Sealing Non-Cavitated Caries Lesions: Implications For Practice

Margherita Fontana, DDS, PhD
Indiana University School of Dentistry
Department of Preventive and Community Dentistry
“Improved caries detection and diagnostic methods would help determine the appropriate cutpoint or threshold separating the clinical decisions to do nothing or preventively seal, or to therapeutically seal or surgically treat and restore”

(Weintraub, 2001)
Progress of Mineral Loss/Detection

Disease

(White Spot) -> Treatment

Disease

Treatment?
White spots can also be in dentin....

mfontan, 2/25/2005
What Level Of Assessment Do We Need For Sealant Placement In Any Setting?

Fejerskov, 2004
Variety of options change by setting, but the scientific evidence supporting management strategies should be the same.
Professional leadership has advocated that any fissure lesion judged to be limited to enamel is a candidate for sealant therapy (Siegel, 1995, 2002)

Can we judge when caries is in enamel?

Is the presence of cavitation a more practical sign of the need for operative intervention?
Indications for Occlusal Sealants

- On sound, at risk surfaces
- To arrest questionable or non-cavitated (incipient) caries lesions

What is a non-cavitated caries lesion?
**White Spot /Non-Cavitated Lesion:**

It is a subsurface lesion

**Stages of the Disease**

- Internal loss of minerals
- External (outer) surface
Stages of the Disease

**Cavitated Lesion (Cavity):**

☑️ A caries lesion that has lost the outer surface (leading to a discontinuity in the surface)
What is referred to as a cavity in need of operative intervention, based on the previous slide by Kidd, may change with magnification.
Scientific Evidence for Caries Detection

- 2001 NIH Consensus Development Conference - Systematic Review
- ICDAS II
- Selected studies
“At this time the panel senses a paradigm shift in the management of dental caries toward improved diagnosis of early non-cavitated lesions and treatment for prevention and arrest of such lesions”


What level of assessment do we need for sealant placement in School-Based Programs?
“Clearly, since our diagnostic methods for assessing pit and fissure caries have been up to this time basically an educated guess, we must be placing sealants almost routinely over undetected incipient lesions” (Simonsen, 2002)
Ekstrand et al., modified by ICDAS (Ann Arbor), 2002; further modified by ICDAS (Baltimore) 2005
Probing with Sharp Explorer...

Traditional probing with a sharp explorer has come into question as the ultimate determinant of caries activity. The exclusive use of a “catch” by the sharp explorer to diagnose caries in pit and fissure sites should be discontinued and clinicians are being called upon to use “sharp eyes and a blunt explorer.” Also non-cavitated lesions can become cavitated simply through pressure from the explorer during the typical examination.

Treating caries as an infectious disease. JADA 125 (June): 2-S to 15-S (1995)

Ekstrand et al., 1987
Magnification is not necessary to detect lesions using the ICDAS-2 criteria. Its use may affect the interpretation of the histological findings in relation to the criteria developed to correlate with it. For example, a category 2 tooth could be viewed as a category 3 under magnification, and this would result in more teeth being eliminated from consideration of sealants.
Radiographs show that demineralization is present, but when looked at in one period of time they cannot determine ACTIVITY.

Incidence of interproximal lesions in 2-3 graders is low.

The ICDAS-2 criteria recognizes that some of the non-cavitated stages of the caries disease process may have already progressed into dentin.
How do we assess cavitated vs. non-cavitated lesions?

- Visual assessment is appropriate
- Teeth can be dried with cotton rolls, gauze, or compressed air
- Explorer may be used to clean the fissures and “gently” confirm cavitations (i.e., breaks in the continuity of the surface); do not use sharp explorer under force
- Magnification (2x-4x) can be used, but is not required
- Radiographs are unnecessary, especially in programs targeting children in grades 2 – 3
- Insufficient evidence to recommend other technologies to determine presence or absence of cavitation
We suggest that you enlarge graphic "evaluate pit and fissure surfaces" and then bring each bullet in and then fade that bullet before bringing in the next bullet. In this way you will only need space for the questions and one answer at a time.

Barbara Finigan Gooch, 4/17/2007
Thank You
What is the Caries Disease Process?

The metabolic activity of the biofilm on the surface is the driving force...
...and/or is it the infected dentin once the lesion cavitates?
Reduction in Bacteria Counts by Time since Sealant Placement

(Griffin et al., 2007)

- The percentage reduction in mean bacteria counts (4 studies) ranged from 50.8% to 99.9% and appeared to increase as time since sealant placement increased.
Dental Sealants

Sealing infected dentin changes the oral environment (Kidd, 2004):

- encourages arrest of demineralization,
- tubular sclerosis and tertiary dentin are encouraged,
- dentin permeability is reduced,
- residual microorganisms are now in a different environment (do they change? how do they survive?)...they may become irrelevant!
Implications for Practice

Sealing non-cavitated lesions is an appropriate management alternative for these lesions.
Thank you...