DEFENSE MECHANISM OF DENTINE AND PULP AGAINST INJURY
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• The reaction in dentine are mainly due to the activity of odontoblast, so that dentine and pulp should be consider as one tissue.

• A Varity of reaction are seen which are:

1. Dead tract.
2. Sclerotic dentine or transparent dentine.
3. Reparative dentine.
4. Infected dentine.
5. Affected dentine.
6. Inflammation of pulp.
1) **Dead tract**

- Are region of empty tubules in primary dentine that results from degeneration of odontoblastic processes found under most caries cavities.
- At the proximal end of tubules (near pulp), the dead tract has been sealed off by a layer of impermeable calcified tissue protected the pulp.

2) **Sclerotic dentine**

- Result from aging or mild irritation (such as slowly advance caries) and cause change in the composition in the primary dentine.
- The peritubular dentine become wider and filled the tubules with calcified material.
- Progressing from D.E.J.; pulpally these area are harder, denser, less sensitive and more protective of the pulp against subsequent irritation.
• Sclerosis results from aging is called “Physiological dentine sclerosis”

• Sclerosis results from mild irritation is called “Reactive dentine sclerosis”

• Reactive dentine sclerosis often can be seen radiographically in the form of more radiopaque (lighter) area in the S-shape of tubules.

• Clinically sclerosis is shiny and feels hard to explorer tip.

• Sclerosis dentine is commonly seen under old restoration and may be discolored, the causes of this sclerosis is the advance caries lesion that happen after cavity preparation refer from old restoration it self.
3) **Reparative dentine.**

- Caries advancing with fairlling high acid production, results in degeneration and death of odontoblast and their extension in the tubules, as well as mild inflammation of the pulp.

- The pulp is irritated sufficiently to cause the formation or replacement of odontoblast with form of reparative dentine (reactionary dentine) on the pulpal floor, the structure of reparative dentine is more often irregular, a tubular dentine depending on the severity of stimulation, reparative dentine is a defense reaction to an area of injury.
4) **Infected dentine**

- The infected dentine is softened and contaminated with bacteria, it’s includes superficial necrosis tissue or zone.
- **Clinically** necrotic dentine is wet mushy, easily removable mass.
- **Histologically** structureless or granular appearance and contain mass of bacteria.
- Remnant of dentinal tubules may be seen.
- The deeper infected dentine is dry and leathery, it’s easy removed by hand instrument and flake off in layers parallel to D.E.J.
- **Microscopic** examination reveals distorted dentinal tubules filled with bacteria.
- Cleft are seen in dentin perpendicular to tubules, these clefts represent the rest lines formed during the origin deposition of dentine and are more susceptible to caries attack.
• If the lesion progressing slowly they will be a zone of sclerosis dentine subjacent to the
demineralize dentine, when this occur it represent the ideal excavation depth, since the
sclerosis barrier blocks the penetration toxin and acid.

5) Affected dentine

• Soft dentine not yet invaded by bacteria and has intact tubules containing odontoblastic
process that have porous surface and contain crystalline material.

• This dentine capable of remineralization, provided the pulp remain vital.

• In slowly advancing caries lesion we should remove all softened dentine down to the zone of
sclerosis dentine.

• In rapidly advancing caries lesion there is little clinical evidence by texture or color change
to indicate the limit of infected dentine.
THANK YOU