

**MUHAMMAD YASEEN**

**STUDENT ID 14796**

**PAPER DENTAL MATERIAL**

**TEACHER MR.USMAN**

**QUESTION.1:**

ANS: **USES OF CALCIUM HYDROXIDE CEMENTS**

Calcium hydroxide cements perform the following function

### **Pulp capping Agent:**

- Calcium hydroxide is generally accepted as the material of choice for pulp capping. Histologically there is a complete dentinal bridging with healthy radicular pulp under calcium hydroxide dressings. When calcium hydroxide is applied directly to pulp tissue there is necrosis of adjacent pulp tissue and an inflammation of contiguous tissue.

### **Endodontic sealer:**

- To be therapeutically effective calcium hydroxide must be dissociated into  $\text{Ca}^{++}$  and  $\text{OH}^-$ . Therefore to be effective, an endodontic sealer based on calcium hydroxide must dissolve and the solid consequently lose content.

### **Apexification:**

- In apexification technique canal is cleaned and disinfected, when tooth is free of signs and symptoms of infection, the canal is dried and filled with stiff mix of calcium hydroxide and MTA. Histologically there is formation of osteodentin after placement of calcium hydroxide paste. There appears to be a differentiation of adjacent connective tissue cells; there is also deposition of calcified tissue adjacent to the filling material.

### **Pulpotomy:**

- It is the most recommended pulpotomy medicament for pulpally involved vital young permanent tooth with incomplete apices. A pulpotomy is the

removal of a portion of the pulp, including the diseased aspect, with the intent of maintaining the vitality of the remaining pulpal tissue by means of a therapeutic dressing.

- **Weeping canals:**

- For such teeth dry the canals with sterile absorbent paper points and place calcium hydroxide in canal. Calcium hydroxide converts the acidic pH of periapical tissue in the weeping canal to basic pH.

**Question.2:**

**ANS: PORPERTIES OF MTA:**

PH

Initial pH of 10.2 which rises to 12.5 (similar to calcium hydroxide) following setting. The high pH is theorized to be responsible for the antimicrobial action and biological activity of the material

**Working time** 5minutes

**Setting time** 3-4hours (old one) 20minutes

**Solubility** MTA displays low or nearly no solubility, which is attributable to addition of the bismuth oxide.

- **Compressive strength**
- The compressive strength of set MTA is about 70 mpa
- **Biocompatible**
- **good Sealing Ability (resist Micro leakage)**

- Usually a thickness of 3 mm to 5 mm is sufficient to provide a good seal.

### **MANIPULATION AND SITTING REACTION OF MTA**

The MTA paste is obtained by mixing 3 parts of powder with 1 part of water to obtain putty like consistency (distilled water, local anesthesia, Normal saline). Mixing can be done on paper or on a glass slab using a plastic or metal spatula. This mix is then placed in the desired location and condensed lightly with a moistened cotton pellet.

MTA has a pH of 10.2 immediately after mixing and increase to 12.5

After 3 hours of sitting which is almost similar to calcium hydroxide.

MTA powder should be stored carefully in closed sealed containers away from moisture. The mixing time of MTA is crucial. If the mixing of MTA is prolonged, it results in dehydration of the mix.

MTA take longer time to set compared to any other material. The exact time taken to set varies between different studies.

MTA being hydrophilic requires moisture to set, making absolute dryness contraindicated. Presence of moisture during setting improves the flexural strength of the set cement.

### **Question.3:**

ANS: **MANIPULATION OF AMALGAM:**

### **Trituration:**

- Trituration is the process by which mercury is allowed to react with the alloy powder. This procedure allows the rubbing of the

surface oxide on amalgam particles, exposing an active surface to react with mercury.

- **Trituration:** 1) hand trituration  
2) Mechanical trituration

### **Hand Mixing**

A glass mortar and pestle is used. The mortar has its inner surface roughened to increase the friction between amalgam and glass surface with carborundum paste. A pestle is a glass rod with a round end.

### **Mechanical Mixing**

- The disposable capsule serves as a mortar. Some capsules have a cylindrical metal or plastic piece in the capsule which serves as the pestle.
- Reusable capsules are available with friction fit or screw.
- Amalgamators have automatic timer and speed control device. The speed ranges from 3200 to 4400 cycles per minute. High copper alloys require higher mixing speed.

### **Indications:**

- Restoration of posterior teeth (Class I & II) (Moderate to large preparations)
- In some cases restoration distal surface of the canine
- Class V preparations (some cases)
- Class VI preparation
- Core build up for badly broken down teeth in the posterior teeth

### **Contraindication:**

When esthetics is important (e.g. anterior teeth)

- Patients have a history of allergy to mercury or other amalgam components
- Remaining tooth structure requires support.
- Treatment of incipient or early, primary fissure caries.

#### **QUESTION.4:**

ANS: **COMPOSITION OF CALCIUM HYDROXIDE:**

#### **Accelerator Paste**

- Alkyl salicylate 36 – 42 %
- Inert fillers – titanium oxide 12 – 14 %
- Barium sulphate 32 – 35 %
- Calcium sulphate 14 – 15 %

#### **Base paste**

- Calcium hydroxide 50-60%
- Zinc oxide 10%
- Zinc stearate 0.5%
- Ethylene toluene sulphonamides and paraffin oil 39.5%

#### **Advantages:**

- Initially bactericidal then bacteriostatic.
- Promotes healing and repair.
- High pH stimulates fibroblasts
- Neutralizes low pH of acids.
- Stops internal resorption.

- Inexpensive and easy to use

### **Disadvantages:**

- Does not exclusively stimulate dentinogenesis.
- Does exclusively stimulate reparative dentin.
- Associated with primary tooth resorption.
- May degrade during acid etching.
- Degrades upon tooth flexure.
- Marginal failure with amalgam condensation.

Does not adhere to dentin or resin restoration

### **Question.5:**

### **ANS: COMPONENTS OF COMPOSITE RESIN:**

Following are some of the important components.

- Matrix
- Filler
- Coupling Agent
- Initiators and accelerators
- pigments

### **Resin Matrix:**

- Bis-GMA (bisphenol-A glyceril methacrylate)
- UDMA (urethane dimethacrylate)
- TEGDMA (triethylene glycol dimethacrylate)

Use of Composition resins:

Flowable

Condensable

### **1) Flowable Composites:**

Has a reduced filler content to make the material “flowable”

Indicated for Class I restorations in the gingival areas

Used as a cavity base or liner especially for Class II preparations wherein access is difficult to achieve

Used as a pit and fissure sealant

### **Condensable Composites:**

- Has a filler particle that inhibits the filler particles by sliding to one another
- Stiffer, thicker feel

**The End**

