materials for Intracoronal Restorations**

Proximal lesions on distal of first and mesial of second molars
Dove Tails

Bonding Agent

Small Drop of Flowable Composite in Proximal Box

Filled with Condensable Composite
Complete and Finish One Restoration

Outline
Decisions to Treat
Class I
- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal

Class II
- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations

Which lesions need to be restored?; Which will progress?
15 months later
Iatrogenic Adjacent Tooth Damage

- 97% of adjacent teeth had a preparation trauma
- Statistical significant increase of damage was found on distal surfaces
- Operative time operative treatment was performed on 10% of the undamaged test surfaces and on 35% of the damaged ones


Outline

Decisions to Treat

Class I
- Primary and Permanent Teeth
- Amalgam
- Composite
- Incomplete Caries Removal

Class II
- Amalgam
- Composite
- Critical Issues

Restorative Materials for Intracoronal Restorations

Restorative Materials – Primary Teeth

<table>
<thead>
<tr>
<th></th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Class V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amalgam</td>
<td>Strong Evidence</td>
<td>Strong Evidence</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>Composite</td>
<td>Strong Evidence</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td></td>
</tr>
<tr>
<td>Glass Ionomer</td>
<td>Strong evidence **</td>
<td>Against</td>
<td>Evidence in Favor</td>
<td>No Data</td>
<td>Expert opinion for</td>
</tr>
<tr>
<td>RMGIC</td>
<td>Strong Evidence</td>
<td>Evidence in Favor</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td></td>
</tr>
<tr>
<td>Compomers</td>
<td>Evidence in Favor</td>
<td>Evidence in Favor</td>
<td>No Data</td>
<td>No Data</td>
<td>Expert opinion for</td>
</tr>
<tr>
<td>SSC</td>
<td>Strong Evidence ***</td>
<td>Strong evidence ***</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td></td>
</tr>
<tr>
<td>Anterior</td>
<td>N/A</td>
<td>N/A</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td></td>
</tr>
<tr>
<td>Crowns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Restorative Materials – Permanent Teeth

<table>
<thead>
<tr>
<th></th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
<th>Class IV</th>
<th>Class V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amalgam</td>
<td>Strong Evidence</td>
<td>Strong Evidence</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>Composite</td>
<td>Strong Evidence</td>
<td>Evidence in Favor</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td></td>
</tr>
<tr>
<td>Glass Ionomer</td>
<td>Strong evidence</td>
<td>Against</td>
<td>Expert opinion for</td>
<td>No Data</td>
<td>Expert opinion for</td>
</tr>
<tr>
<td>RMGIC</td>
<td>Expert opinion for</td>
<td>Expert opinion for</td>
<td>No Data</td>
<td>No Data</td>
<td>Evidence in Favor</td>
</tr>
<tr>
<td>Compomers</td>
<td>Evidence in Favor</td>
<td>Evidence in Favor</td>
<td>No Data</td>
<td>No Data</td>
<td>Expert opinion for</td>
</tr>
<tr>
<td>SSC</td>
<td>N/A</td>
<td>N/A</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>Anterior</td>
<td>N/A</td>
<td>N/A</td>
<td>No Data</td>
<td>No Data</td>
<td>No Data</td>
</tr>
<tr>
<td>Crowns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Anterior Crowns ***

N/A
Initial placement

Polish – 1 week later

One year later