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**Midterm Assignment 30 Marks**

**Department AHS Semester DT 4th**

* **Attempt all questions, all questions carry equal marks.**

Q1. Discuss glass ionomer cement briefly?

Answer: no 1 :

Introduction:

* Introduce by Wilson and kent in 1972.
* Tooth colored material.
* Based on reaction between silicate glass powder and polyacrylic acid.
* Bond chemically to tooth structure .
* Release fluoride for relatively long period.

Composition :

present in two form :

1. powder (2) liquid

powder mixed with liquid for clinical used.

Composition of powder:

* silica 41.9%
* alumina 28.6%
* alumina fluoride 1.6%
* calcium fluoride 15.7%
* sodium fluoride 9.3%

composition of liquid:

* polyacylic acid
* tartaric acid.
* Water.

Solubility and disintegration:

* Initial solubility is high due to leaching of intermediate products.
* Complete setting reaction takes place in 24 hours. Cement should be protected from saliva during this period.

Manipulation:

1. Preparation of tooth .
2. Proportion and mixing.

(3)Protection of cement during setting:

* Glass ionomer cement is extremely sensitive to air and water during setting.

(4)finishing :

* excess material should be trimmed form margins.
* Hand instrument are preferred to rotary tools to avoid ditching.
* Further finishing is done after 24hrs.

(5) 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 .

Uses of glass ionomer cements:

* For luting.
* Anterior esthetic restoration material for class III and V restoration.
* For core build up.
* As an orthodontic bracket adhesive.
* As restoration for deciduous teeth.
* As atraumatic restorative treatment.

Advantages:

* Good marginal seal.
* Anti cariogenic property.
* Inherent adhesion to the tooth surface.
* Biocompatilbilty.
* Easy to manipulation.
* Permanente cementation material.
* Permanente restoration material.

Disadvantages:

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

 Q2. Differentiate permanent cement, luting agent and temporary cement.

Answer no 2:

Dental cement:

* Material sets intra orally.
* Used to join a tooth and a prosthesis or restoration of carious tooth.

Classification of Cements:

1. Luting agent (permanent and temporary cement)
2. Restorative applications.
3. Liner or base applications.

Permanent Cement:

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

Luting Agent:

* Material that acts as an adhesive to hold together the casting to the tooth structure.
* Designed to be either permanent or temporary.

Temporary Cement .

* Used when the restoration will have to be removed.
* Commonly , temporary cement is selected for placement of provisional coverage.

Different Between Luting Agent , Permanent Cement , And Temporary Cement,

|  |  |  |
| --- | --- | --- |
| Luting agent.* Material hold together.
* Casting to the tooth structure.
* May be permanent or temporary.
 | Permanent cement.* For long term cementation.
* Of cast restoration.
* E.g inlays , crown, bridges.
 | Temporary cement.* For short term cementation.
* Used when restoration will have removed.
* Selected for the placement of provisional coverages.
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Q3. Write a detail note on manipulation, advantages and disadvantages of Zinc Oxide Eugenol cement.

Answer no 3:

Zinc oxide eugenol cement:

* Introduced in 1858.
* Widely used in dentistry.
* For temporary luting and permanent luting temporary restoration, base liner.

Classification .

* Type I ZOE: For temporary cementation.
* Type II ZOE: Permanent cementation.
* Type III ZOE: Temporary restoration.
* Type IV ZOE: Cavity base liners.

Manipulation of zinc oxide eugenol cement:

* Powder liquid ratio
* Part of powder is 1.0
* Part of liquid is 1
* Pad surface
* Using a small surface of pad surface.
* Instrument:
* Instrument should be cleaned before the cement sets on them.
* Mixing time:
* Mixing time is 2 to 3 minutes.
* Setting time:
* Surface hardens in about 20 to 30 minutes.
* Complete hardening takes place in 2 to 3 hours.

Advantages :

* Easy to manipulation.
* Inexpensive.
* Dimensional stability.
* Non toxic.
* Can be added to with fresh zinc oxide eugenol.
* Good surface detail.

Disadvantages:

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

Q4. Briefly explain polycarboxylate cement.

Answer No 4:

Poly carboxylate cement:

* First cement that was developed with the property of an adhesive bond to tooth structure along with some metallic restoration.

Availability:

* in powder and liquid form.

Powder composition:

* zinc oxide 89%
* magnesium oxide 9%
* barium oxide 0.2%
* other oxides 1.4%

(bismuth trioxide , calcium oxide)

Liquid composition:

* polyacrylicacid or copolymer of acrylic acid: 32% to 48%
* other carboxylic acids, such as itaconic acid or maleic acid: 30% to 50%.

Properties of zinc polycarboxylate:

* the PH of liquid in zinc polycarboxylate is : 1 :7
* working time 2.5 minutes.
* Solubility : 0.6 % water solubility.
* Film thickness: it is more viscous than zinc phosphate cement.

Manipulation or mixing of zinc polycarboxylate cement:

* Powder /liquid ratio .parts of powder is 1.5 : parts of liquid 1 .
* Using a small area of the pad surface.
* Maxing time is 30 to 60 seconds.
* Cement should be used immediately because the working time is short.
* working time 2.5 minutes.

Uses of polycarboxylate:

Permanent cementation for

* Crown
* Bridges
* Inlays
* Orthodontic cementation.

Advantages :

* Adhesion to tooth.
* Low irritancy.
* Easy manipulation.
* Strength tensile.

Disadvantages

* High solubility
* Poor esthetic.

Q5. Distinguish liquid powder ratio of Zinc phosphate cement, also write its uses and advantages :

Answer No 5:

Zinc phosphate cement :

* zinc phosphate cement are the oldest material and widely used in dentistry for luting permanent metal restoration .
* present in two form powder and liquid.

Distinguish liquid powder ratio of zinc phosphate cement

|  |  |
| --- | --- |
| Powder form* Zinc oxide
* Magnesium oxide
* Other oxide and fluoride.
 | Liquid form* Phosphate acid
* 30 – 40 % water.
* Zinc oxide and aluminum hydroxide as buffering agent.
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|  |  |

Uses of zinc phosphate:

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

Advantages of zinc phosphate cement:

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