PERIODONTICS

67. Specific plaque hypothesis states that:

a. All plaque is pathogenic
b. Plaque is pathogenic where signs of disease are present
c. Only specific microbes cause caries
d. Special tests are available for caries detection

CONSERVATIVE AND ENDODONTICS

68. A patient came to dentist with decayed mandibular 1st molar. On cavity preparation the mesiobuccal cusp and distobuccal cusp were found to be having deep caries. Treatment of choice is:

a. Compomer
b. Cast metal
c. Intermediate restorative material
d. Glass ionomer cement

69. Which is the form prepared during cavity preparation in which enough room is established so as a restorative material can be placed without fracture to withstand occlusal forces?

a. Outline form
b. Resistance form
c. Retention form
d. Convenience form

70. According to schilders principle of biomechanical preparation in root canal cleaning and shaping:

a. Prepare root canal according to obturating material
b. Minor apical foramen diameter can be enlarged at least three to five times that of first binding file
c. The shape of apical foramen can be changed or moved easily as required
d. The minor diameter of apical foramen should be altered minimally

71. The wavelength of conventional light curing tip is:

a. 400–500 nm b. 200–300 nm
c. 1000–2000 nm d. 600–700 nm

72. After a trauma in a child, a tooth which got avulsed was reimplanted and reviewed for 2 years shows no mobility, pain, infection or swelling but there is loss of lamina dura radiographically. On percussion, there is a high pitched sound. It is due to?

a. Replacement resorption
b. External resorption
c. Internal resorption
d. Cervical resorption

73. Which is a solid solution?

a. Amalgam b. Co – Cr
c. Pd – Ag d. Ga – Ag

PEDODONTICS

74. A 3 years and 7 months old child with history of traumatic intrusion of primary maxillary central incisor. The incisor is not in occlusion and does not cause interference and IOPA reveals fore shortening. What should be done?

a. The tooth should be allowed for passive and spontaneous repositioning itself
b. Be repositioned and splinted
c. Be extracted
d. Reduce the opposing tooth

75. Space maintainers are categorized into which level of health promotion:

a. Rehabilitation
b. Specific protection
c. Disability limitation
d. Health promotion

76. Best physiologic medium to transport an avulsed tooth, which is not to be reimplanted immediately?

a. Milk b. Coconut water
c. HBSS d. Viaspan

77. A tooth like process at level of alveolar gingiva is seen in the mandibular anterior region in two months old child with no radiographic evidence of roots. The treatment needed is:

a. Surgically remove under LA
b. Do not extract and reassure the parents
c. Let it remain as it may become a tooth later after 6 months following root completion
d. Extract if mobile under GA

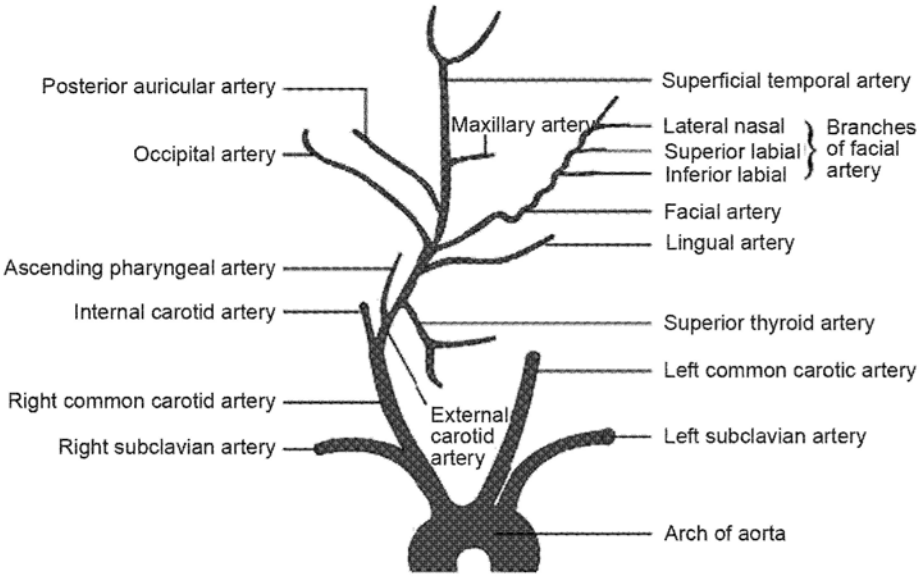

Fig. 1

- ***Branches*:**

Name of the branches	*Distribution*
Anterior branches	
· Superior thyroid artery	· Larynx, thyroid gland
· Lingual artery	· Oral floor, tongue
· Facial artery	· Superficial facial region
Medial branches	
· Ascending pharyngeal artery	· Plexus of the skull base
Posterior branches	
· Occipital artery	· Occiput
· Posterior auricular artery	· Ear
Terminal branches	
· Maxillary artery	· Masticatory muscles, posteromedial part of the facial skeleton, meninges
· Superficial temporal artery	· Temporal region, part of the ear

- ***Superior thyroid artery:***
  - Arises from the anterior aspect of the ECA just below the tip of the *greater cornu of the hyoid bone*
  - Runs downwards and forwards, parallel and superficial to the external laryngeal nerve to reach the upper pole of the thyroid gland

Relationship of superior thyroid artery with the external laryngeal nerve: *The superior thyroid artery is close to the external laryngeal nerve proximally and lies anterolateral to it. It diverges from the nerve near the thyroid gland where the artery lies superficial to the upper pole and the nerve lies deep to it.*
Therefore, *in thyroidectomy to avoid injury to the nerve the artery should be ligated as near to the gland as possible*

- ***Branches*:**
  - *Infrahyoid branch*
  - *Sternocleidomastoid branch*
  - *Superior laryngeal artery*
  - *Glandular branches*
- ***Lingual artery*:** Arises at the *tip of the greater cornu of the hyoid bone.* Course is divided into three parts *by hyoglossus muscle*
  - ***First part*** lies in the carotid triangle and forms a characteristic loop with its convexity directed upwards reaching above the greater cornu of hyoid bone
    - This loop permits free movement of hyoid bone
  - ***Second part*** lies deep to hyoglossus muscle
  - ***Third part*** *(also called arteria profunda linguae or deep lingual artery).* First it runs upwards along the anterior border of the hyoglossus and then forwards on the under surface of the tongue where it Anastomoses with its fellow of opposite side

- In the blood, it mainly circulates in a stable non covalent complex with von Willebrand factor.

  ⇩

  Upon activation by thrombin, (factor IIa), it dissociates from the complex to interact with factor IXa in the coagulation cascade. It is a cofactor to factor IX a in the activation of factor X, which in turn with its cofactor factor Va, activates more thrombin.
- Thrombin cleaves fibrinogen into fibrin which polymerizes and crosslinks (using factor XIII) into a blood clot
- No longer protected by vWF, activated factor VIII is proteolytically inactivated in the process (*prominently by activated protein C and factor IXa)* and quickly cleared from the blood stream
- ***Note:*** *Factor VIII is not affected by liver disease, in fact levels usually rises in such instances*
- Each bag of ***cryoprecipitate*** contains approx 100U of factor VIII, and each unit of ***FFP*** contains approx 1 factor VIII unit/mL or approx 230 factor VIII units. Now days rarely used
- The half life of VIII after transfusion is *8 to 12 hours*

- ***Factor XI*** is stable in plasma when stored at 4°C or –20°C. Thus stored blood, liquid plasma, FFP, or SD plasma can be used to replace factor IX
- ***3 components of factor VIII:***
  - *A clot promoting factor—absent in classic hemophilia*
  - *Factor VIII antigen*
  - *von Willebrand's factor*
- In hemophilia, one of these factors is missing, in von Willebrand's disease, all three are missing.

DENTAL MATERIALS

14. ***d. Compressive strain***

(Phillips' science of dental materials, 11th edition, page 54; applied dental materials by McCabe, 9th edition, page 6; introduction to dental materials by Richard Van Noort, 4th edition, page 32)

- ***To understand this question, we should first know what is stress and strain and stress-strain curve. Read below….***

"**Stress:** When an external force is applied to a body or specimen of material under test, an internal force, equal in magnitude but opposite in direction, is set up in the body." —*McCabe*

"Stress is the force per unit area acting on millions of atoms or molecules in a given plane of material. Except of certain flexural situations, such as four-point bending specimens, and certain nonuniform object shapes, stress typically decreases as a function of distance from the area of the applied force or applied pressure" —*Phillips'*

- ***Hence stress is internal force of an object against external force applied.***

"Strain, or the change in length per unit length, is the relative deformation of an object subjected to a stress. Strain may be either elastic or plastic". —*Phillips'*

"**Strain:** The application of an external force to a body or test specimen results in a change in dimension of that body. For example, when a tensile force is applied the body undergoes an extension, the magnitude of which depends on the applied force and the properties of the material" —*McCabe*

- ***Hence strain is the actual deformation which results from an applied force.***
- ***So in question they have asked about deformation, answer should be in strain. Options A and B are clearly ruled out. Read further…***

"A tensile stress is caused by a load that tends to stretch or elongate a body. A tensile stress is always accompanied by tensile strain." —*Phillips'*

"If a body is placed under a load that tends to compress or shorten it, the internal resistance to such a load is called a compressive stress. A compressive stress is associated with a compressive strain." —*Phillips'*

- ***In question they have asked about "force applied", so here in compressive stress force is applied and in tensile stress object is under stretch. Supporting our answer towards Compressive strain. Read below…***

"Compressive stress – compressive force per unit area perpendicular to the direction of applied force" —*Phillips'*

- ***Considering all above statements from textbooks, we have come to conclusion of compressive strain as our answer.***

18. *c. To reduce softening or fusion temperature*

"Plasticizers are often added to resins to reduce their softening or fusion temperatures. It is possible to plasticize a resin that is normally hard and stiff at room temperature to a condition in which it is flexible and soft by including a plasticizer in the resin" *(Phillip's Dental Materials by Anusavice, 11th edition, page 152)*

- Plasticizer acts to partially neutralize secondary bonds or intermolecular forces that normally prevent the resin molecules from slipping past one another when the material is stressed
- ***External plasticizer***: In some cases, the action is analogous to that of a solvent, with the plasticizing agent penetrating between the macromolecules and increasing the intermolecular spacing
- ***Internal plasticizer***: Plasticizing a resin can also be accomplished by coopolymerization with a suitable comonomer. In this case, the plasticizing agent becomes part of the polymer and thus acts as an *internal plasticizer*
- *Plasticizer* usually reduce the strength, hardness and the softening point of the resin.

19. *c. Increases strength*

"The dental porcelain is usually colored by the addition of concentrated color frit. High temperature resistant pigments, generally metal oxides are added into the basic glass used in porcelain manufacture" *(Textbook of Dental Materials by Sharmila Hussain, 1st edition, page 202)*

- ***Hence option A is true and cannot be the answer here. Read further…***

Some oxides used for coloring dental porcelain		
Indium	In_2O_3	Ivory
Iron	Fe_2O_3	Brown
Nickel	NiO	Brown
Cobalt	CoO_2	Blue
Copper	CuO	Green
Chromium	Cr_2O_3	Green
Manganese	MnO_2	Lavender
Vanadium	V_2O_5	Brown; yellow-green
Titanium	TiO_2	Yellow-brown; opaque white
Tin	SnO_2	Opaque white
Zirconium	ZrO_2	Opaque white
Zinc	ZnO	Opaque white

"Traditional feldspathic porcelains remain the material of choice for mimicking natural tooth structure. They have a natural tendency that can be modified with metal oxides to create a wide range of translucencies and shades, but their brittleness means that they cannot be used without some support from tooth structure or a higher strength coping" *(Esthetic Dentistry in Clinical Practice by Marc Geissberger, page 12–13)*

- ***Hence option B is also true and cannot be the answer here. Read further…***

  "The opportunity exists therefore for an intermediate layer between the porcelain and the metallic substrate, i.e. an oxide coat to which both may adhere strongly. Otherwise, an intermediate metal or metals may have to be deposited. Mostly however, special alloys have been developed for this technique to meet the severe demands:
  - *The solidus temperature must be high to permit the fusing of the porcelain without melting the metal*
  - *The thermal expansion of alloy and porcelain must be properly matched to generate the required compressive stress in the porcelain*
  - *The metal should not creep or sag at the firing temperatures (i.e. under its own weight); similarly, appreciable grain growth should not occur*
  - *Finally, the alloy surface must oxidize to be wetted by and react with the porcelain to form the band" (Materials Science for Dentistry by BW Daarvell, 9th edition, page 562)*

20. *d. Polysulfide*

"Condensation or step growth polymerization: In this slow polymerization occurs by a series of localized condensation reactions between primary compounds by random and continuous repetitions which mostly produce a by-product of low molecular weight like water, ammonia and halogen acids. Polysulfide rubbers are formed by condensation reaction" *(A TB of Dental Materials by Chandra, 2007, 1st edition, page 93)*

Chemistry of polymerization (Phillips' Dental materials, 11th edition)

- ***In addition polymerization:*** Monomers are activated one at a time and add together in sequence to form a growing chain
- ***In step-growth or condensation polymerization:*** The components are difunctional and all are, or become, reactive simultaneously.

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