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PAPER DENTAL MATERIAL

PROGRAMME BS DT

**Q#1 EXPLAIN USES OF CALCIUM HYDROXIDE CEMENT?**

**Ans: calcium hydroxide cement perform the following function**

 **ENDODONTIC SEALER**

**To be therapeutically effective calcium hydroxide must be dissociated into ca++and OH.there for to be effective , an endodontic sealer based on calcium hydroxide must be dissolve and the solid consequently lose content.**

 **PULPOTOMY**

**It is most recommended pulptomy medicament for pulpally involved vital young permanent tooth with incomplete apices.A pulpotomy is the removal of a portion of the pulp. Including diseased aspect ,with the intent of maintaining the vitality of remaining pulpal tissue by means of a therapeutic dressing.**

 **APEXIFICATION**

**In apexification techjnique canal as cleaned and disinfected,when tooth is free of sign and symptom of infection, the canal is dried and filled with stiff mix of calcium hydroxide and MTA Histological there is formation of osteodentin after placement of calcium hydroxide paste.There appears to be differentiate of adjacent connective tissue cell there is also deposition of calcified tissue adjacent to the filling material.**

 **WEEPING CANAL**

**For such teeth dry the canal with sterile absorbent paper point and place calcium hydroxide in calcium, calcium hydroxide convert into acidic PH of peripical tissue in the weeping canal to basic PH.**

 **PULP CAPPING AGENTS**

**Calcium hydroxide is generally accepted as the material of choice for pulp capping. Histologically there is complete dentinal bridging with healthy radicular pulp under calcium hydroxide dressing.**

**Q#2 WRITE A DETAIL NOTE ON PROPERIES OF MINERAL TRIOXIDE AGGREGATE AND ALSO EXPLAIN MANIPULATION AND SETTING REACTION OF MTA?**

**ANS: INTRODUCTION**

**• Quest for newer material are never ending especially in the field of dental science. Various material have been formulated, tested and standard to obtain**

**maximum benefit for good clinical performance**

 **• One such new material is Mineral Trioxide Aggregate (MTA), which was introduced by Dr.Mahmoud Torabinejad at Loma Linda University, California, US and**

**the first literature about the material appeared in 1993**

 **PROPERTIES 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.**

**• Retentive strength : MTA is not suitable as luting agent**

**• Marginal adaptation is better than intermediate Restorative Material (IRM)**

**• Ethoxy Benzoic Acid (super EBA)**

**• amalgam and GIC**

 MANIPULATION AND SETTING 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 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 increases to 12.5 after 3 hours of setting which is almost similar to calcium hydroxide.

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

Sluyk et al in 1998 reported that the mixing time should be less than 4 minutes.

MTA takes longer time to set compared to any other material. Exact time taken to set varies between different studies.

According to torabinejad and colleagues in 1995 the setting time of grey MTA is about 2 hours and 45minutes (+5 minutes) whereas Islam et al in 2006 reported 2 hours and 55 minutes for grey MTA and 2 hour and 20 minutes for white MTA.

Extended setting period of MTA is one of its main drawbacks. It is suggested by many investigators that the incorporation of accelerators such as sodium phosphate dibasic and calcium chloride may reduce the setting time.

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

**Q#3 DISCUS MANIPULATION OF AMALGAM, WRITE INDICATION AND CONTRAINDICATION OF AMALGAM?**

**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 road 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.**

**• Mechanical amalgamator for proportioned capsules (left) Close-up the mechanical arm that grips and vibrates the capsules.**

**• The amalgam is placed in the cavity after trituration, and condensed using suitable instrument.**

**• Proper condensation increase the strength and decrease the creep of the amalgam. Condensation must always be done within the four walls and floor.**

**• If one or more walls of the cavity are missing, a steel matrix may be used to compensate for it.**

 **MANUAL CONDENSATION**

**• The mixed material is condensed in increments. Each increment is carried to the prepared cavity by means of a small forceps or an amalgam carrier.**

**• Once inserted, it should be condensed immediately with sufficient pressure (approximately 3 to 4 pounds).**

**MECHANICAL CNDENSATION**

**• Mechanical condensers provide vibration or impact type of force to pack the amalgam mix. Less effort is needed than for hand condensation.**

 **CARVING**

**• The amalgam is overfilled into the cavity and the mercury rich surface layer is trimmed away.**

**• The filling is carved to reproduce the tooth anatomy. The carving should not be started until the amalgam is hard enough to offer resistance to the**

**Carving instrument.**

**• A scraping or ringing sound should be heard when it is carved.**

**• If the carving is started too soon, the amalgam may be so plastic that it may pull away from the margins.**

 **BURNISHING**

**• After the carving, the restoration is smoothened, by burnishing the surface and margins of the restoration.**

**• Burnishing slow setting alloys can damage the margins of the restoration.**

**• Burnishing is done with ball burnisher using light stroke proceeding from the amalgam surface to the tooth surface. Final smoothing can be done by rubbing**

**the surface with a moist cotton pellet.**

 **POLISHING**

**• Polishing minimizes corroision and prevents adherence of plaque. The polishing should be delayed for atleast 24 hours after condensation**

 **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.**

**Q#4 DISCUS COMPOSITION OF CALCIUM HYDROXIDE WITH ADVANTAGE AND DISADVANTAGE?**

**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%**

 **ADVANTAGE**

**• 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**

 **DISADVANTAGE**

**• Does not exclusively stimulate dentinogenesis.**

**• Does exclusively stimulate reparativedentin.**

**• 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.**

**Q#5 WRITE COMPONENT OF COMPOSITE RESIN AND ALSO DISCUS USES OF COMPOSITE RESIN?**

**ANS: COMPONENTS**

**• Matrix**

**• Filler**

**• Coupling Agent**

**• Initiators and accelerators**

**• pigments**

**And components, resin matrix (organic content )fillers ,(in organic part ) and coupling agents. The resin matrix consist mostly of BIS-GMA.(bisphenol –A-glycidyldimethacrylate)**

 **RESIN MATRIX**

**• Bis-GMA (bisphenol-A glyceril methacrylate)**

**• UDMA (urethane dimethacrylate)**

**• TEGDMA (triethylene glycol dimethacrylate)**

 **COLOR DETERMINATION**

**• Should be as close to that of the natural tooth as possible**

 **USES COMPOSITE MATERIAL**

**• Flowable**

**• Condensable / Packable**

 **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 COMPOSITE**

**• Has a filler particle that inhibits the filler particles by sliding to one another**

* **Stiffer, thicker feel**

 **CLINICAL USE**

* **Light –stress area**
* **Light –stress area requiring improved polishability (classes 1,2,3,4,)**
* **Ligh stress area requiring improved polishability (classes 3,4,)**
* **Situations in which improved condensability is needed ( classes 1,2)**
* **Situations in which improved flow is needed and or where access is difficult (class 2)**