Restorative Dentistry in Primary Teeth – Intercoronal Restorations and Stainless Steel Crowns

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Outline

Decisions to Treat

Class I
- Amalgam
- Composite
- Incomplete Caries Removal

Class II
- Amalgam
- Composite

Restorative Materials for Intercoronal Restorations

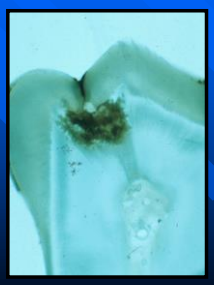
Stainless Steel Restorations

Decisions for Treatment

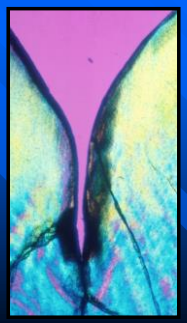
Past – Clinical/radiographic identification of a lesion.

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 visual criteria? --

- Is there a hole in the tooth?
- Is there shadowing under the enamel?

Treatment Planning Fissure Caries

	LOW RISK	MODERATE RISK	HIGH RISK
Restorative Therapy	None	Sealants Restoration of cavitated lesions Restoration of fissures with shadowing	Sealants (with caution) Restoration of cavitated lesions Restoration of fissures with shadowing.

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Class I

- Composite
- Incomplete Caries Removal

Class II

- Amalgam
- Composite
- Critical Issues

Differences between primary and permanent teeth

Differences between primary and permanent teeth

Principles of Preparations in Primary Teeth

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

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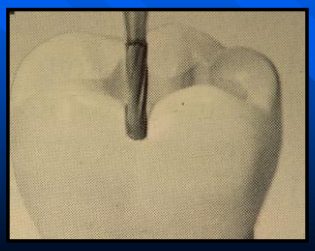
Restorative Materials for Intercoronal Restorations

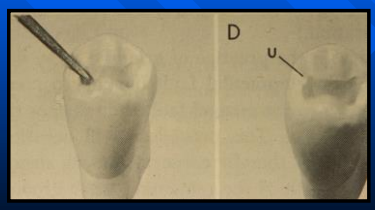
Stainless Steel Restorations

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

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Restorative Materials for Intercoronal Restorations

Stainless Steel 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

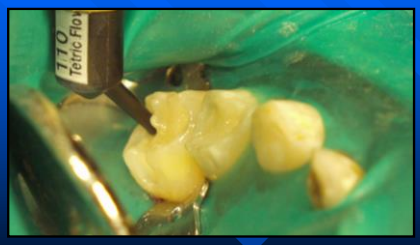
Treating the Routine Fissure Carious Lesion

Treating Fissures with Shadows

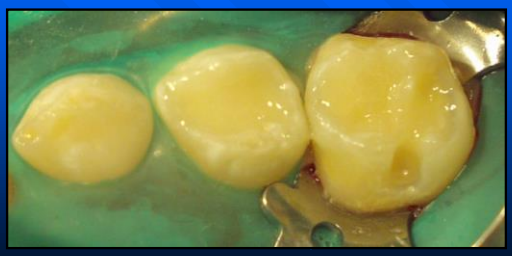
Caries Spread in the Dentin

Caries Removed

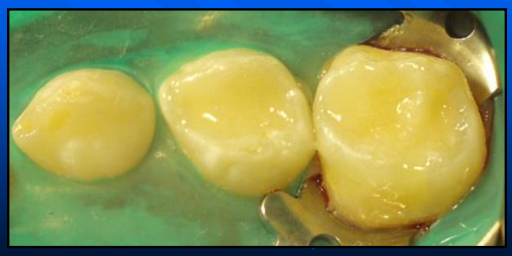
Initial Layer of Flowable Composite



Partially Filled with Flowable Composite



Completed with Filled Resin



Sealant over Composite Restoration

Completed Class I Restorations

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Restorative Materials for Intercoronal Restorations

Stainless Steel Restorations

Treating Deep Caries – Incomplete Caries Removal

CLINICAL REVIEW

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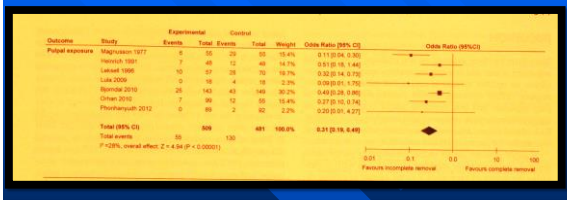
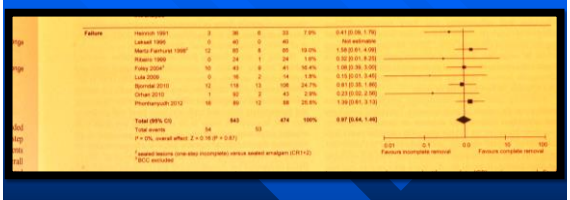
J Dent Res 92(4):306-314, 2013

Incomplete Caries Removal: A Systematic Review and Meta-analysis

Less Pulp Exposures

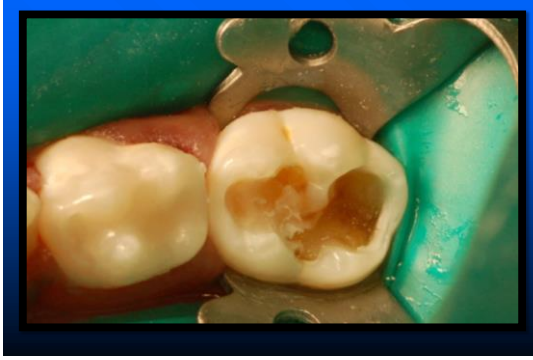


Failures

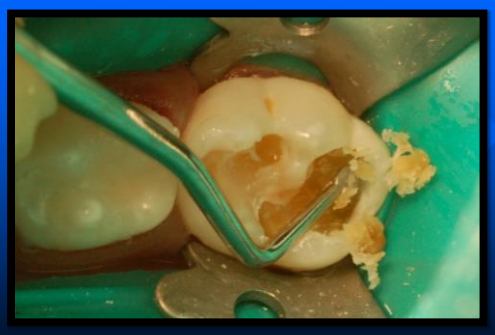


Outline Carious Lesion with a Football Diamond

Caries Outlined



Remove Soft Caries



Woody Dentin Over Pulp Not Removed

Base of Glass Ionomer

Restoration

Outline

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Restorative Materials for Intercoronal Restorations

Stainless Steel 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

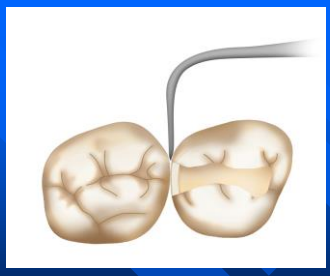
Specificity = Ability of a diagnostic test to correctly identify those teeth that do not have caries (76% specificity means that 24% of the time a lesion was identified that was not really there) – false positive

Treatment Planning Proximal Caries

	LOW RISK	MODERATE RISK	HIGH RISK
Restorative Therapy	None	Monitor enamel proximal lesions Restoration of progressing lesions Restoration of cavitated lesions	Restoration of enamel proximal lesions Restoration of progressing lesions Restoration of cavitated lesions Aggressive treatment to minimize continued caries progression

Principles of Class II Amalgam Restorations in Primary Teeth

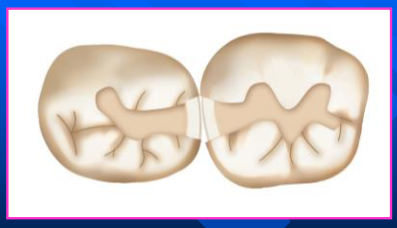
- Isthmus should be wide enough to join occlusal and proximal preparations
  - buccal and lingual walls point to center of tooth
  - Pulpal axial wall rounded
- Buccal, lingual, and gingival walls of proximal box should just clear contact
- Retention in box from convergence of buccal and lingual walls, not from retention grooves
- Width of proximal box should not exceed 1.5 mm



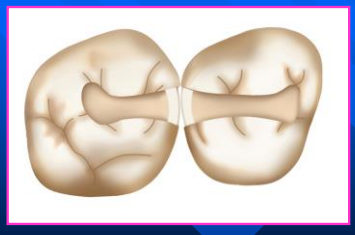
Proximal box 1.5mm:

Just break contact, gingivally, buccally and lingually

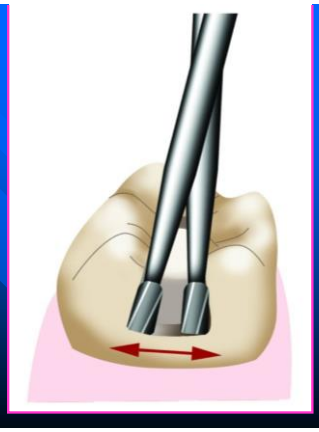
Isthmus= 1/3 to ½ intercuspal distance

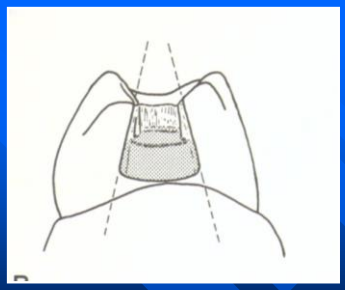


Isthmus= 1/3 to ½ intercuspal distance



Proximal box preparation with the bur moving buccal and lingual





- Internal angles rounded, including pulpal axial line angle
- Box preparation follow external anatomy, converging buccal and lingual walls

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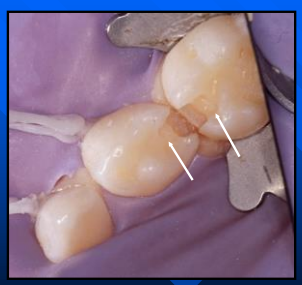
Restorative Materials for Intercoronal Restorations

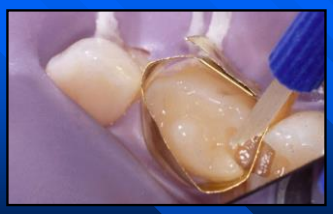
Stainless Steel Restorations

Proximal lesions on distal of first and mesial of second molars

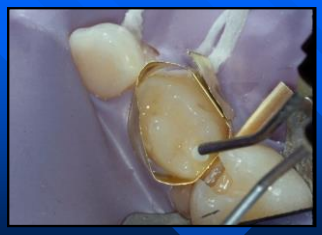
Dove Tails



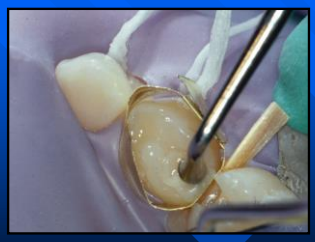
Bonding Agent



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
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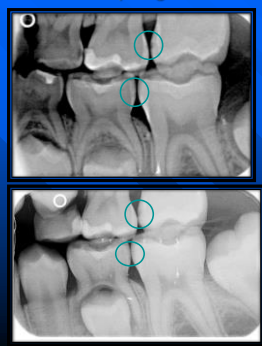
- Critical Issues

Restorative Materials for Intercoronal 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
- statistically significant increase of damage was found on distal surfaces
- Over time operative treatment was performed on 10% of the undamaged test surfaces and on 35% of the damaged ones

Journal of Dentistry 2003; 31: 291-296; J Dent Res 1992; 71: 1370-1373

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Restorative Materials for Intercoronal Restorations

Stainless Steel Restorations

Restorative Materials -- Primary Teeth

	Class I	Class II	Class III	Class IV	Class V
Amalgam	Strong Evidence	Strong Evidence	No Data	No Data	No Data
Composite	Strong Evidence	Expert opinion for	Expert opinion for	No Data	Expert opinion for
Glass Ionomer	Strong Evidence **	Against	Evidence in Favor	No Data	Evidence in Favor
RMGIC	Strong Evidence	Evidence in favor	Expert opinion for	No Data	Expert opinion for
Compomers	Evidence in favor	Evidence in favor	No Data	No Data	Expert opinion for
SSC	Strong Evidence ***	Strong evidence ***	Expert opinion for	Expert opinion for	Expert opinion for
Anterior Crowns	N/A	N/A	Expert opinion for	Expert opinion for	Expert opinion for

Restorative Materials – Permanent Teeth

	Class I	Class II	Class III	Class IV	Class V
Amalgam	Strong Evidence	Strong Evidence	No Data	No Data	No Data
Composite	Strong Evidence	Evidence in Favor	Expert opinion for	Expert opinion for	Evidence in Favor
Glass Ionomer	Strong evidence*	Against	Expert opinion for	No Data	Expert opinion for
RMGIC	Expert opinion for	Expert opinion against	Expert opinion for	No data	Evidence in favor
Compomers	Evidence in favor	No Data	Expert opinion for	No Data	Expert opinion for
SSC **	No Data	No Data	No Data	No Data	No Data
Anterior Crowns ***	N/A	N/A	No Data	No data	No data

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Restorative Materials for Intercoronal Restorations

Stainless Steel Restorations

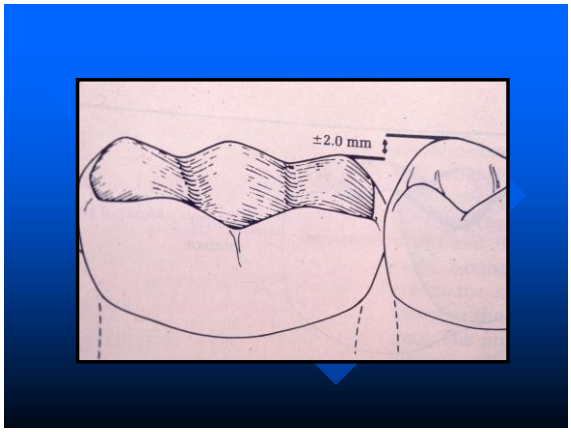
3 M Crowns

Unitec Crowns

Unitec

3M

Hu-Friedy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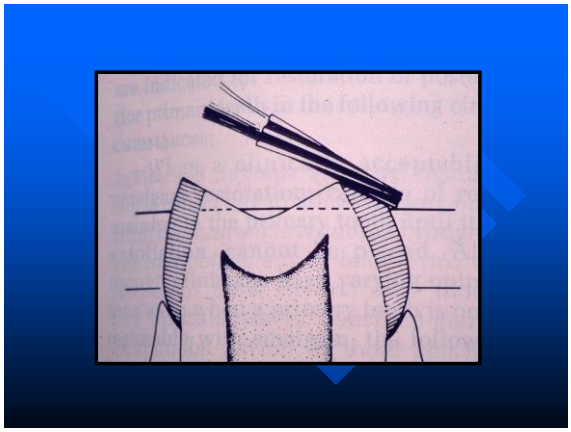
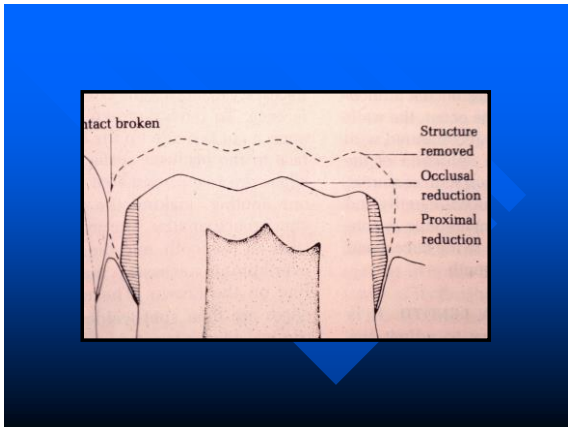
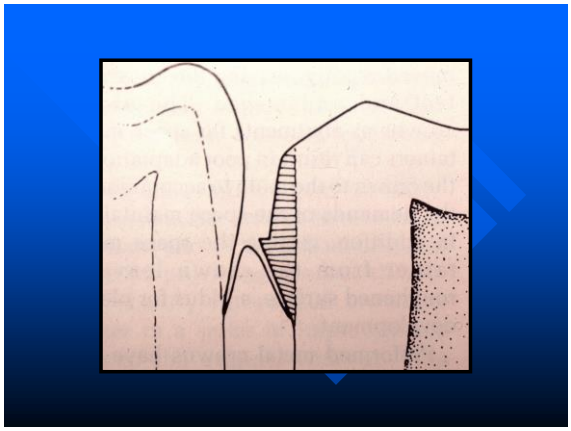
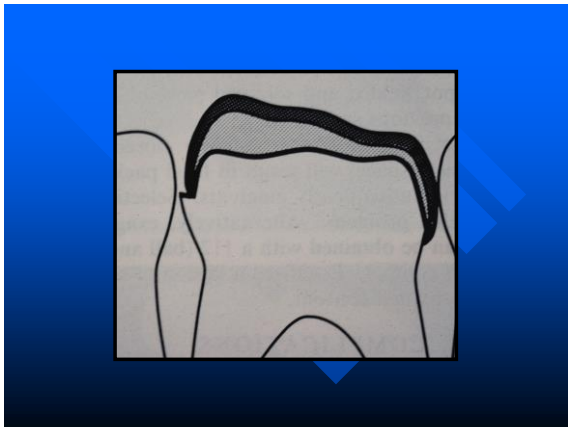
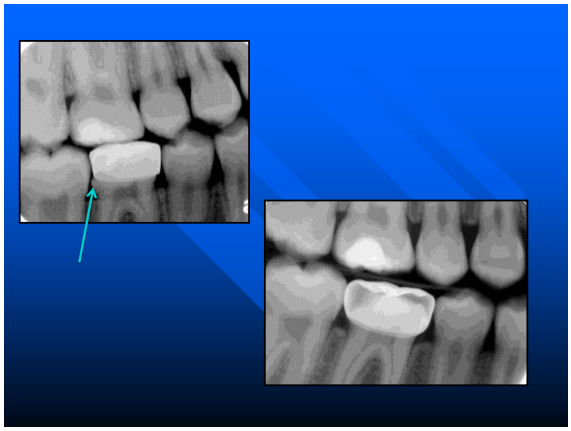
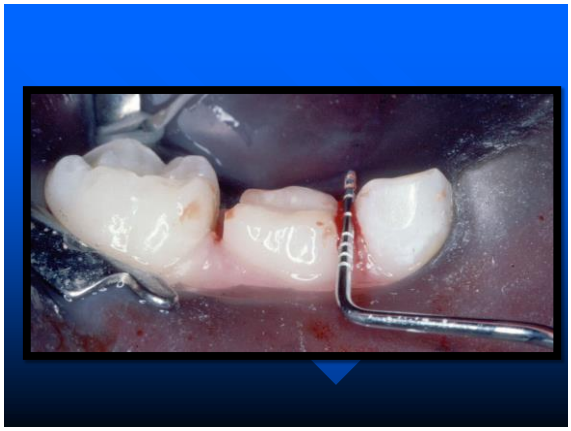



ıtact broken
Structure removed
Occlusal reduction
Proximal reduction







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