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FEATURES OF NASAL CAVITYANATOMY ITSELF

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Annotation: The nasal cavity is the most cephalic part of the respiratory tract. It communicates with the external environment via the anterior apertures, nares, and the nasopharynx via the posterior apertures, choanae. This cavity is divided into two separate cavities by the septum and kept patent by a bone and cartilaginous framework. Each cavity consists of a roof, floor, medial wall, and lateral wall. Within each cavity are three regions; nasal vestibule, respiratory region, and olfactory region.

Key words: nose. blood, nasal septum.

Surrounding the nasal cavities are air-containing mucosal lined sinuses, which include the frontal sinuses (superior anterior), ethmoid sinuses (superior), paired maxillary sinuses (lateral), and sphenoid sinuses (posterior). All of these paranasal sinuses, except the sphenoid, communicate with the nasal cavity via ducts that drain through ostia, which empty into spaces located on the lateral wall. The sphenoid sinus empties into the posterior roof. Having a fundamental knowledge of the anatomy of the nasal cavity is vital in understanding its functions.

Respiratory Region

The respiratory region functions to humidify, warm, filter, protect, and eliminate debris. Covered in respiratory epithelium and mucous cells, this is the most substantial part of the nasal cavity. As air traverses through the nasal cavity, it warms to body temperature and reaches near one hundred percent humidity. The neurovascular supply of this region aids this. It regulates the nasal airflow by controlling the blood volume in the erectile tissue on the inferior turbinate and anterior septum. Under normal conditions, this tissue is continuously stimulated by sympathetic signals via the superior cervical ganglia to keep the nasal cavity uncongested.

Particles that get past the nasal vestibule then become trapped in the mucosa of the nasal cavity. When this occurs, the mucociliary system helps get rid of these particles. The ciliated pseudostratified columnar epithelium sweeps particles at a rate of one centimeter per minute into the nasopharynx for further expulsion.

The mucus of the nasal cavity forms a protective barrier to inhaled pathogens. The components of the mucus that actively protect the host are immunoglobulin A, lysozymes, and lactoferrin

Olfactory Region

Olfaction requires orthonasal or retronasal airflow to transport odor-bearing particles up to the olfactory epithelium located at the apex of the nasal cavity. As odorants become trapped in the mucus, it binds to odorant binding proteins that concentrate and help solubilize the particles. The particles are then attached to olfactory receptors on cilia that transmit specific signals up through the cribriform plate to synapse with neurons of the olfactory bulb, which then sends signals through the olfactory nerve (CNI) into the secondary neurons for higher processing before entering the brain. A unique feature of the olfactory receptors is that a single receptor cell can detect only one odorant type and cannot regenerate.

Nasal Vestibule

The nasal vestibule is the first area encountered as you move posteriorly through the anterior nares, also known as the nostrils or external nasal valve. The first half of the vestibule has a covering of keratinized stratified squamous epithelium that contains coarse hairs called vibrissae. These hairs filter inhaled particles. The covering of the second half of the vestibule is in respiratory epithelium, pseudostratified ciliated columnar epithelium.

- Lateral: lateral crus of the lower lateral cartilage (LLC) and fibrofatty alar tissue
- Medial: medial crus of the LLC and septal cartilage
- Posterior: limen naris

The roof of the Nasal Cavity

The mucosa of the roof of the nasal cavity contains perforations that communicate with the cribriform plate. Within these perforations are the olfactory axons.

- Anterior: nasal spine of the frontal bone and nasal bone
- Posterior: cribriform plate of the ethmoid and the body of the sphenoid

The floor of the Nasal Cavity

The floor of the nasal cavity is broader than that of the roof.

- Anterior: the palatine process of the maxilla
- Posterior: horizontal plate of the palatine bone

Incisive Canal

This canal is located in the floor of the nasal cavity, posterior to the central incisor, and lateral to the nasal septum. This structure transmits the nasopalatine nerve into the oral cavity and the greater palatine artery into the nasal cavity.

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 (see blood supply).

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.

Nasal Crest of the Maxilla and Palatine Bone: Together these bones form the inferior support for the septal cartilage.

Anterior Nasal Spine of the Maxilla: This is a bony projection formed by the paired maxillary bones. It located anterior to the piriform aperture and are palpable at the superior portion of the philtrum of the upper lip.

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.

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.

Limen Naris: The limen naris is a mucosal ridge that signifies the posterior boundary of the nasal vestibule and the anterior boundary of the nasal cavity proper.

Agger Nasi Cells: These cells are the most anterior portion of the anterior ethmoid air cells. They are located anterior and superior to the basal lamella, most anterior attachment to the lateral wall, of the middle turbinate to create the anterior aspect of the frontal recess.

Frontal Recess: Located between the posterior wall of the agger nasi cells and the middle turbinate.

Uncinate Process of the Ethmoid: This is a thin crescent-shaped bone that is part of the ethmoid bone. It is attached to the lacrimal bone anteriorly, the inferior turbinate inferiorly and superiorly to the lamina papyracea. This structure protects the sinuses of the infundibulum from inhaled foreign particles.

Lamina Papyracea: This thin bone is the separation between the orbit and the ethmoid air cells.

Ethmoid Infundibulum: This is a pyramidal shaped channel located at the anterior portion of the semilunar hiatus that drains the maxillary, anterior ethmoid, and frontal sinuses.

Semilunar Hiatus: Located between the uncinate process anteriorly and the ethmoid bulla posteriorly, this is a space that empties the ethmoid infundibulum.

Ethmoid Bulla: Located just anterior to the semilunar hiatus and superior to the ethmoid infundibulum, which is where the middle ethmoidal air cells open into the nasal cavity.

Ostiomeatal Complex (OMC): This is an area located lateral to the middle turbinate that houses the ostia of the lateral wall sinuses; frontal, maxillary, and anterior/middle ethmoid sinuses.

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

Choanae

The choanae are also known as posterior nasal apertures. It is the posterior boundary of the nasal cavity proper. It opens into the nasopharynx.

- Superior: the body of the sphenoid bone
- Inferior: horizontal plate of the palatine bone
- Lateral: the medial pterygoid process of the sphenoid bone
- Medial: vomer

Internal Nasal Valve (INV)

The INV is the narrowest portion of the nasal cavity and constitutes the area of highest resistance to airflow, which causes an increase in the acceleration of airflow. Without proper support, this increased airflow causes a decrease in intraluminal pressure, which ultimately causes the INV to collapse; this is Bernoulli's principle of flow. The average cross-sectional area of the INV in

adults is around 0.73 square centimeters. At the apex of the valve the ULC and, the nasal septum come together at an angle of 10 to 15 degrees.

Literature:

1. Salomov, S., Aliyev, H. M., & Rakhmanov, R. R. (2022). MORPHOMETRIC INDICATORS OF THE GROWTH OF THE THICKNESS OF THE LAYERS OF THE VISUAL CORTEX (FIELD 17, 18, and 19) OF THE LEFT AND RIGHT HEMISPHERES OF THE BRAIN IN A HUMAN IN POST-NATAL ONTOGENESIS. *Galaxy International Interdisciplinary Research Journal*, *10*(1), 875-878.
2. Izbosarovna, O. M. (2022). FLOWERING PLANTS USED IN LANDSCAPING WORK. *British Journal of Global Ecology and Sustainable Development*, *10*, 184-190.
3. Izbosarovna, O. M. (2022). CARE AND FEEDING OF CARP FISH. *British Journal of Global Ecology and Sustainable Development*, *10*, 108-113.
4. Ачилова, З. (2023). Словообразовательные и грамматические трудности при переводе испанского текста на русский. *Центральноазиатский журнал образования и инноваций*, *2*(6 Part 6), 220-224.
5. Ачилова, З. П. МЕТОДЫ ОБУЧЕНИЯ ПРИ ПЕРЕВОДЕ ПОЛИТИЧЕСКИХ ВЫСТУПЛЕНИЙ Эргашев Алишер Фарход угли.
6. Nozimjon o‘g, S. S., & Mahramovich, K. S. (2024). The Chemical Composition Of The White Carrak Plant And Its Medicinal Role. *Texas Journal of Medical Science*, *29*, 78-80.
7. АЧИЛОВА, З. LAS PARTICULARIDADES DE LA COMPETENCIA COMUNICATIVA DE LOS ESTUDIANTES.
8. Nozimjon o’g’li, S. S., & Makhmudovich, A. H. (2024). The Most Effective Drugs in the Treatment of Myocarditis Disease. *Health & Medical Sciences*, *1*(2), 6-6.