

Cavity Liner and Cement Base part2

Cavity liners:

1- Cavity varnishes: -

Functions: -

- 1- It is placed on enamel and dentin walls to reduce the penetration of oral fluids around amalgam restoration. The cavity varnish inhibited microleakage during the first few weeks. After that the varnish will dissolved by oral fluids and replaced by the corrosion products of the amalgam which form at the amalgam tooth interface.
- 2- Varnish is applied on dentin surfaces to minimize penetration of the acid from zinc phosphate cement by occluding the orifices of the dentinal tubules.
- 3- Reduce post operative sensitivity.

Properties:

- 1- When glass ionomer cement is used as a base material, varnish should not be used as subbase, because glass ionomer cement contains fluoride, and varnish prevents fluoride release and reaction with the tooth, also varnish prevents the chemical bonds between tooth and glass ionomer cement.
- 2- Varnish should not be used when the restoration is composite resin. Because varnish inhibits polymerization reaction of composite resin material. So, calcium hydroxide can be used under composite resin.

2- Bonding agent:

These bonding agents act as liner for the composite restorations especially for shallow cavities, because they occlude the orifices of dentinal tubules and reduce post operative sensitivities.

3- Calcium hydroxide:

Properties:

- 1- The antimicrobial action of calcium hydroxide makes this material useful in **indirect pulp capping** procedures.
- 2- Calcium hydroxide stimulate the odontoblast cells for the formation of secondary dentin (stimulate the formation of dentinal bridge) when it is put directly over exposed pulp tissue, so calcium hydroxide is used for **direct pulp capping**.

General Clinical Consideration: -

After cavity preparation, certain factors should be taken in consideration during lining placement in the cavity:

- 1- The prepared cavity should be clean and dry before application of lining material. The quadrant of the prepared tooth should be isolated completely from saliva, because the entire lining and base material are sensitive to water during their application and setting.
- 2- All liners and base materials undergo dissolution and disintegration in saliva with time; therefore, they should not reach to the margins of the cavity (except varnishes and bonding agent). So lining is placed on: pulpal floor in Cl I, pulpal floor and axial wall in Cl II, axial wall in Cl III, IV, and V.
- 3- In cavities prepared for amalgam restorations, the base material should not be extended on the walls of the cavity because this material will block the undercuts (convergence of the buccal and lingual walls) which are important for the amalgam retention. Also, all the retentive holes, grooves, and pins should be free from lining before amalgam placement.

Cavities can be classified according to their proximity from the pulp into:

- 1- **Shallow cavity preparation:** - there is no need for pulpal protection, there is a sufficient thickness of dentin so that no protective base required. For dental amalgam the cavity is coated with two thin coats of a varnish and restored. For a composite the cavity is etched, coated with a single coat of a bonding agent and restored. Both varnish and the bonding system provide chemical protection.

2- Moderately deep cavity: - a prepared cavity that extends into dentin beyond the minimal depth necessary to attain retention and strength for the restorative material.

Varnish is used to coat the floor and walls, then a cement base such as zinc phosphate cement, or modified ZOE cement may be contoured to replace the missing dentine.

3- Deep cavity: - that includes some extension toward the pulp, a liner such as Ca (OH)₂ should be applied on the pulpal and axial walls. On top a cement base is placed

such as zinc phosphate cement, or modified zinc oxide eugenol cement or poly carboxylate cement then a varnish is used to coat the walls. Recently, new protocol prefers the use of dycal with glass ionomer base, because of the present of chemical bonding between the tooth and the glass ionomer cement that will reduce microleakage and the sensitivity postoperatively. (as in fig 1 bellow)

4- Deep cavity with exposure of the pulp: - exposure of a small area of the pulp with no sign or symptoms of degenerating pulp, the choice of conservation pulp capping is recommended. In an isolated clean field, calcium hydroxide is carefully placed over the pulp and the border of dentin which surround the exposure site. A base material is placed on top (such as zinc phosphate or reinforced zinc oxide eugenol), and also glass ionomer cement base is preferred. The restoration of the tooth should be completed as soon as possible. Secondary dentin barrier is likely to be formed within a few weeks. (as in fig 2 bellow)

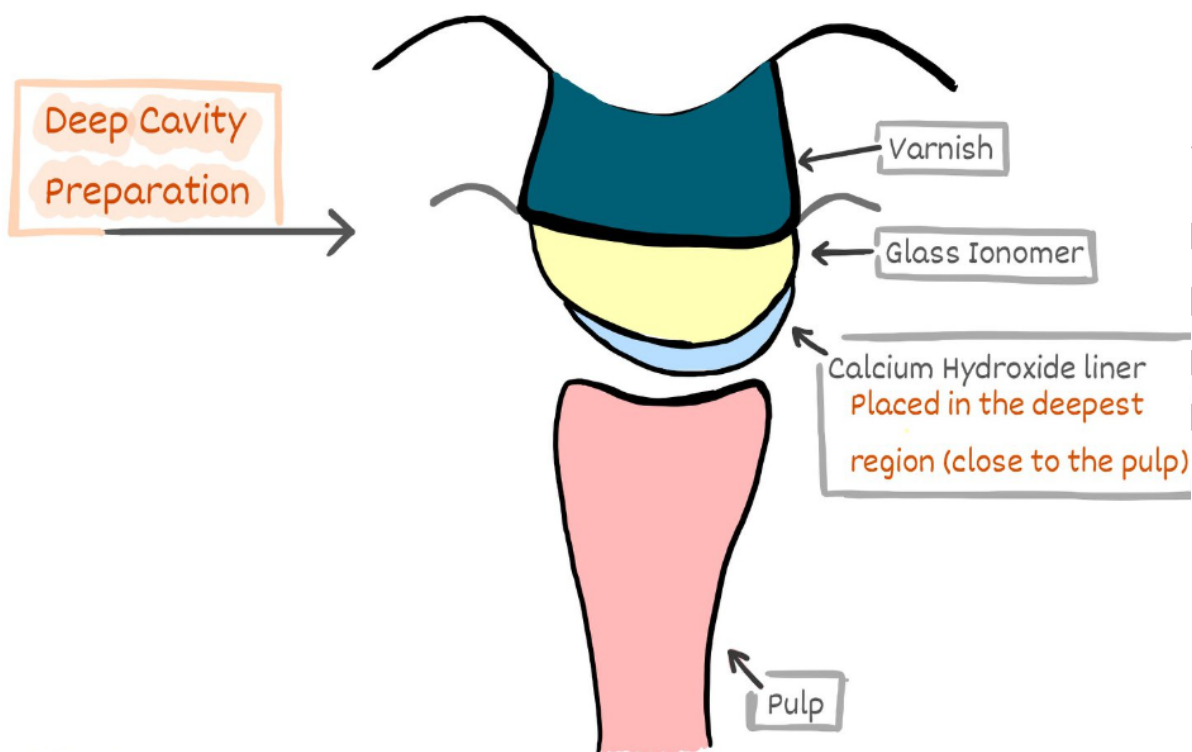


fig 1

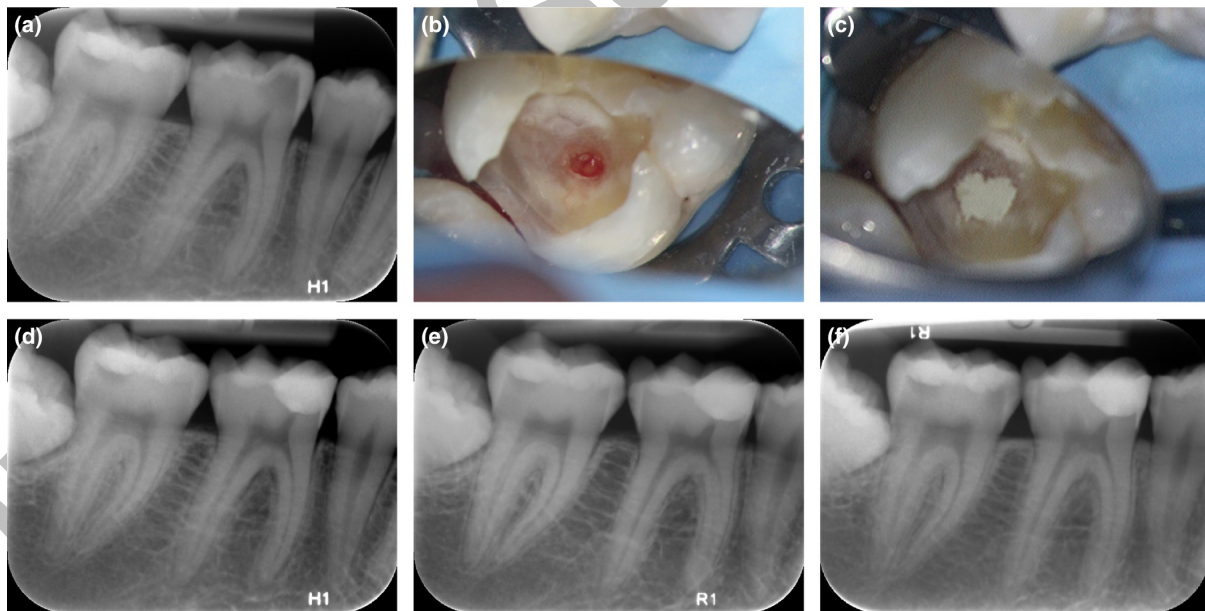


fig 2