PAPER DENTAL MATERIAL

TEACHER NAME SIR USMAN

STUDENT NAME TARIQ KHAN

ID NO 14484

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Q#1 Discuss glass ionomer cement briefly ?

ANS: GLASS IONOMER CEMENT :

Introduction

• Glass ionomer cement is a tooth colored material, introduced by Wilson & Kent in 1972.Material was based on reaction between silicate glass powder & polyacrylic

acid. They bond chemically to tooth structure & release fluoride for relatively long period

CLASSIFICATION :

• Type I. For luting

• Type II. For restoration

• Type III. For liner & bases

• Type IV. Fissure & sealent

• Type V. As Orthodontic cement

• Type VI. For core build up atively long period.

COMPOSITION:

• These material may be supplied as a powder and liquid or as a powder mixed with liquid for clinical used.

•POWDER FORM:

• Silica 41.9%• Alumina 28.6%

• Alumina fluoride 1.6%

• Calcium fluoride 15.7%

• Sodium fluoride 9.3%•LIQUID FORM:

• Polyacrylic acid

• Tartaric acid

• Water

SOLUBILITY AND DISINTEGRATION:

• Initial solubility is high due to leaching of intermediate products.

• The complete setting reaction takes place in 24 hrs, cement should be protected from saliva during this period

USES:

• Anterior esthetic restoration material for class III & V restorations.• For luting.

• For core build up.

• For eroded area .• For atraumatic restorative treatment.

• As an orthodontic bracket adhesive.

• As restoration for deciduous teeth.

MANIPULATION:

• 1. Preparation of tooth surface• 2. Proportion & mixing

• 3. Protection of cement during setting • 4. Finishing

• 5. Protection of cement after setting PROTECTION OF CEMENT DURING SETTING:

• Glass ionomer cement is extremely sensitive to air & water during setting.

• Immediately after placement into cavity preshaped matrix is applied to it. FINISHING:

• Excess material should be trimmed from margins.

• Hand instruments are preferred to rotary tools to avoid ditching.

>further finishing as done after 24 HRS

PROTECTION OF CEMENT AFTER SETTING:

• Before dismissing the patient ,restoration is again coated with the protective agent to protect trimmed area.• Failure to protect for first 24hrs results in weaken cement.

 ADVANTAGES:

• Inherent adhesion to the tooth surface.• Good marginal seal.• Anti cariogenic property.• Biocompatibilty• Minimal cavity preparation required• Easy to manipolation • Permanente restoration material• Permanente cementation material

 DISVANTAGES:

• Low fracture resistance.• Low wear resistance.• Water sensitive during setting phase .• Less esthetic compared to composite.

Q#2 Differentiate permanent cement,luting agent and temporary cement ?

ANS: PERMANENT CEMENT

• For the long term cementation of cast ‑ restorations such as inlays, crowns, bridges, laminate veneers, and orthodontic fixed appliances.

LUTING AGENT

• A material that acts as an adhesive to hold together the casting to the tooth structure. Luting agents are designed to be either permanent or temporary.

TEMORARY CEMENT

• Temporary cements are used when the restoration will have to be removed. Most commonly, temporary cement is selected for the placement of provisional Coverage.

Q#3 Write a detail note on manipulation, advantages and disadvantages of zinc oxide eugenol cement?

ANS: ZINC OXIDE EUGENOL:

(ZOE) cement is introduced in 1858 and widely used in dentistry for temporary luting and permanent luting temporary restoration base liner

 MANIPULATION:

• Powder/liquid ratio is 1.0 parts of powder to 1 part of liquid.• Using a small area of the pad surface.• Instrument should be cleaned before the cement sets on them.

• MIXING TIME:• Mixing time is 2 to 3 mins • SETTING TIME:

• Surface hardens in about 20 to 30 mins. Complete hardening takes place in 2-3 hrs

 ADVANTAGES:

• Inexpensive• Easy to manipulation• Dimensional stability• Good surface detail• Can be added to with fresh zinc oxide eugenol• Non toxicDISADVANTAGES:

• Cannot be used in very deep undercuts• Only sets quickly in thin section• Eugenol allergy in some patients.

Q#4 briefly explain polycarboxylate cement?

ANS POLY CARBOXYLATE CEMENT.

• Zinc polycarboxylate cement was the first cement that was developed with the property of an adhesive bond to tooth structure along with some metallic

restoration. AVAILABILITY

• Zinc polycarboxylate cement is available as powder and liquid

 COMPOSITION:
POWDER

• Zinc oxide 89%• Magnesium oxide 9%• Barium oxide 0.2% • Other oxides 1.4%• (Bismuth trioxide, Calcium oxide)

LIQUID FORM:

• Polyacrylicacid or 32 to 48%

copolymer of acrylic acid • Other carboxylic acids, 30% to 50%

such as itaconic acid or maleic acid PROPERTIES OF ZINC POLY CARBOXYLATE:

• pH of liquid in zinc polycarboxylate:1.7• It is highly bio compatible to the pulp which is similar to ZOE cements.• Working time 2.5 minutes• Setting time is 6 to 9 minutes• Solubility : 0.6 % (water solubility)• Film thickness: it is more viscous than zinc phosphate cement.

MANIPULATION OR MIXING ZINC POLY CARBOXYLATE CEMENT:

• Powder/liquid ratio is 1.5 parts of powder to 1 part of liquid.• Using a small area of the pad surface.• Mixing time is 30 to 60 seconds• Cement should be used immediately becouse the working time is short

• Working time 2.5 minutes• Setting time is 6 to 9 minutes• Instrument should be cleaned before the cement sets on them.

USES OF POLY CARBOXYLATE:

• Permanent cementation for• Crowns• Bridges• Inlays• Onlays• Orthodontic cementation

ADVANTAGES:

• Low irritancy• Adhesion to tooth• Easy manipulation • Strength tensile• Solubility (similar to zinc phosphate)• Film thickness (similar to zinc phospahate)

 DISADVANTAGES:

• Poor esthetic• Solublityhigh

Q#5 Distinguish liquid powder ratio of zinc phosphate also write its uses and advantages?

ANS: ZINC PHOSPHATE CEMENT :

• Zinc phosphate cement are the oldest material and widely used in dentistry for luting permanent metal restoration.

POWDER FORM:

• Zinc oxide • Magnesium oxide• Other oxide and flouride

 LIQUID FORM:

• Phosphate acid

• 30 – 40 % water • Zinc oxide and aluminum hydroxide as buffering agent(buffering agent is a weak acid or base used to maintain the acidity).

USES

• Final cementation of cast metal restoration • Cavity base• Temporary filling material • Cementation of orthodontic bands

ADVANTAGES

• Inconspicuous appearance• Speed and case of usage• Low thermal conductivity beneath a metallic restoration.