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And Q 1.

Glass ionomer cement…

* Tooth color meterial
* Introduce by Wilson and Kent in 1972.
* Based on reaction between silicate glass powder and polyacrylicacid.
* Chemically bond to tooth structure.
* Release fluoride for long time.

Classification

Type 1. For luting

Type2. For restoration

Type3. For liner and base

Type4. For fissure and sealent

Type5. Use as orthodontic cement

Type6. For core buildup

Composition

Glass ionomer cement is present in powder and liquid form and mixed for clinical purpose with each other.

Powder :

* Silica. 41.9%
* Alumina. 28.6%
* Alumina fluoride. 1.6%
* Calcium fluoride. 15.7%
* Sodium fluoride. 9.3%

Liquid :

* Polyacrylic acid
* Tartaric acid
* Water

Solubility and disintegration

* Initial solubility is high due to leaching of intermediate products.
* Complete setting reaction take place in 24 hrs, during this period cement should be protected from saliva.

Manipulation

* 1. Preparation of tooth surface
* 2. Preparation and mixing.
* 3. Protection of cement during setting.
* 4. Finishing.
* 5. Protection of cement after setting.

1. Preparation of tooth surface.

Glass ionomer cement require tooth surface preparation and caries removal because if we didn’t remove caries so the bond of glass ionomer cement will be week and filling fall out can be happened and also caries progress can be happened.

1. Preparation and mixing.

Preparation and mixing is also very important for glass ionomer cement, that is we should prepare and mixed the powder and liquid with proper ratio. Ratio of mixing is depend up on what we are doing for example if we doing filling then the mixing ratio of glass ionomer cement powder and liquid is 1:1 and if we use the glass ionomer cement for luting then the mixing ratio should be 1:2.

1. Protection of cement during setting.

Glass ionomer cement is extremely sensitive to air and water during setting, so after placement we should immediately protect glass ionomer cement from air and water through application of matrix.

1. Finishing.

Excess meterial should be trimmed from margins, hand instruments are preferred to avoid ditching, and further finishing is done after 24 hrs.

1. Protection of cement after setting.

Before free the patient cement should be protected for the next 24 hrswith protective agents.

Advantages

* Adhese easily to tooth surface
* Good marginal seal.
* Anti cariogenic property.
* Biocompatibilty.
* Minimal cavity preparation required.
* Easy manipulation.
* Permanent restoration meterial.
* Permanent cementation meterial.

Disadvantages

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

Uses

* Restoration meterial for class 3 and class 5 in interior teeth.
* For luting.
* For core buildup.
* For eroded area.
* For atraumatic restorative treatment.
* As orthodontic bracket adhesive.
* As restoration for deciduous teeth.

Ans Q 2.

Permanent cement.

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

So permanent cement are those which is used for long time and for permanent restoration purpose.

Luting agents.

* A meterial that acts as an adhesive to hold together the casting to tooth structure .luting agents are designed to be either permanent or temporary. For example type 1 glass ionomer cement for permanent luting and zonaline for temporary luting

Temporary cement.

* Temporary cements are use when the restoration will have to be removed. Most commonly, temporary cement is selected for the placement of provisional coverage.

Ans Q 3.

Manipulation of zinc oxide eugenol cement.

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

Mixing time:

* Mixing time is 2 to 3 mints.

Setting time :

* Surface hardens in about 20 to 30 mints. Complete hardening takes place in 2 to 3 hrs.

Advantages.

* Inexpensive
* Easy to manipulate
* Dimensional stability
* Good surface detail
* Can be added to with fresh zinc oxide eugenol
* Non toxic
* Easily available

Disadvantages

* Cannot be used in very deep under cuts.
* Only sets quickly in thin section.
* Eugenol allergy in some patients.

Ans Q 4.

Polycarboxylate 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

* Polyacrylic acid or copolymer of acrylic acid. 32 to 48%
* Other carboxylicacids, such as itaconic acid or maleic acid. 30 to 50%

Properties

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

Manipulation

* Powder/liquid ratio is 1.5:1
* Using a small area of pad surface.
* Mixing time is 30 to 60 seconds.
* Cement should be used immediately because the working time is short.
* Working time is 2.5 minutes.
* Setting time is 6 to 9 minutes.
* Instruments should be cleaned before the cement sets on them.

Uses

* Permanent cementation for

Crowns

Bridges

Inlays

Onlays

Orthodontic cementation

Advantages

* Low irritancy
* Adhesive to tooth
* Easy manipulation
* Strength tensile
* Solubility (similar to zinc phosphate).
* Film thickness :similar to zinc phosphate)

Disadvantages

* Poor esthetic
* Solubility high

Ans Q 5.

Zinc phosphate cement in liquid

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

Zinc phosphate cement in powder

* Zinc oxide
* Magnesium oxide
* Other oxide and fluoride

Zinc phosphate cement powder and liquid ratio is 1.5 to 1.

But it can be different in cases where we require more time for manipulation.

Uses

* Final cementation of cast metal restoration.
* Cavity base.
* Temporary filling meterial.
* Cementation of orthodontic bands.

Advantages

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

Disadvantages

* Slight solubility in mouth fluids
* Opaque material not soluble for visible surface.