

Operative Dentistry

Lecture

Treatment of deep
seated caries

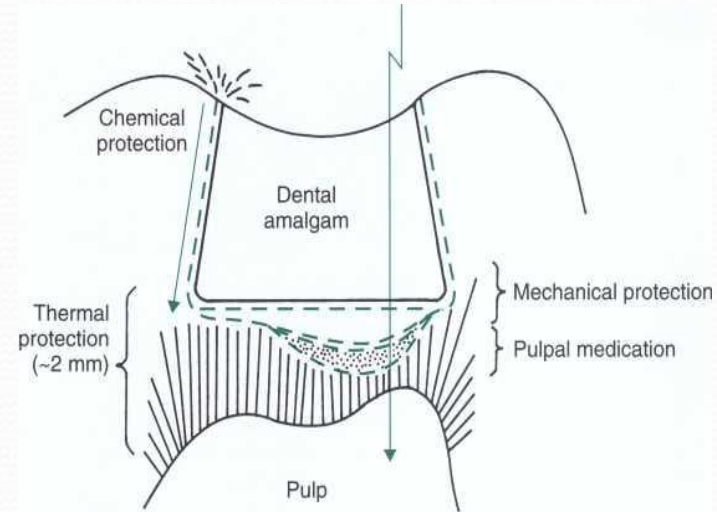


Pulpal protection

- For teeth with a normal pulp or reversible pulpitis a protective liner (sub-lining or sub-base) or lining (base) is used (such as calcium hydroxide or glass ionomer cement).
- liner or base is a material that can be placed on the pulpal surface of a cavity. It must cover the exposed dentinal tubules and act as protective barriers between dentine (and sometimes pulp) and the restorative material.

Pulpal protection

- *Pulpal protection* requires consideration of
 - *chemical protection.*
 - *Electrical protection.*
 - *thermal protection.*
 - *pulpal medication,*
 - *mechanical protection*

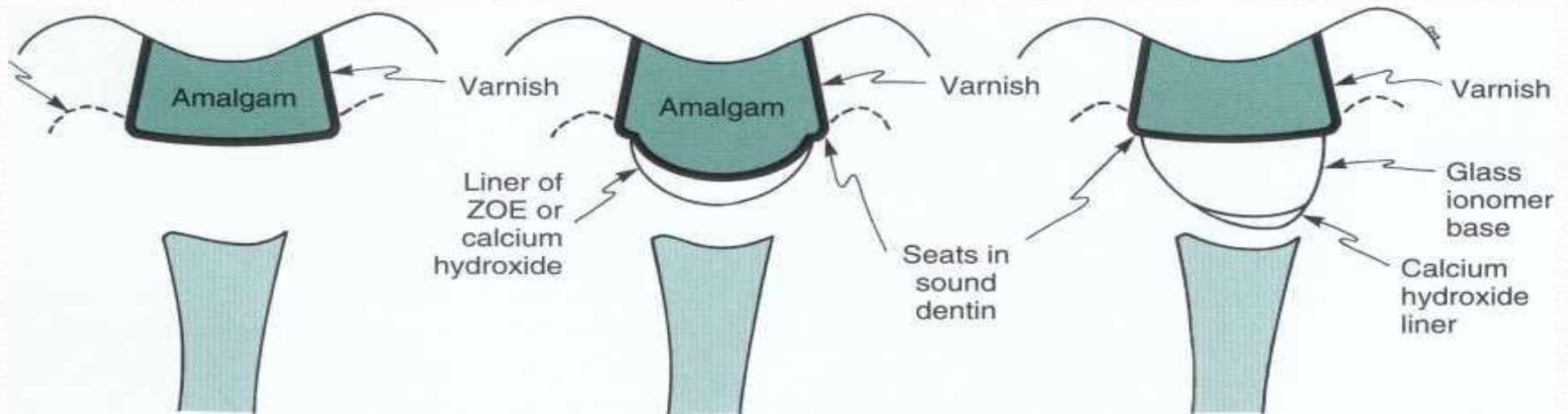


Varnishes, liners, and/or bases may be added under amalgam.

Pulpal protection

- The characteristics of the liner or base selected are largely determined by the purpose it is expected to serve. Because they share similar objectives. Their objectives are:
 - minimizes pulp tissue injury, preserves the tooth vitality and promotes pulp tissue healing.
 - minimizes microleakage.
 - minimizes postoperative sensitivity.

Pulpal protection



A, For shallow amalgam tooth preparations, varnish or sealer is applied to walls of preparation before insertion of restoration.

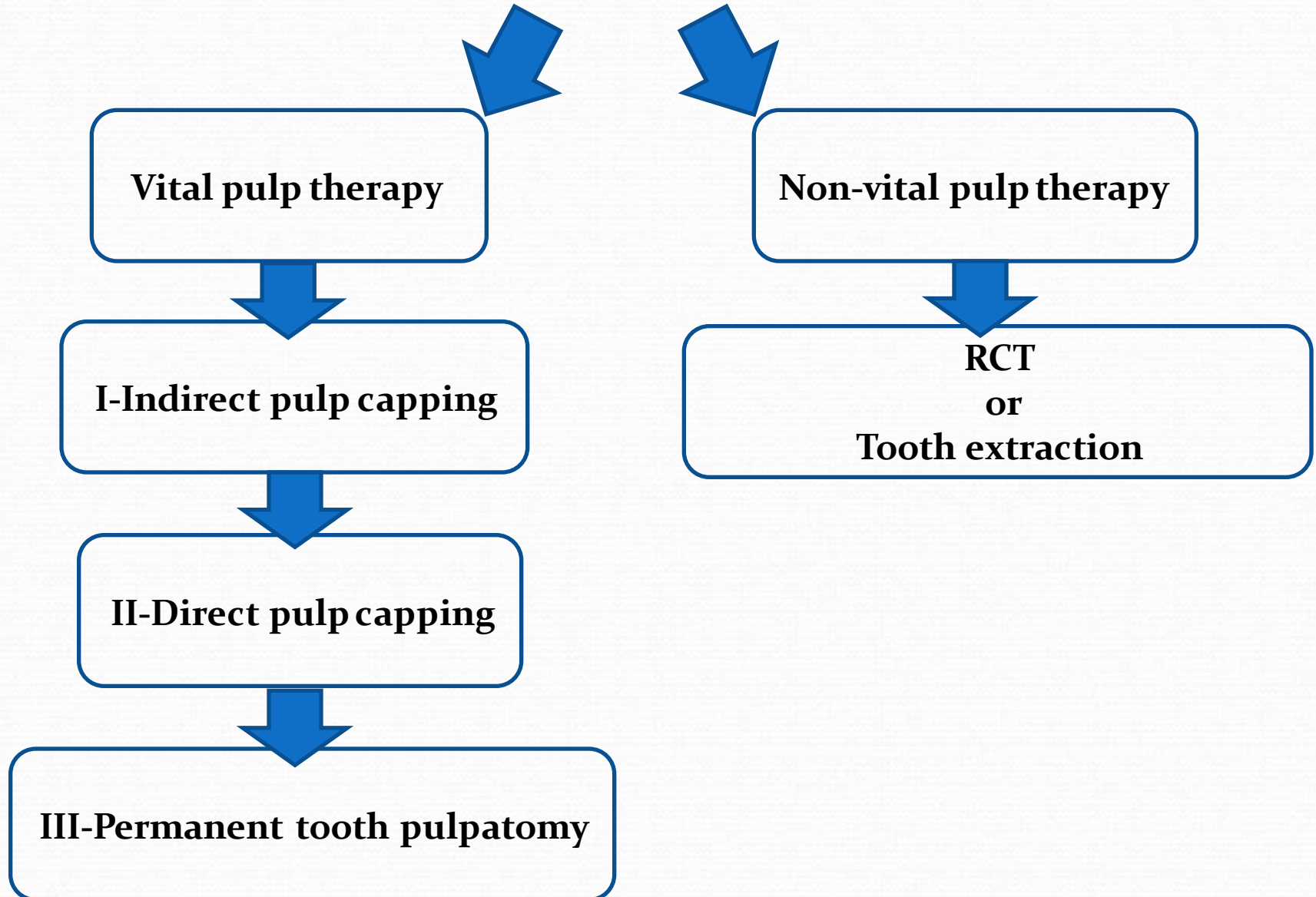
B, For moderate depth tooth preparations, liners may be placed for thermal protection and pulpal medication. (Note seats in sound dentin for amalgam restoration.).

C, In very deep preparation, light-cured calcium hydroxide is placed in deepest region in which infected dentin was excavated, and then base of glass ionomer is inserted. Amalgam bonding systems are being advocated as a substitute for liner and varnish, except for calcium hydroxide liner in the deepest region (judged to be within 0.5 mm of pulp).

Treatment of deep carious lesions

- In a shallow or moderately deep cavity, all carious dentine should be removed leaving a glossy hard dentin surfaces.
- While, in treatment of deep carious lesions, the dentist has several options to do.

Treatment of deep carious lesions



I-Indirect pulp capping

- It is two or more appointments, preferred by many clinicians, more conservative and yields more favorable results than direct pulp capping.
- Indication:
 - Deep carious lesion.
 - No history of subjective pretreatment symptoms or history of spontaneous pain.
 - Positive vitality test.

II-Direct pulp capping

- One or two appointments, carious dentine is completely removed, and the pulp bleeds when touched.
- Indication:
 - Small mechanical exposure of a clinically vital and asymptomatic pulp occurs.
 - Adequate hemostasis is achieved.
 - Restorable tooth.

III-Permanent tooth pulpatomy

- Is a conservative procedure to remove inflamed coronal pulp tissue and preserve the vitality of the remaining radicular pulp.
- Indication:
 - Tooth with large carious lesion or mechanical/traumatic pulp exposure and it is restorable.
 - No abscess, fistula, swelling, mobility, absent or profuse hemorrhage, radiolucency exists in the furcal or periradicular areas, spontaneous pain especially at night and pulp is not necrotic.

III-Permanent tooth pulpotomy

- Is a conservative procedure to remove inflamed coronal pulp tissue and preserve the vitality of the remaining radicular pulp.
- Indication:
 - In primary teeth with insufficient root structure, internal resorption, furcal perforation or periradicular pathosis that may jeopardize the permanent successor are not indicated for pulpotomy procedures.
 - In permanent teeth with immature root formation, as an interim procedure to allow continued root development (apexogenesis).
 - In permanent teeth, as an emergency procedure until root canal treatment can be accomplished.

I-Indirect pulp capping

- Procedure: Treatment consists of two visits approximately six-to-eight months apart.
 - Rubber dam isolation.
 - All peripheral carious dentin is removed with large round bur or sharp spoon excavator.
 - Only soft carious dentin is removed in the area close to the pulp, caries biomass (infected dentin) is excavated leaving affected dentin adjacent to the pulp
 - CaOH₂, cement base (such as zinc oxide) and permanent filling, or CaOH₂ and temporary filling is placed.

I-Indirect pulp capping

- Procedure:
 - After 3-6 weeks.
 - The cement is removed.
 - Internal surface of the cavity is inspected for remineralization and reparative dentin formation.
 - Remove any residual soft dentin.
 - Place CaOH_2 , cement base (lining material) and permanent filling, such as amalgam restoration.

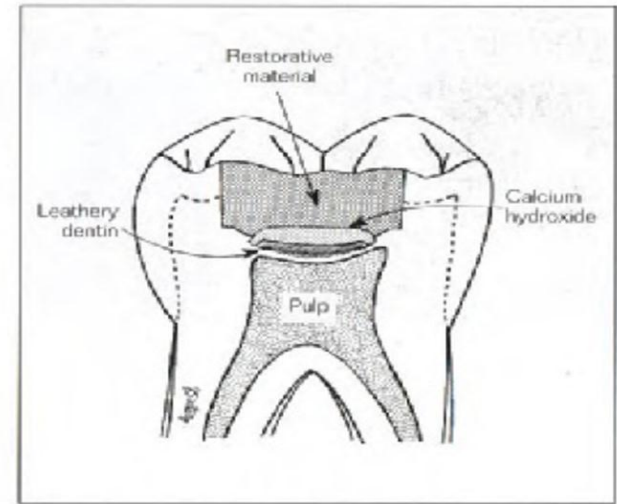
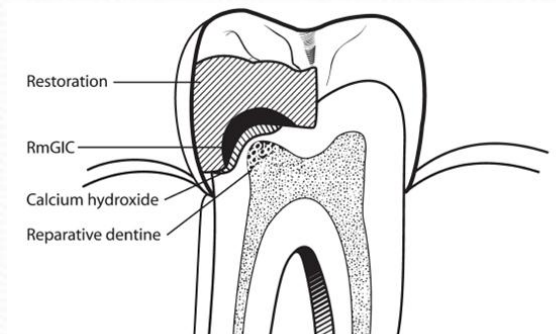


Fig 5-4 In an indirect pulp capping procedure, all carious, demineralized dentin is removed in the periphery of the preparation, but a small amount of demineralized dentin is left immediately over the area of the pulp. A calcium hydroxide lining material is placed to cover the remaining demineralized dentin. A sealing liner and/or a sealing restoration is then placed to seal out bacteria and their by-products.

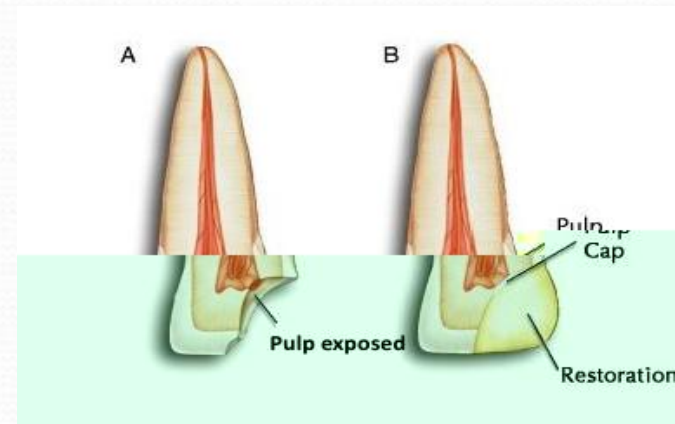


II-Direct pulp capping

- Procedure:
 - Rubber dam isolation.
 - Soft carious dentin is carefully removed.
 - Extreme care not to force carious dentin into pulp chamber, burs and air must not be used.
 - Sterile water or normal saline must be used for cleaning.
 - If the bleeding at the exposure site is arrested and the area is dry, then we place CaOH_2 covering all exposure site and 1-2 mm of the surrounding area.
 - Then place cement (zinc oxide or glass ionomer or any other cement) and permanent filling, such as amalgam restoration.

II-Direct pulp capping

- Procedure:
 - The status of the pulp and periradicular tissues should be assessed through periodic recall examinations.

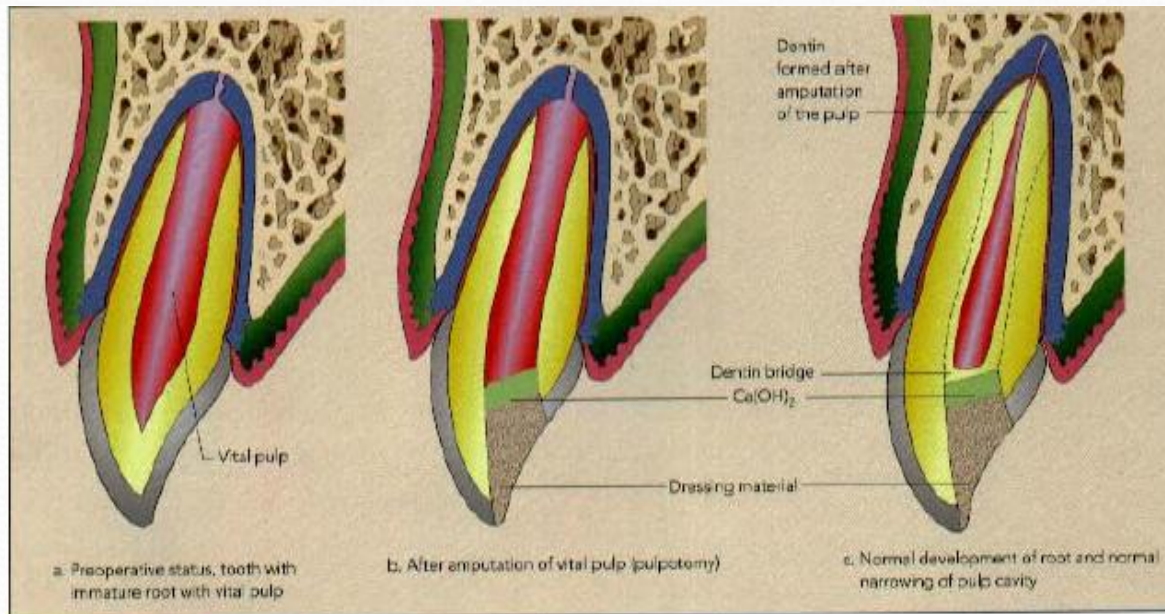


III-Permanent tooth pulpatomy

- Procedure:
 - Rubber dam isolation.
 - Excavate all caries and establish a cavity outline.
 - Remove the roof of the pulp chamber.
 - Amputate the coronal pulp with a large low-speed round bur or sharp spoon excavator.
 - Stop the bleeding with a cotton pellet applied with pressure.
 - Cover the pulp with CaOH₂ and complete the restoration (place quick-setting ZOE cement or resin-reinforced glass ionomer cement over the calcium hydroxide to seal and fill the chamber).

III-Permanent tooth pulpotomy

- Procedure:
 - After the complete root formation (apexogenesis) the tooth should be reopened and removes any restorative material from the pulp chamber and root canal therapy is done.



Capping agents

- Calcium hydroxide cements.
- MTA (Mineral Trioxide Aggregate)
- Bioactive dentin replacement and it is also called as smart dentin replacement and popularly known as Biodentine.

Treatment of deep carious lesions

- Once the exposed pulp is capped with CaOH₂, the healing process in the pulp begins. CaOH₂ has high pH value ranging from (10-12) and its effect is of short duration.
- The repair process begins in the pulp at the 3rd day after capping by proliferation of fibroblast towards the site of injury from the deeper pulp tissue.



Thank you