

Clinical applications

DMD2

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Liners

- Liners are materials that are placed as a thin coating (usually 0.5 mm) on the **pulpal surface** of a cavity preparation.
- Although they provide a barrier to chemical irritants, they are not used for thermal insulation or to add bulk to a cavity preparation.
- Furthermore, these materials do not have sufficient hardness or strength to be used alone in a deep cavity

Classification

Thin liners:

- Solution liners (varnish)
- Suspension liner
- Bonding agent

Thick liners (cement liners):

- Hard setting calcium hydroxide cement
- Light cured calcium hydroxide
- Low viscosity type IV zinc oxide eugenol cement
- Resin modified glass ionomer cement

Calcium Hydroxide

Properties

- Low thermal conductivity
- Stimulates the production of irregular secondary (tertiary) dentine
- pH of 11–12 (i.e. alkaline)
- Bactericidal properties

Advantages

- Easily manipulated
- Stimulates the formation of irregular secondary (tertiary) dentine

Disadvantages

- Moisture sensitive
- Low strength

Indications

- For use with direct or indirect pulp capping
- Only used when within 1–2 mm of pulp or direct pulp capping
- May be used underneath a base



GIC and RMGIC lining cements (resin modified GIC)

GIC and RMGIC

Advantages

- can bond to the dentine
- releases fluoride
- is radio-opaque

RMGIC

- it has greater cohesive strength than conventional GIC
- it is light cured => control setting time
- Not suitable for direct pulp capping

- **Vitrebond** - Resin modified GIC
- For tooth-coloured restorations, you need to use dentine conditioner prior to placing the GIC and RMGIC
- The resin present in the liner can bond to the composite restoration above it as well as the dentine underneath it



Ledermix cement

- Used to calm down an inflamed pulp causing pain

Two versions - Do not get confused

- LEDERMIX PASTE: used in endodontics and never sets!
- **LEDERMIX CEMENT: used as a liner in restorative and does set!**



Odontocem

- **calcium silicate-based cement**
- provides a biocompatible layer advantageous for successful direct pulp capping
- Contains 0.2% triamcinolone acetonide, a potent steroid, to provide transient relief of pain
- Low dose of the steroid → Inflammatory response required for the formation of the dentinal bridge is only temporarily delayed.



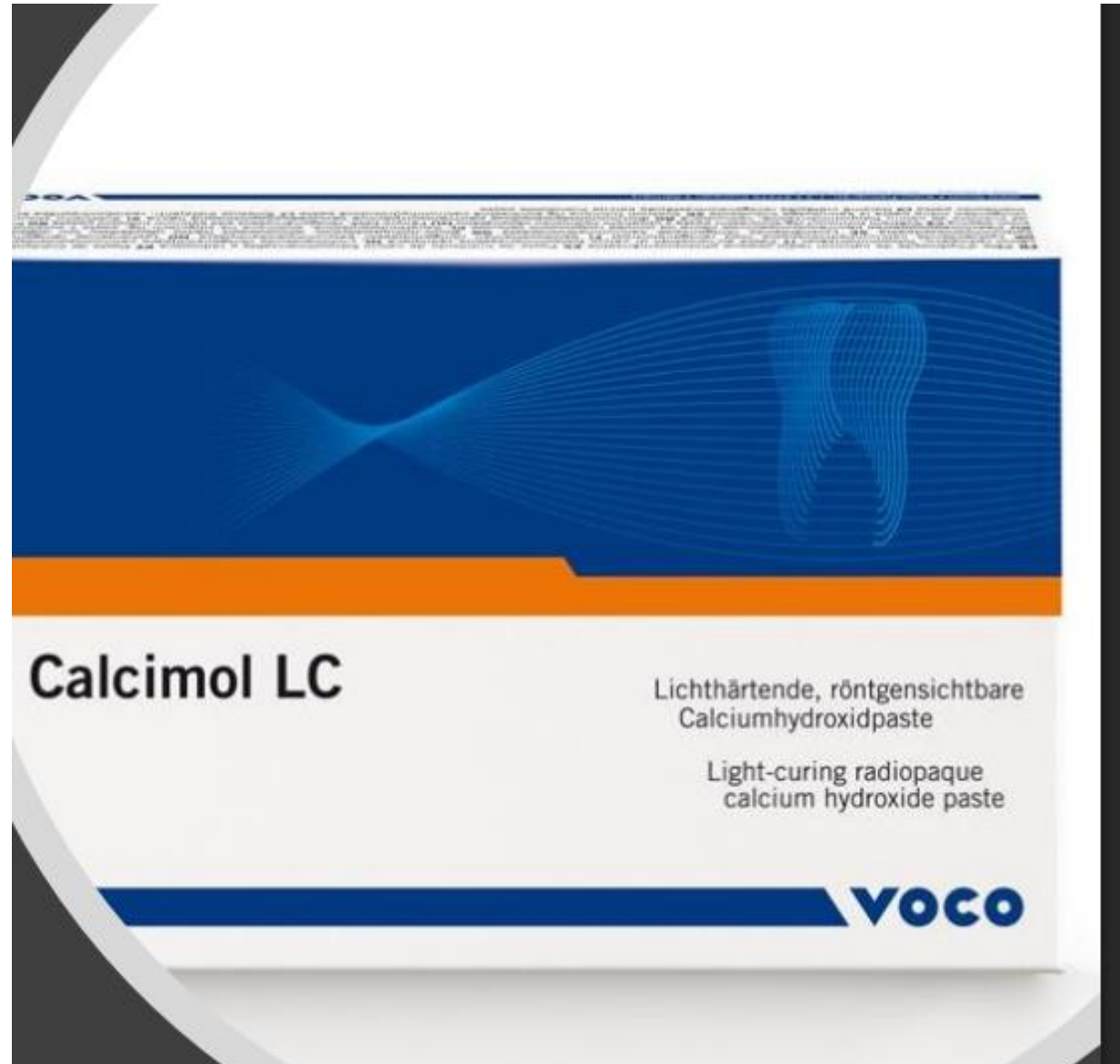
Suspension liners

- Calcium hydroxide and zinc oxide in resinous solution, but greater film thickness than varnish
- Film thickness still not sufficient for thermal or electric insulation



Calcimol LC

- Light cured Calcium hydroxide: Urethane dimethacrylate (UDMA) + Calcium hydroxide + low viscosity monomer



Clinical application



FIG. 13.43 A, Cavity preparation of tooth 30 before placing cavity liner. B, Preparation after placement of cavity liner.

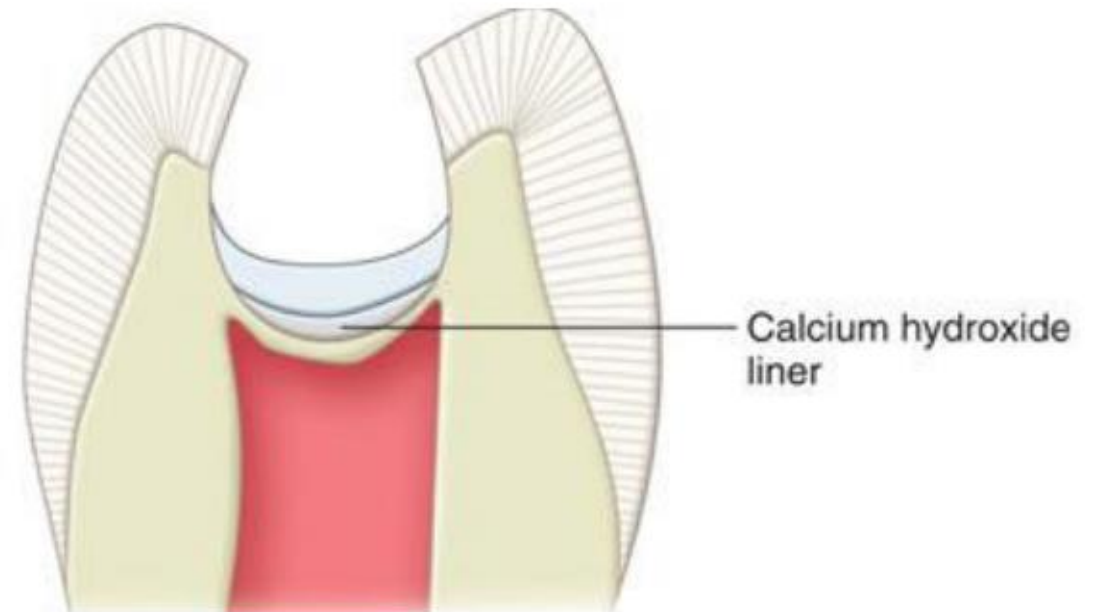
Application

- The liner material should be added only to one aspect of the ball end of the applicator
- When the liner material is applied to the pulpal floor, keep it off the walls and out of any macro-mechanical retention

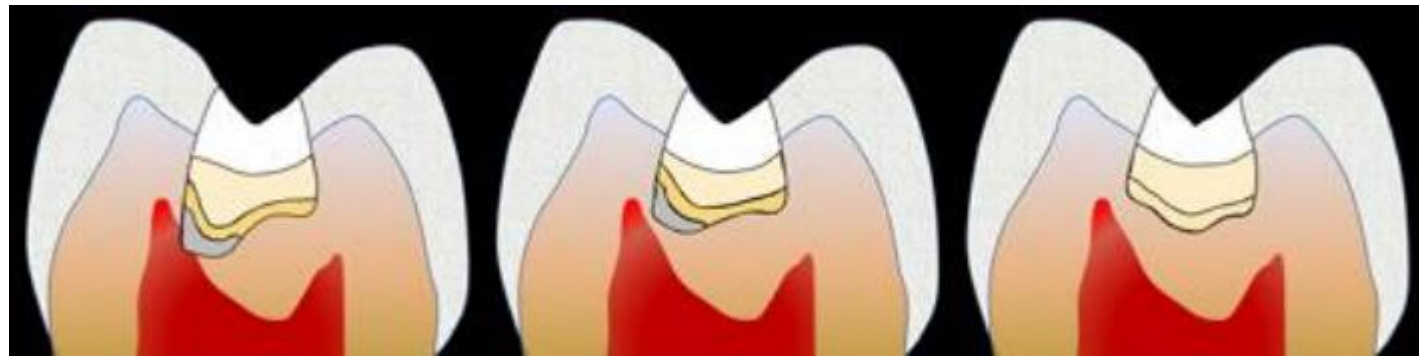


Vitrebond or Dycal or both?

- Dycal has low compressive strength and is soluble, so it benefits from being covered with a stronger, more durable material like Vitrebond.
- Vitrebond provides a better seal, helping to bond the restoration to the tooth structure, and releases fluoride, which can further protect the tooth.
- Liners approx. 0.5mm thickness



Clinical application



- Applying a Dental Liner Preparation: Ensure the cavity is clean and dry.
- Selection: Choose an appropriate liner material, such as calcium hydroxide or glass ionomer.
- Application: Use a Dycal Applicator.
- Calcium Hydroxide: Apply a thin layer over the exposed dentine/pulp (if pulp capping) using a small applicator.
- This material helps in dentinal sealing, pulpal protection, and stimulates the formation of secondary dentine.
- Glass Ionomer: Apply a thin layer to provide additional benefits like fluoride release and chemical bonding to the dentine.
- Curing: light cure if required

Bases

Applying a Dental Base

- Selection: Choose a base material, such as zinc oxide eugenol, glass ionomer, or resin-modified glass ionomer.
- More commonly used under amalgam restorations.
- 1-2mm thickness – to replace lost dentine; thermal protection for pulp

Application:

Zinc Oxide Eugenol: Mix the material and apply a relatively thick layer on the floor of the cavity preparation.

This material provides thermal insulation and absorbs occlusal forces.

Glass Ionomer: Apply a thicker layer to protect the pulp and provide thermal insulation.

Curing: light cure if required.

Inspection: Ensure the liner and base are properly set and cover the intended areas.

