NASAL CAVITY AND PARANASAL SINUSES

P. Mazengenya

2B04
OBJECTIVES

• Outline the structures that form the nasal region
• Describe the gross structure of the external nose
• Describe the nasal septum
• Define the boundaries of the nasal cavity
• Describe the blood supply, venous and lymphatic drainage of nasal cavity
• Describe the paranasal sinuses and their relationship to the nasal cavity
NOSE

• Organ of smell
• Part of the respiratory system
• **Functions include:**
  - Olfaction
  - Respiration
  - Filtration
  - Humidification
  - Conduit
EXTERNAL NOSE

- Consists:
  - Bone
  - Cartilage
- Root
- Apex
  - Openings called the **nares/nostrils**
- Alar of the nose
- Nasal septum
- Vestibule- vibrissae
ROOT OF THE NOSE

• Bones
  ✓ Paired nasal bones
  ✓ Frontal processes of the maxilla
  ✓ Frontal bone (nasal part)
MUSCLES OF THE EXTERNAL NOSE

• Nasalis
  o Dilator naris
  o Compressor naris

❖ Dilate and flatten the naris
VASCULATURE & INNERVATION

• Vasculature
  o Ophthalmic artery
  o Facial artery
    ▪ Corresponding veins

• Innervation
  o Trigeminal via V1 and V2
NASAL SEPTUM

• Composed:
  o bone- posterior ⅔
  o cartilage- anterior ⅓
• Divides the nasal cavity
• Bones
  o Perpendicular plate of ethmoid
  o vomer
• Cartilage
  o Septal cartilage
NASAL CAVITY

• Extend from nares to choanae
  o Nares – external opening
  o Choana- opening into pharynx

• Vestibule
  o Skin and hairs
  o Skin mucosal junction (limeni nasi)
NASAL CAVITY

• Nasal mucosa
  o Superior ⅓ olfactory
  o Inferior ⅔ respiratory

  ▪ The later extends into all chambers, cavities and sinuses communicating with nasal cavities
NASAL CAVITY

- **Boundaries**
  - **roof** – frontonasal, cribiform plate, sphenoid bone
  - **Floor** – palatine process of the maxilla, horizontal plate of palatine bone
  - **Medial wall** – nasal septum
  - **Lateral wall** – maxilla, lacrimal, ethmoid, inferior nasal concha
NASAL CONCHAE

- Horizontal projections from the lateral wall
  - Superior concha (ethmoid)
  - Middle concha (ethmoid)
  - Inferior concha (maxilla)
• Divide lateral wall of nasal cavity into:
  o Sphenoethmoidal recess
  o Superior meatus
  o Middle meatus
  o Inferior meatus
NASAL PASSAGES

• **Sphenoethmoidal recess** -
  - lies superoposterior to superior concha
  - Receives opening from sphenoid sinus
NASAL PASSAGES

- **Superior meatus**
  - Between superior and middle conchae
  - Opening for posterior ethmoidal sinuses

- **Middle meatus**
  - Wider than superior
  - *Bulla ethmoidalis*-middle ethmoidal cells-sinus
• **Middle meatus receives**
  - Anterior ethmoidal sinus
  - Frontal sinus
  - Maxillary sinus
• **Inferior meatus**
  - Below the inferior concha
  - Drains tears through *nasolacrimal duct*
BLOOD SUPPLY

• Arteries
  o Maxillary a:
    ✓ Sphenopalatine a
    ✓ Greater palatine a
  o Ophthalmic a –
    ✓ Anterior and posterior ethmoidal arteries
  o Facial a-
    ✓ Superior labial & lateral nasal branches of facial artery

• Veins
  o Sphenopalatine veins
  o Facial veins
  o Ophthalmic veins
INNERVATION

• Nerves
  o Maxillary nerve branches
    ✓ Nasopalatine
    ✓ Lateral palatine nerve
  o Ophthalmic nerve-
    ✓ Nasociliary branch
      ➢ Ant & post ethmoidal nerve

• Lymph
  o retropharyngeal nodes
  o Anterior nasal cavity to submandibular nodes
PARANASAL SINUSES

• Extensions of nasal cavity into
  o maxillary
  o ethmoid
  o frontal
  o sphenoid bones
• Lined with respiratory epithelium
• Present at birth
• Air filled
• **Functions:**
  - Humidification of air
  - Regulation of intranasal pressure
  - Immune defence
    - Increase of the mucosal surface area
  - Lightening of the skull
  - Voice resonance
  - Shock absorber
  - Facial growth
PARANASAL SINUSES

• **Frontal sinus**
  - Lies in the frontal bone
  - Detectable at age of 7
  - Drains to the middle meatus
  - **Supraorbital nerve**
• Ethmoidal sinuses
  o Several in number
  o Anterior group drains - infundibulum ➝ middle meatus
  o Middle cells - ethmoid bulla
  o Posterior cells - superior meatus
• Drainage
• **Sphenoidal sinuses**
  - Found in the sphenoid bone
  - Numbers vary on either side
  - Drains through **Sphenoethmoidal recess**
- Maxillary sinuses
  - largest and pyramidal
  - Occupies the body of the maxilla
  - Drains into middle meatus
SUMMARY

• The nose has olfactory and respiratory mucosa
• Understand its blood supply & innervation
• Nose bleeding
• Sinusitis & drainage of sinus
Thank you