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1. Write an essay on the carvanous sinus
2. Discuss the walls of the nose.

Answers

1. **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
    - **Complications**:
      * Septic thrombosis of this area can also cause acute meningitis.
      * Fairly rapid changes in mental status (confusion and fatigue)
      * Death
    - **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 (note: limited data but may be  helpful

## **2.** The nasal cavity

The nares serve as the entryway to the nasal cavities, which open posteriorly into the nasopharynx via the choanae. The walls of the nasal cavity include the following features:

* **Roof:** The roof is divided into three parts: frontonasal, ethmoidal, and sphenoidal. Each part corresponds to the underlying bone of the same name.
* **Floor:** The floor consists of the palatine process of the maxilla and the horizontal plate of the palatine bone.
* **Medial wall:** This wall is the nasal septum, which is formed by the perpendicular plate of the ethmoid bone, the vomer, cartilage, and the nasal crests of the maxillary and palatine bones.
* **Lateral wall:** This wall is hallmarked by three nasal conchae (superior, middle, and inferior) that project inferiorly from the wall. They divide the nasal cavity into four passages that have openings to the paranasal sinuses:
* The sphenoethmoid recess lies posterior to the superior concha and has the opening for the sphenoidal sinus.
* The superior nasal meatus lies between the superior and middle conchae and has openings to the posterior ethmoidal sinuses.
  + The middle nasal meatus is longer and deeper than the superior nasal meatus. The frontal sinus communicates with the middle nasal meatus via the infundibulum, a passageway that opens into the semilunar hiatus (groove in the ethmoid bone). The maxillary sinus opens into the semilunar hiatus. An ethmoidal bulla (a round swelling formed by the middle ethmoidal cells, or air-filled cavities) is formed just above the semilunar hiatus. The middle and anterior ethmoidal sinuses drain into the middle nasal meatus.
  + The inferior nasal meatus is found below the inferior nasal concha. The nasolacrimal duct opens into this meatus.

The nasal cavity is lined with nasal mucosa, except for the nasal vestibule, which is lined with skin. The mucosa over the superior one-third of the nasal cavity is the olfactory area. Air is drawn past the specialized mucosal cells called the olfactory epithelium as air is sniffed though the nose. The olfactory epithelium contains receptors of olfactory neurons that detect smells. Olfactory neurons (from CN I) join together to form nerve bundles that run up through the cribiform plate of the ethmoid bone to the olfactory bulb.