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ANA 301

ASSIGNMENT 2

QUESTION 1

Cavernous sinus: A large channel of venous blood creating a "sinus" cavity bordered by the sphenoid bone and the temporal bone of the skull. The cavernous sinus is an important structure because of its location and its contents.

LOCATION

The cavernous sinus is located on either side of the sella turcica and superior to the sphenoid bone.

BLOOD SUPPLY

The cavernous sinus is made up of very thin walled veins that make up a venous plexus. The cavernous sinus receives venous blood from the following:

-Superior middle cerebral vein

-Superior and inferior ophthalmic veins

-Sphenoparietal sinus

Venous blood drains posteroinferiorly to eventually empty into the pytergoid plexuses.

CONTENTS

-Internal carotid arteries & its small branches

-Carotid plexus of sympathetic nerve

-Abducens nerve (CN VI)

-Maxillary nerve (CN V2)

-Oculomotor nerve (CN III)

-Ophthalmic nerve (CN V1)

-Trochlear nerve (CN IV)

FUNCTION

Facilitate heat exchange from the between arterial and venous blood as they transverse each other.

CLINICAL APPLICATION

Cavernous Sinus Thrombosis**:**

The veins of the face drain blood into the cavernous sinus via the superior ophthalmic vein. As such, infections of the face (particularly those involving the "danger triangle" (orbits, nasal sinuses, and superior part of the face) can cause a cavernous sinus thrombosis.

-Staphylococcus aureus is seen in up to 70% of patients with this complication

-Other bacteria include: Streptococcus, H. influenza

Patients presenting with cavernous sinus thrombosis will usually complain of a headache, a cranial nerve deficit involving CN III, IV, V1, V2, and/or VI, and unilateral eye swelling that progresses to bilateral eye swelling.

Treatment**:**

Empiric antibiotics to include:

Vancomycin 15 mg/kg IV every 12 hours + ceftriaxone 2 g IV every 12 hours If source is dental, add on metronidazole Treatment duration is influenced by underlying cause and organism. Heparin or low-molecular weight heparin at full doses

QUESTION 2

**Medial wall(Nasal Septum)**

The nasal septum partitions the nasal cavity into two equal but separate compartments. Cartilage and bone comprise the nasal septum. It is covered by squamous epithelium, which differs from the lateral walls of the nasal cavity. A portion of the anterior septum is covered in erectile tissue. It also contributes to lateral projections called the upper lateral cartilages, which makes up the middle third of the nose. The bony segment of the septum is pneumatized, and when it over expands, it has the potential to obstruct airflow. Below are the components of the septum:

-Quadrangular (septal) cartilage: This is the most anterior portion of the septum. It contains the Kiesselbach plexus.

Attachments:

Superior: nasal bone

Inferior: anterior nasal spine of the maxilla

Posterior-Superior: perpendicular plate of the ethmoid

Posterior-Inferior: vomer and maxillary crest

-Perpendicular Plate of the Ethmoid:This is a vertical projection from the cribriform plate of the ethmoid inferiorly to the septal cartilage.

-Vomer: Located inferior and slightly posterior to the perpendicular plate of the ethmoid. It is attached inferiorly to the nasal crest of the maxilla and palatine bone.

**Lateral Wall of the Nasal Cavity**

The nasal cavity's lateral wall has three medially projecting inferiorly curved bones called conchae. The middle and superior conchae are part of the ethmoid bone, whereas the inferior concha is a separate bone altogether. There is a normal variant called the supreme conchae. These conchae, when covered by mucosa, are termed turbinates. The turbinates augment the surface area of the nasal cavity to aid in its functions of humidifying, warming, and humidifying the air. The turbinates create four channels.  Three of these channels are termed meatuses, and the fourth is the sphenoethmoidal recess.

Bones of the lateral wall:

-Ethmoid bone

-Perpendicular plate of the palatine bone

-The medial plate of the pterygoid process of the sphenoid bone

-Medial surface of the lacrimal and maxillary bones

-Inferior concha.

Sphenoethmoidal Recess:Located superior to the superior turbinate and inferior to the nasal cavity roof, which is the drainage site of the sphenoid sinus.

Meatuses

-Superior Meatus: located inferior to the superior turbinate and superior to the middle turbinate; this is the drainage site of the posterior ethmoid sinus.

-Middle Meatus: located inferior to the middle turbinate and superior to the inferior turbinate - there are several structures within this meatus. This is the drainage site of the frontal, anterior ethmoid, and maxillary sinuses.

-Inferior Meatus: Located inferior to the inferior turbinate and superior to the floor of the nasal cavity. The nasolacrimal duct drains tears from the lacrimal sac at the medial aspect of the eye into the anterior portion of this meatus via Hasner's valve.

Sphenopalatine Foramen: This foramen connects the nasal cavity to the pterygopalatine fossa and is posterior to the middle turbinate in the posterior portion of the superior meatus. The significant content of this foramen is:

-Sphenopalatine artery of the maxillary artery

-Nasopalatine branch of the maxillary nerve of the trigeminal nerve (CNV2)

-Posterior superior lateral nasal nerves of CNV2