Conservative Dentistry

Lecture No.7

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**Slide #42**

* Root caries: Caries on any exposed surface of tooth’s root.
* Actinomyces is the dominant bacteria in gingival tissues,this type of bacteria is the main causative agent for root caries in cases of exposed root to oral cavity.
* Factors facilating root caries (lead to the exposure):

1. Gingival recession: This could be normal or due to periodontal treatment or periodontal grafting (Periodontal grafting: The procedure that can be used to cover roots or to produce periodontal tissues where absent)
2. Poor oral hygiene:Mostly seen in old Pts. Due to reduction of salivary flow on the exposed root in comparison with the coronal part. Hence reduction of mechanical washing.
3. Anatomic surface contours:this leads to some difficulties in oral hygiene.
4. Lack of rubbing by food boluses.

* Root surface is covered with cementum which is less mineralized in comparison with enamel that covers the crown,thus demineralization of cementum occurs after being exposed to higher PH (lower acidity). (Enamel needs higher acidity for demineralization)

**Slide #43**

* Root caries should be considered as an alarm for these reasons:

1. Rapid progression:As we mentioned before dentin and cementum are less mineralized than enamel and this prevents delaying of caries.
2. Often Asymptomatic :So there’s no pain to alarm you.
3. Close to the pulp: The pulp is closer to the root surface than to the crown surface .
4. Difficult to be restored: for many reasons,

* Usually root caries are anteriorly so amalgam cant be used.
* Composite needs enamel for adherence (So we cant use it to restore roots)

So,Glass ionomer (GI) is our choice due to its ability to adhere chemically.

**Slide #44**

* White chalky appearance (Incipient caries) :Demineralization starts at surface then continues to reach the subsurface and this leads to porosity in the subsurface but intact surface due to precipitation of phosphate, calcium and fluoride.
* Hidden caries:Can be detected by radiographs not clinically, in dentin .
* Incipient caries:White spot lesions can be detected clinically not by radiographs,in enamel.
* Intact surface can be seen in both,Incipient and hidden caries.
* Clinical examination: should be done by using, Air,mirror and light. Using air give you the ability to notice food remnants and even composite with perfect shade,also white spot lesions can be detected using air.
* Wet field can cause some difficulties to notice those white spot lesions, Why?
* Reflection with backscattering that means light enters and exists with different energy and direction.
* Refractive index of enamel appetites "minerals 95% " is 1.6 which approximately equals that of water , hence , when the pores are filled with water , the refractive index is almost the same, so we could miss it.

Using air dries the pores so difference of refractive indices becomes high.

* You can’t feel the white spot lesions, they’re visual not tactile, to reinforce Pts. Oral hygiene not more.

**Slides #45,46,47**

* Cavitation process of enamel is irreversible, associated with increasing rates of destruction of the carious tooth.
* With intact surface any lesion is treated by reinforcement of oral hygiene but once cavitation occurs we need operative treatment .
* Caries formation isn’t unidirectional, demineralization followed by remobilization occurs till a point when demineralization dominates.
* Crude and blunt are the most important criteria for the instrument you use to detect caries.
* Using explorer for caries detection could cause true cavitation in non cavitated incipient areas and it could produce a tactile sensation.
* Two factors should be considered in relation to active or arrested caries

1. Oral hygiene.
2. Age of the patient.

* If “ONLY” discoloration noticed don’t interfere operatively.

**Slide #48**

* It takes 18 months ± 6 months for an incipient lesion to progress to clinical caries we should tell that to the patient to reinforce his/her oral hygiene . It takes less than that in the case of pit and fissure caries due to its complicated anatomy.
* Peak rate for incidence of caries is 3 years after eruption of the tooth.
* Poor oral hygiene and frequent intake of cariogenic food, could develop an incipient white spot lesions in only 3 weeks ( kids with night milk feeding and poor oral hygiene habits).
* Patients undergoing radiation therapy for head and neck could develop caries in about 3 months due to” Xerostomia “ they have, this shows us the importance of saliva in modification of oral cavity. That’s why we should treat any problem before radiotherapy such as caries or extraction , because extraction after radiotherapy could develop osteomyelitis ( frequent condition ).

**Slide #49**

* Cavitation allows low adhesive bacteria to establish in the lesion.
* White lesions could be under contact points in the proximal surfaces , but we cannot notice this in radiograph unless if it was digital , but once there is a cavitation we will see a radiolucency in the X-ray.

**Slide #50**

* The histological process is more than what’s seen in the radiograph since X-rays record demineralization process ONLY with no consideration for the destruction of the organic part.
* In incipient caries, the intact surface of the enamel without its subsurface is stronger than the enamel’s surface for any normal tooth. “Because of the Remineralization process that leads to replacement of carbonate with fluoride”
* Arrested lesions ( remineralized ) could be observed clinically as intact, but discolored, usually brown or black spots.
* Notice that the color has nothing to do with the activity of the caries (Presence of bacteria or absence)
* Arrested caries should not be restored unless they are esthetically objectionable “As we mentioned before, remineralized arrested caries areas are intact and are more resistant to subsequent caries attack than the adjacent unaffected enamel”
* Active caries: Rough
* Arrested caries: Shiny and smooth

**Slide #51\*\*Important\*\***

* Zones of Incipient Enamel Lesion “Histological appearance: No cavitation”

1. Translucent zone.
2. Dark zone.
3. Body of the lesion.
4. Surface zone.

**Slides #52,53**

* Translucent zone :
* The deepest zone.
* Represents the advancing front of the enamel lesion.
* Structurless; due to its appearance when perfused with quinoline solution and examined with polarized light. “Quinoline: substance has the same refractive index of the enamel”
* Pores volume: 1-2 %
* Pores are 10 times greater than those in normal enamel.

**Slides #54,55,56,57**

* Dark zone :
* ↑ remineralization → ↑ the thickness of this zone
* Precipitation could lead to remineralization
* Pores volume 2-4%

**Slide #58**

* Body of the lesion:
* Worst zone (The largest portion of the incipient lesion while in a demineralizing phase)

**Slides #59,60,61**

* Surface zone:
* Hyper mineralization and increased fluoride content.
* The importance of the intact surface cannot be overemphasized, because it serves as a barrier to bacterial invasion.

**Slides #62,63**

* Once the caries reach the DEJ , we have to interfere operatively since the DEJ is less mineralized than the enamel and dentine , so the progression ( lateral spreading ) of caries is higher ( DEJ has the least resistance ).
* Higher progression in dentin than enamel,due to:

1. Structural differences: more water ,more organic portion than enamel , its hydroxy apatite's distribution is less and not systematically disturbed like the enamel , predentine is less mineralized than the intertubular dentine.
2. Lower resistance to acidic attacks.

* Enamel caries: Painless.
* Dentinal caries: short durations of pain “due to the hydrodynamic theory and odontoplastic processes, occurs when the dentinal tubules have been opened”

**Slides #64,65,66,67,68,69**

* Dentinal zones:
* Normal dentin :The deepest.
* Sub-transparent dentin.
* Transparent dentin: Intact collagen; Nucleus of crystal growth.
* Turbid dentin.
* Infected dentin : enamel and dentin lose their microstructures.

**Slide #70**

* Deep caries (Badly destructive teeth) we notice:
* Affected dentin: is softened, partially demineralized dentin , not yet invaded by bacteria. And the collagen fibers are intact , we don’t remove it.
* Infected dentin: is softened dentin that is contaminated with bacteria.
* Recall: Arrested caries found on the surface.

**Slides #71,72**

* Dentinal caries/Defense mechanism :

Chronic attrition for 10 years for example , the patient could feel nothing due to the tertiary dentine that protects the pulp , while in acute condition ( fracture ) the dentine becomes exposed so severe pain is felt.

\*Don’t forget to study the slides.