

NAME: FADIPE NAOMI INEMESIT

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COURSE TITLE: GROSS ANATOMY OF HEAD AND NECK

COURSE CODE: ANA 301

LECTURER: DR OGEDENGBE

QUESTION 1: Write an essay on the cavernous sinus.

ANSWER: The cavernous sinus is a large venous plexus which is located on each side of the sella turcica on the upper surface of the body of the sphenoid, which contains the sphenoid (air) sinus. The cavernous sinus is located at the region of the middle cranial fossa. The cavernous sinus 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. It receives blood from the superior and inferior ophthalmic veins, superficial middle cerebral vein, emissary vein and sphenoparietal sinus. The venous channels in these sinuses communicate with each other through veins inferior to the pituitary gland. The cavernous sinuses drain through posteroventral channels anterior and posterior to the stalk of the pituitary gland—the intercavernous sinuses –and sometimes, inferiorly through the superior and inferior petrosal sinuses and emissary veins to the basilar and pterygoid plexuses. This means that the right and left wall of cavernous sinus are joined together anteriorly and posteriorly by INTERCAVERNOUS SINUS. Inside each cavernous sinus is the internal carotid artery with its small branches, surrounded by the carotid plexus of sympathetic nerve(s) mainly the internal carotid artery, and the abducent nerve (CN VI). The oculomotor (CNIII) and trochlear (CNIV) nerves, plus two of the three divisions of the trigeminal nerve (CNV) which are the ophthalmic and maxillary division of trigeminal nerve are embedded in the lateral wall of the sinus. The artery, carrying warm blood from the body's core, traverses the sinus filled with cooler blood returning from the capillaries of the body's periphery, allowing for heat exchange to conserve energy or cool the arterial blood. This does not appear to be as important in humans as it is in running animals (e.g., horses and cheetahs) in which the carotid artery runs a longer, more tortuous course through the cavernous sinuses, allowing cooling of blood before it enters the brain. Pulsations of the artery within the cavernous sinus are said to promote propulsion of venous blood from the sinus, as does gravity.

N.B.: The superior petrosal sinuses run from the posterior ends of the veins making up the cavernous sinus to the transverse sinuses at the site where these sinuses curve inferiorly to form the sigmoid sinuses. The inferior petrosal sinuses also commence at the posterior end of the cavernous sinus. The sphenoparietal sinus will drain into the anterior end of cavernous sinus.

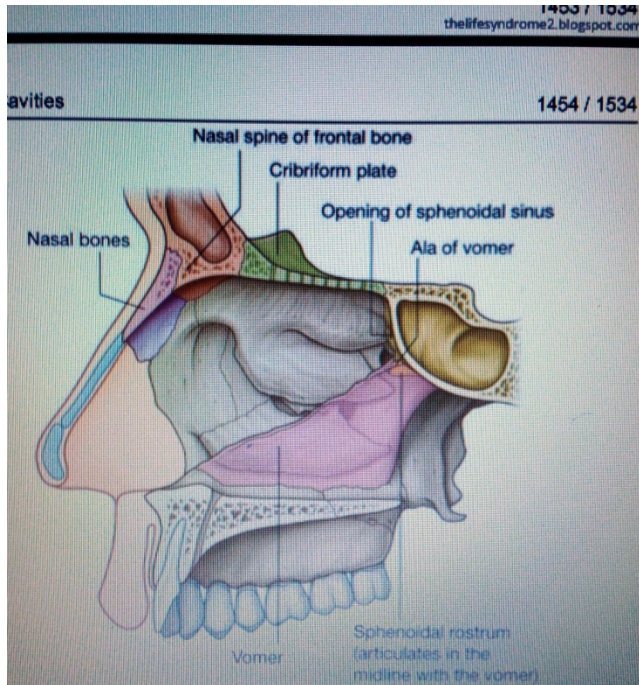
QUESTION 2: Discuss the walls of the nose.

ANSWER: The nose has two nasal cavities. The two nasal cavities are the uppermost parts of the respiratory tract. They are elongated wedge-shaped spaces with a large inferior base and a narrow superior apex and are held open by a skeletal framework consisting mainly of bone and cartilage. The smaller anterior regions of the cavities are enclosed by the external nose, whereas the larger posterior regions are more central within the skull. The anterior apertures of the nasal cavities are the nares, which open onto the inferior surface of the nose. The posterior apertures are the choanae, which open into the nasopharynx. Lateral to the nasal cavities are the orbits. The nasal cavities have four walls which are the roof, floor, medial and lateral wall.

- The roof of the nasal cavities is curved and narrow, except at its posterior end, where the hollow body of the sphenoid forms the roof. It is divided into three parts (frontonasal, ethmoidal, and sphenoidal) named from the bones forming each part. The roof of the nasal cavity is narrow and is highest in central regions where it is formed by the cribriform plate of the ethmoid bone. Anterior to the cribriform plate the roof slopes inferiorly to the nares and is formed by: the nasal spine of the frontal bone and the nasal bones; and the lateral processes of the septal cartilage and major alar cartilages of the external nose.

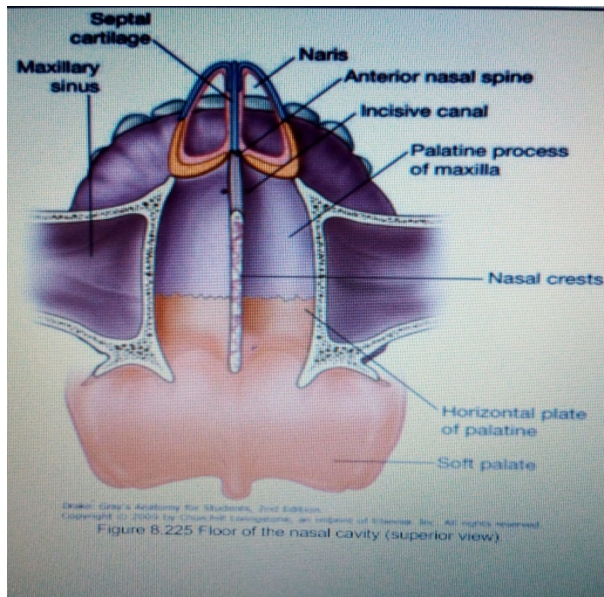
Posteriorly, the roof of each cavity slopes inferiorly to the choana and is formed by: the anterior surface of the sphenoid bone; the ala of the vomer and adjacent sphenoidal process of the palatine bone; and the vaginal process of the medial plate of the pterygoid process.

Underlying the mucosa, the roof is perforated superiorly by openings in the cribriform plate, and anterior to these openings by a separate foramen for the anterior ethmoidal nerve and vessels. The opening between the sphenoidal sinus and the sphenoidal recess is on the posterior slope of the roof.

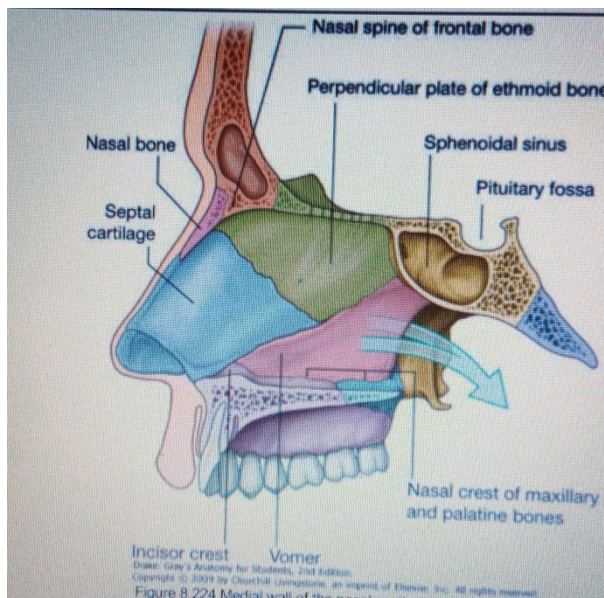


- The floor of the nasal cavities is smooth, concave and much wider than the roof and is formed by the palatine processes of the maxilla and the horizontal plates of the palatine bone. It consists of: soft tissues of the external nose and the upper surface of the palatine process of the maxilla, and the horizontal plate of the palatine bone, which together form the hard palate.

The naris opens anteriorly into the floor, and the superior aperture of the incisive canal is deep to the mucosa immediately lateral to the nasal septum near the front of the hard palate.



- The medial wall of the nasal cavities is formed by the nasal septum. The medial wall of each nasal cavity is the mucosa-covered surface of the thin nasal septum, which is oriented vertically in the median sagittal plane and separates the right and left nasal cavities from each other. The nasal septum consists of: the septal nasal cartilage anteriorly; posteriorly, mainly the vomer and the perpendicular plate of the ethmoid bone; small contributions by the nasal bones where they meet in the midline, and the nasal spine of the frontal bone; and contributions by the nasal crests of the maxillary and palatine bones, rostrum of the sphenoid bone, and the incisor crest of the maxilla. The diagram below shows the medial wall of nasal cavity.



- The lateral walls of the nasal cavities are irregular owing to three bony plates, the nasal conchae, which project inferiorly, somewhat like louvers. The lateral wall of each nasal cavity is complex and is formed by bone, cartilage, and soft tissues. Bony support for the lateral wall is provided by: the ethmoidal labyrinth and uncinete process; the perpendicular plate of the palatine bone; the medial plate of the pterygoid process of the sphenoid bone; the medial surfaces of the lacrimal bones and maxillae; and the inferior concha. The surface of lateral wall is rough and it is interrupted by three nasal conchae.

