* 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
* Gingival recession
* Poor oral hygiene:Mostly seen in old Pts
* Anatomic surface contours: this leads to some difficulties in oral hygiene.
* 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)
* Root caries should be considered as an alarm for these reasons:

1. Rapid progression
2. 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,Glassionomer (GI) is our choice due to its ability to adhere chemically.

* 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

* 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.
* Two factors should be considered in relation to active or arrested caries

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

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

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

1. Translucent zone.(the deepest zone)
2. Dark zone.
3. Body of the lesion.
4. Surface zone.(hyper mineralization and increase fluoride content)

* Body of the lesion:
* Worst zone (The largest portion of the incipient lesion while in a demineralizing phase)
* Once the caries reach the DEJ , we have to interfere operatively since the DEJ is less mineralized than the enamel and dentine
* Higher progression in dentin than enamel,due to:

1. Structural differences: more water ,more organic portion than enamel .
2. Lower resistance to acidic attacks.

* Enamel caries: Painless.
* Dentinal caries: short durations of pain “due to the hydrodynamic theory
* 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

* 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