

ONYEMA FAVOUR CHINAZAM

17/MHS01/266

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GROSS ANATOMY ASSIGNMENT 2

1 Write an essay on the Cavernous sinus

Cavernous Sinus

The cavernous sinuses in the human head are large venous plexuses and are located at the middle cranial fossa on each side of the sella turcica on the upper surface of the body of the sphenoid which contains sphenoidal sinuses. It is one of the dual venous sinuses creating a cavity called the lateral sellar compartment bordered by the temporal bone lateral to the sella turcica. It is of great importance because of the connections and structures passing through them.

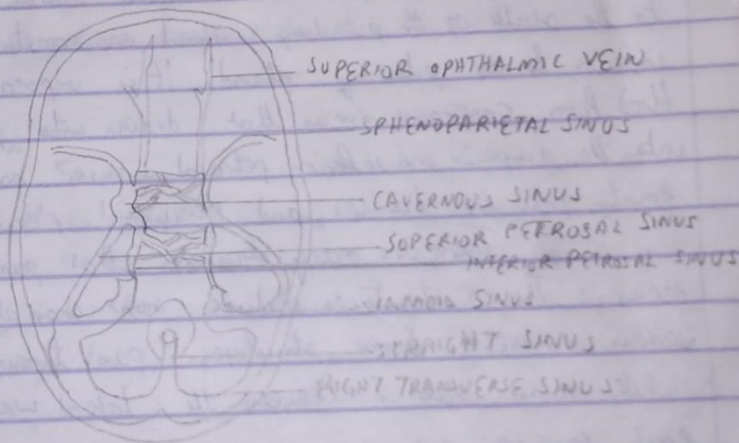


DIAGRAM SHOWING INTERIOR OF BASE OF CRANIUM:

The cavernous sinus is a network of veins that sit in a cavity approximately 1x2cm in size in an adult. It consists of a venous plexus of extremely thin-walled veins that extends from the superior orbital fissure anteriorly to the apex of the petrous part of the temporal bone posteriorly. The cavernous sinus receives blood from;

- i Cerebral veins Superficial middle cerebral veins
- ii Superior and inferior ophthalmic veins
- iii Sphenoparietal sinus
- iv Inferior cerebral veins

iv And sometimes emissary veins (although the emissary vein usually drains blood from the cavernous sinus it may supply blood too)
Blood leaves the cavernous sinus through posterior inferiorly through

i Superior and inferior petrosal sinuses

ii Emissary veins (these are valveless and bidirectional)

These veins pass through the foramina of the skull through the foramen ovale. There are also connections with the pterygoid plexus of veins via inferior ophthalmic vein, deep facial vein and emissary vein.

The Right and Left wall of the cavernous sinus communicate through ~~the~~ anteriorly and posteriorly through the intercavernous sinuses. The venous channels in the cavernous sinus also communicate with each other through intercavernous sinuses anterior and posterior to the stalk of the pituitary gland and sometimes through veins inferior to the pituitary gland. It is important to note that blood from cavernous sinus that drains into postero-inferiorly into the superior and inferior petrosal sinuses and emissary veins empty into the basilar and pterygoid plexus.

There are many structures that pass through the cavernous sinus. These structures include some cranial nerves and some venous sinuses. Some structures pass through the lateral walls while some pass in between the lateral walls (i.e. they pass through each cavernous sinus).

Structures passing through the medial wall of cavernous sinus (through each cavernous sinus) are Internal Carotid artery accompanied and surrounded by Internal Carotid plexus of sympathetic nerves and Abducent nerve (Cranial nerve VI).

Structures passing through the outer lateral wall of the cavernous sinus are Oculomotor nerve (Cranial nerve III), Trochlear nerve (Cranial nerve IV), Ophthalmic and maxillary division of the Trigeminal nerve (Cranial nerve V).

Function.

i It allows cooling of blood before it reaches the brain especially in horses and cheetahs

ii) Populations of arteries within the cavernous sinus promote population of venous blood from the sinus

iii) Cavernous sinus as a venous sinus receives blood from superior and inferior ophthalmic veins, ^{and superior ophthalmic veins} and drains into superior and inferior petrosal sinuses and ultimately into internal jugular vein via sigmoid sinus.

Nearest structures of cavernous sinus

i) Superiorly: optic tract, optic chiasm, internal carotid artery

ii) Inferiorly: Foramen lacerum, junction of the body, greater wing of sphenoid

iii) Medially: Hypophyseal gland (hypophysis cerebri) and sphenoidal air sinus

Laterally: Temporal lobe with uncus

Anteriorly: Superior orbital fissure and apex of orbit

Posteriorly: Apex of petrous temporal bone

Clinical Anatomy

I Cavernous Sinus Syndrome: It is caused by mass effect of tumors of the pituitary gland causing Ophthalmoplegia (due to compression of the oculomotor nerve, trochlear and abducent nerve), Ophthalmic sensory (due to compression of ophthalmic nerve) and Maxillary sensory loss (due to compression of the maxillary nerve). This syndrome is a medical emergency requiring prompt medical attention.

2. Discuss the walls of the nose

Walls of the Nose

The nose is the part of the respiratory tract superior to the hard palate and contains the peripheral organ of smell. It is the most protruding part of the face. It includes external nose and nasal cavity which is divided into left and right cavities by the nasal septum.

The nasal cavities have a roof, floor, medial and lateral walls. The nasal cavity is the uppermost part of the

respiratory system and provides the nasal passage for inhaled air from nostrils to the nasopharynx and rest of the respiratory tract. The walls of the nose are medial wall and lateral wall of nasal cavity.

The lateral wall of nasal cavity consists mainly of the maxilla. There is a deficiency that is compensated for by the perpendicular plate of palatine bone, medial pterygoid plate the labyrinth of ethmoid and the inferior concha. The lateral wall is irregular due to these bony plates, the nasal conchae, which project inferiorly somewhat like leaves. The nasal conchae (superior, middle and inferior) curve inferomedially from the lateral wall and are highly convoluted scroll-like structures that offer a vast surface area for heat exchange.



The medial wall of the nasal cavity is formed by the nasal septum. It divides the two nostrils and nasal cavities. The fleshy external end of the nasal septum is the columella or Columella nasi. The nasal septum contains hyaline cartilage and bones. It is normally 2mm thick and is composed of perpendicular plate of ethmoid bone, vomer bone, septal nasal cartilage and maxillary crest (strip of narrow bone that projects from maxilla and palatine bones and is the lowest part and length of the septum).

Clinical Anatomy

- i) Deviated septum: This is caused by trauma to the nose and the nasal septum departs from the central line of the nose.
- ii) Perforated nasal septum: caused by ulcer or trauma due to an inserted object, cocaine use or long term exposure to welding fumes.
- iii) Sinusitis: A condition where the cavities and walls of nose are inflamed due to cold or allergies.