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1. Write an essay on the cavernous sinus

The cavernous sinus is a paired dural venous sinus located within the cranial cavity. It is divided by septa into small-caves- from which it gets its name. Each cavernous sinus has a close anatomical relationship with several key structures in the head, and is arguably the most clinically important venous sinus.

Anatomical Location and Borders

The cavernous sinuses are located within the middle cranial fossa , on either side of the sella turcica of the sphenoid bone( which contains the pituitary gland). They are enclosed by the endosteal and meningeal layers of the dura mater. The borders of the cavernous sinus are as follows:

Anterior- superior orbital fissure

Posterior-petrous part of the temporal bone

Medial-body of the sphenoid bone

Lateral- meningeal layer of the dura mater running from the roof to the floor of the middle cranial fossa.

Roof- meningeal layer of the dura mater that attaches to the anterior and middle clinoid processes of the sphenoid bone.

CONTENTS : Several structures pass through the cavernous sinus to enter the orbit. This can be sub-classified by the whether they travel through the sinus itself, or through its lateral wall:

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| Travels through carvenous sinus: | Travels through lateral wall of cavernous sinus: |
| * Abducens nerve(CNVI) | * Oculomotor nerve (CNIII) |
| * Carotid plexus (post – ganglionic sympathetic) | * Trochlear nerve ( CNIV) |
| * Internal carotid artery (cavernous portion) | * Opthalamic (V1) and maxillary (V2) branches of the trigeminal nerve |

The carvenous sinus is the only site in the body where an artery (internal carotid) passes completely through a venous structure . This is thought to allow for heat exchange between the warm arterial blood and cooler venous circulation.

DURAL VENOUS SINUS SYSTEM

Each carvenous sinus receives venous drainage from :

* Opthalmic veins : ( superior and inferior ) these enter the carvenous sinus via the superior orbital fissure.
* Central vein of the retina – drains into the superior ophthalmic vein, or directly into the carvenous sinus.
* Sphenoparietal sinus- empties into the anterior aspect of the carvenous sinus.
* Superficial middle cerebral vein- contributes to the venous drainage of the cerebrum
* Pterygoid plexus- located within the infratemporal fossa.

The cavernous sinuses empty into the superior and inferior petrosal sinuses, and ultimately, into the internal jugular vein. The left and right carvenous sinuses are connected in the midline by the anterior and posterior intercarvenous sinuses. They travel through the sella turcica of the sphenoid bone.

1. The walls of the nose

The nose is an olfactory and respiratory organ. It consists of nasal skeleton, which houses the nasal cavity. The nasal cavity has four functions : warms and humidifies the inspired air, removes the traps pathogens and particulate matter from the inspired air . Responsible for the sense of smell. Drains and clears the paranasal sinuses and lacrimal ducts . The nasal cavity is divided into two cavities by the nasal septum, and each is accessed by an external nostril. At the back of the nasal cavity there are two openings called choanae ( posterior nostrils ) that give entrance to the nasaopharynx and the rest of the respiratory tract. On the outer wall of each cavity are three shell- like bones called conchae , arranged as superior, middle and inferior nasal conchae . Sometimes when the superior concha is narrow , a fourth supreme nasal concha is present situated above and sharing the space with the superior concha. The term concha refers to the actual bone; when covered by soft tissue and mucosa , and functioning , a concha is termed a turbinate. In the roof of each cavity is an area of specialized olfactory epithelium. There is nasal valve that is the narrowest part of the nasal passage. An external valve exists in the large ala part of the vestibule. An internal nasal valve typically referred to as the nasal valve, is a slit-like segment between part of the upper lateral cartilage and the septum in the middle third of the cavity. The valves regulate the airflow and resistance . Air breathed in is forced to pass through the narrow internal nasal valve, and then expands as it moves into the nasal cavity. The borders of each nasal cavity are a roof , floor, medial wall(the septum) and lateral wall. The middle part of the roof of the nasal cavity is composed of the horizontal, perforated cribiform plate of the ethmoid bone, through which pass sensory fibres of the olfactory nerve into the cranial cavity.