

NASAL CAVITY

LATERAL WALL OF NASAL CAVITY (LE)

The nasal cavity is divided by the nasal septum into right and left nasal cavities. Each nasal cavity is bounded by medial wall (nasal septum), lateral wall, floor and roof.

Features on the lateral wall of nose:

From anterior to posterior-

Vestibule- anterior part lined by skin

Atrium- depressed region above the vestibule

Conchae- (turbinates) three in number, lie in the posterior part.

Meatuses- they are spaces below the conchae and also three in number

Mucous membrane of lateral wall of nose:

Vestibule- lined by skin

Major part - lined by pseudostratified ciliated columnar epithelium

Roof-lined by olfactory epithelium

Conchae

These are the curved plates of bone seen on the lateral wall of nose.

- Superior concha (Part of ethmoid bone)
- Middle concha (Part of ethmoid bone)
- Inferior concha. (Individual skull bone)

Meatuses

There are three meatuses

- Superior meatus
- Middle meatus
- Inferior meatus

The space above the superior concha is known as sphenoethmoidal recess (supreme meatus).

Openings in meatuses

Superior meatus

Posterior ethmoidal sinus opens into it.

Middle meatus- four sinuses open into it

Middle ethmoidal sinus.

Forms a rounded elevation called the ethmoidal bulla produced by the underlying middle ethmoidal sinus.

Frontal air sinus

Anterior ethmoidal air sinus

Maxillary air sinus.

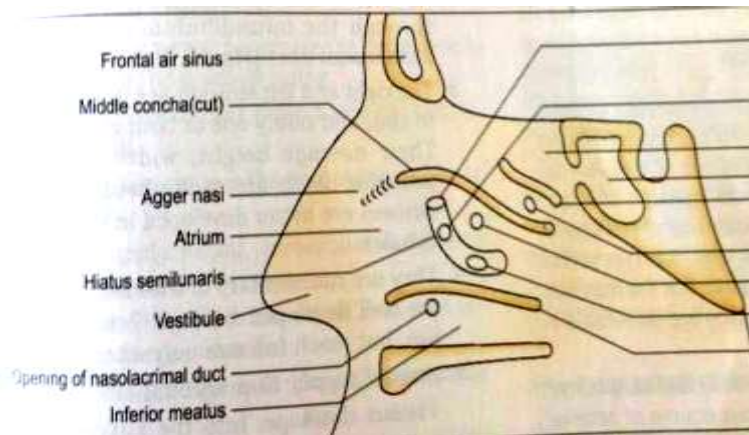
All the above mentioned sinuses open into a deep curved groove known as hiatus semilunaris which lies below the ethmoidal bulla

Inferior meatus

Naso lacrimal duct opens into it.

Spheno-ethmoidal recess (Supreme meatus)

Sphenoidal air sinus opens into it



Blood supply of lateral nasal wall:

Arterial supply:

Anterosuperior quadrant:

Anterior ethmoidal artery

Posterior ethmoidal artery

Alar branch of Facial artery

Anteroinferior quadrant:

Facial artery

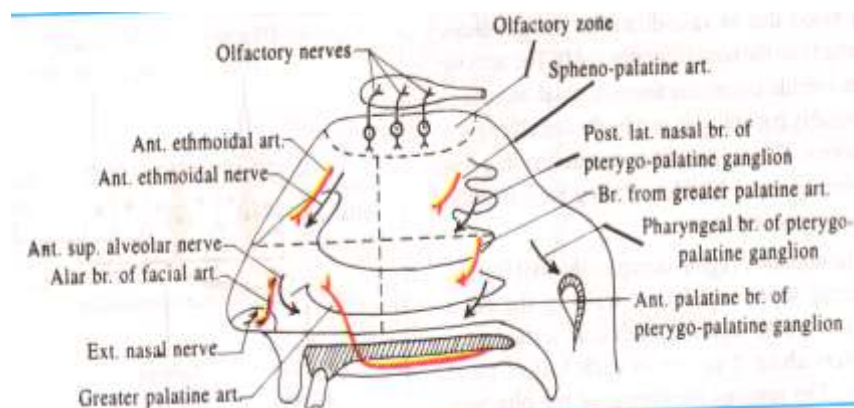
Greater palatine artery

Posterosuperior quadrant:

sphenopalatine artery

Posteroinferior quadrant:

Greater palatine artery



Venous drainage:

Anteriorly into facial vein

Posteriorly into pharyngeal plexus of veins

Middle part into pterygoid plexus of veins.

Lymphatic drainage:

Anterior half- submandibular nodes

Posterior half- retropharyngeal nodes and upper deep cervical nodes.

Nerve supply:

I. General sensation:

Anterosuperior quadrant :

Anterior ethmoidal nerve (branch of ophthalmic nerve)

Anteroinferior quadrant:

Anterior superior alveolar nerve (branch of maxillary nerve

Posterosuperior quadrant:

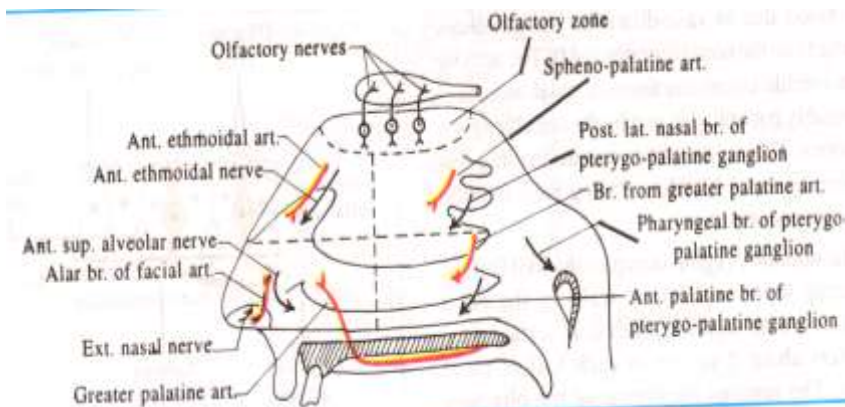
Posterior superior lateral nasal branches (branch of pterygopalatine ganglion)

Posteroinferior quadrant:

Greater palatine nerve (branch of pterygopalatine ganglion)

II. Special sensation (olfactory)

Upper part of lateral wall upto superior meatus - olfactory nerves.



LATERAL WALL OF NOSE (SE)

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Roof-lined by olfactory epithelium

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Forms a rounded elevation called the ethmoidal bulla produced by the underlying middle ethmoidal sinus.

Frontal air sinus

Anterior ethmoidal air sinus

Maxillary air sinus.

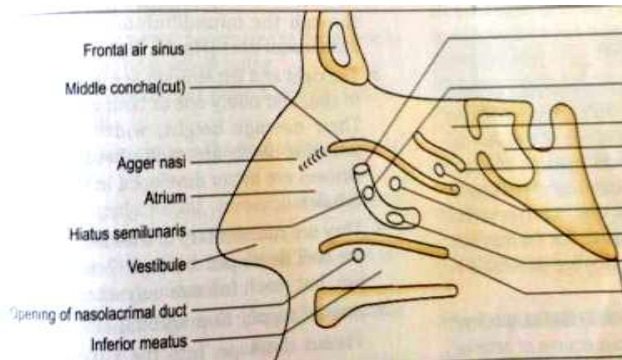
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Sphenoidal air sinus opens into it



Blood supply of lateral nasal wall:

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Anterosuperior quadrant:

Anterior ethmoidal artery

Posterior ethmoidal artery

Alar branch of Facial artery

Anteroinferior quadrant:

Facial artery

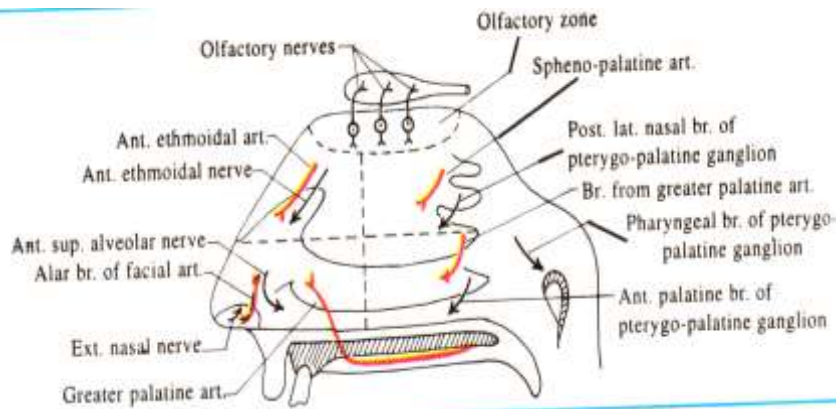
Greater palatine artery

Posterosuperior quadrant:

sphenopalatine artery

Posteroinferior quadrant:

Greater palatine artery



Venous drainage:

- Anteriorly into facial vein
- Posteriorly into pharyngeal plexus of veins
- Middle part into pterygoid plexus of veins.

Lymphatic drainage:

- Anterior half- submandibular nodes
- Posterior half- retropharyngeal nodes and upper deep cervical nodes.

Nerve supply:

I. General sensation:

Anterosuperior quadrant :

- Anterior ethmoidal nerve (branch of ophthalmic nerve)

Anteroinferior quadrant:

- Anterior superior alveolar nerve (branch of maxillary nerve)

Posterosuperior quadrant:

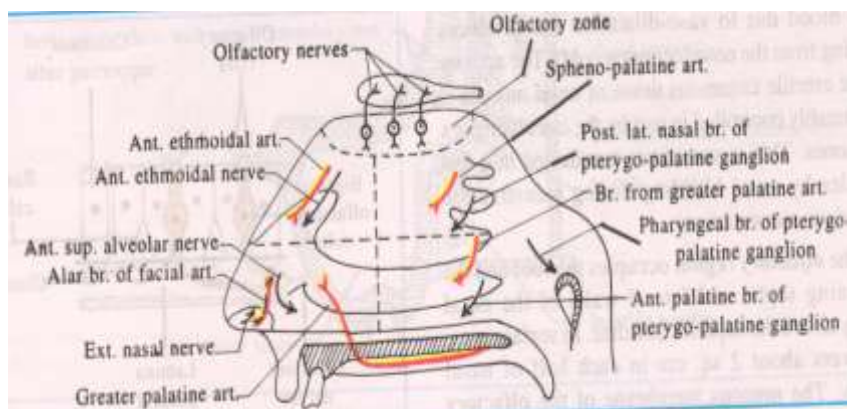
- Posterior superior lateral nasal branches (branch of pterygopalatine ganglion)

Posteriorinferior quadrant:

- Greater palatine nerve (branch of pterygopalatine ganglion)

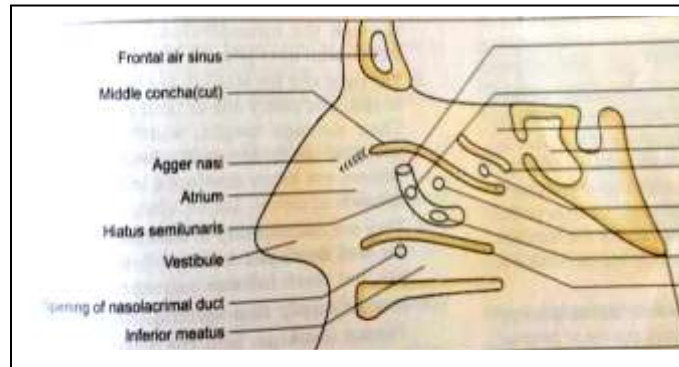
II. Special sensation (olfactory)

- Upper part of lateral wall upto superior meatus - olfactory nerves.



Middle meatus of nose.(SE)

Middle meatus is the space under cover of Middle concha of nose.



Features seen:

Ethmoidal bulla (Bulla ethmoidalis)- rounded elevation

Produced by underlying Middle ethmoidal air sinuses.

Hiatus semilunaris - deep semicircular sulcus, present below the ethmoidal bulla.

Structures opening in the Middle meatus:

Anterior ethmoidal air sinus

Middle ethmoidal air sinus opens on to bulla ethmoidalis

Frontal air sinus

Maxillary air sinus

MIDDLE MEATUS OF NOSE (SA)

Middle meatus is the space under cover of Middle concha of nose.

Features seen:

Ethmoidal bulla (Bulla ethmoidalis)

Hiatus semilunaris

Structures opening in the Middle meatus:

Structures opening onto the ethmoidal bulla:

Middle ethmoidal air sinus

Structures opening in to the hiatus semilunaris:

Frontal air sinus

Anterior ethmoidal air sinus

Maxillary air sinus

PARANASAL AIR SINUSES

CLASSIFY PARANASAL AIR SINUSES. ADD A NOTE ON MAXILLARY AIR SINUS (LE)

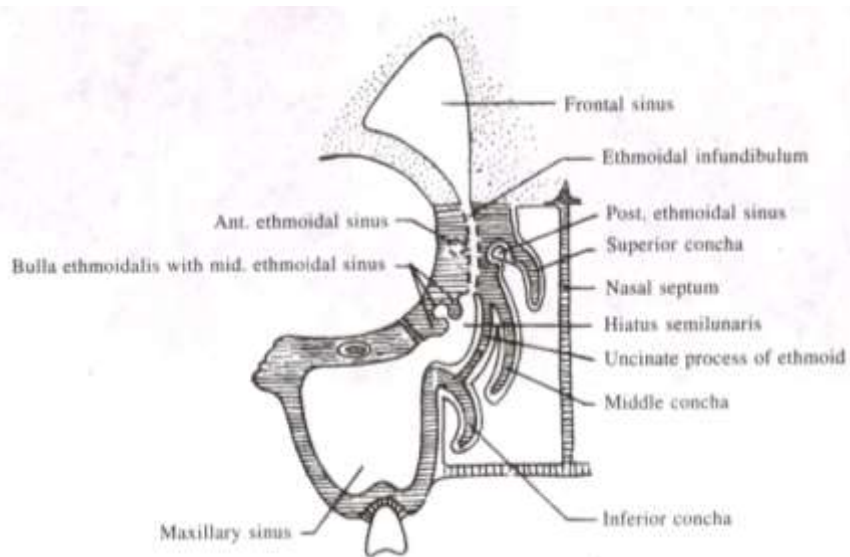
Paranasal air sinuses are clinically classified into anterior and posterior sinuses.

Anterior: (opening into middle meatus):

maxillary, frontal, anterior and middle ethmoidal air sinuses

Posterior: (opening into other meatuses):

posterior ethmoidal (opens into superior meatus), sphenoidal (opens into sphenoethmoidal recess)



Maxillary air sinus:

It is the largest air sinus and lies in the body of the maxilla.

It is the first paranasal air sinus to develop in the 4th month of intrauterine life

It is Pyramidal in shape, having apex, base, roof, floor, anterior and posterior wall

Apex:

Directed laterally towards zygomatic bone

Base:

Directed medially, formed by lateral wall of nose.

There is a large opening called hiatus, which is close to the roof.

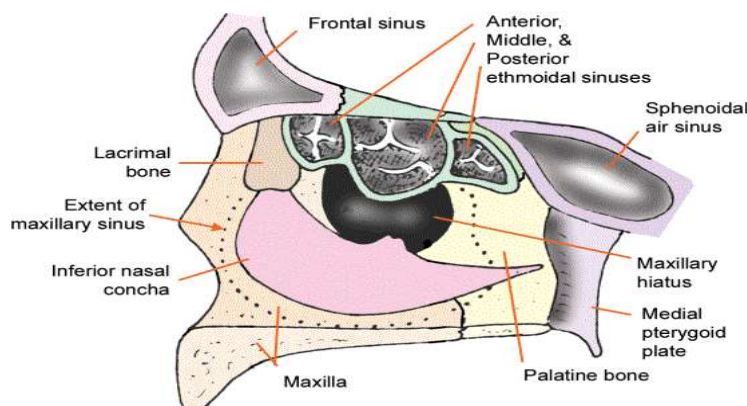
In the intact skull the large hiatus is made smaller by overlapping of four bones-

Uncinate process of ethmoid from above,

Descending part of lacrimal bone anteriorly,

Inferior nasal concha from below and

Perpendicular plate of palatine bone posteriorly.



Roof:

Formed by floor of orbit, related to infraorbital vessels and nerve

Floor:

Formed by the alveolar process of maxilla, lies below the level of floor of nasal cavity, related to upper molar and premolars

Anterior wall:

Anterior wall of maxilla, related to infra-orbital plexus of nerves,
anterior superior alveolar nerve

Posterior wall:

Formed by infratemporal surface of maxilla, related to posterior
superior alveolar vessels and nerves

Arterial supply:

Branches of Facial, infra orbital, greater palatine arteries

Venous drainage:

Facial vein, pterygoid venous plexus

Lymphatic drainage:

submandibular lymph nodes

Nerve supply:

Infra orbital, anterior, middle and posterior superior alveolar nerves

Applied aspects:

Maxillary sinusitis:

Maxillary sinus opening lies much above the floor so, natural drainage is poor. As a result it acts as a secondary reservoir of pus.

The pus could be from Infection of frontal or ethmoidal air sinuses through hiatus semilunaris.

As the floor is closely related to premolars and molars, Caries of these teeth can also result in maxillary sinusitis.

Carcinoma of maxillary sinus will lead to different symptoms depending on the spread.

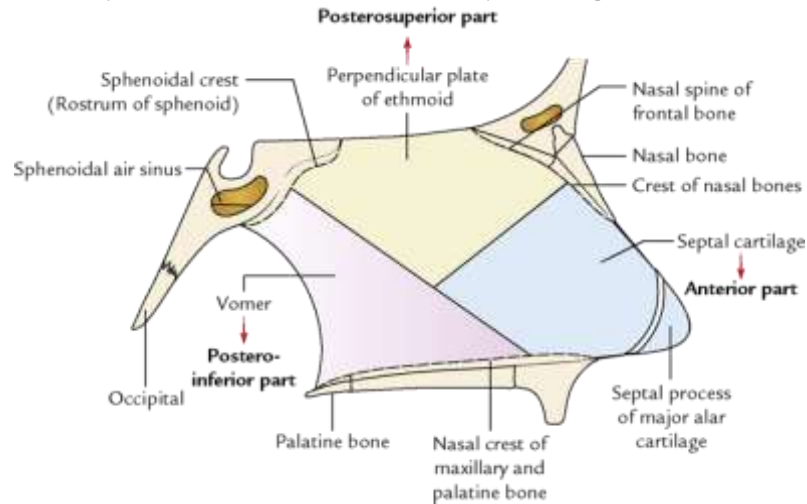
Upward invasion- proptosis, diplopia,

Downward invasion- bulge or ulceration of palatal roof,

Medial invasion- encroaches nasal cavity leading to obstruction and epistaxis, lateral invasion-swelling in face and palpable mass in gingivo-labial groove, posterior invasion- referred pain in upper teeth.

NASAL SEPTUM- FORMATION, BLOOD SUPPLY AND NERVE SUPPLY (SE)

Nasal septum divides the nasal cavity into right & left halves.



Formation:

Bony part

postero-inferiorly vomer,

postero-superiorly- perpendicular plate of ethmoid

Cartilaginous part

septal cartilage, septal process of alar cartilage

Small contribution from the following bones- crest of nasal bone, nasal crest of palatine and maxillary bone, rostrum of sphenoid

Blood supply

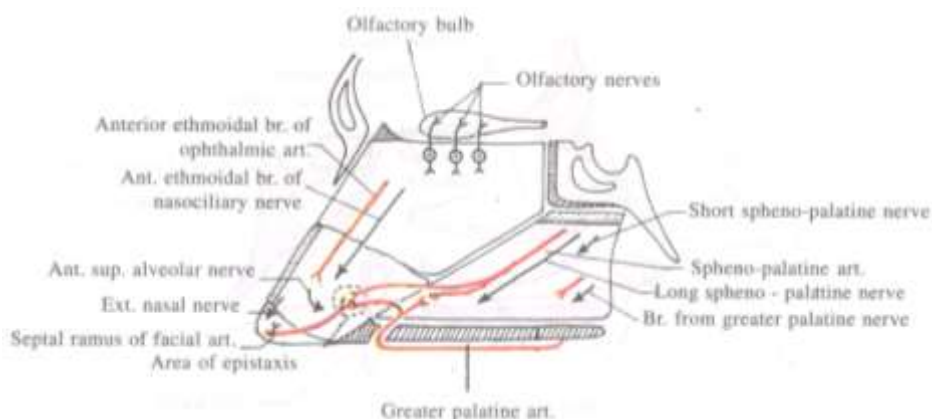
Arterial supply

Anterosuperior part - by anterior ethmoidal artery

Postero inferior part - by sphenopalatine and greater palatine artery

Mobile part of septum - by septal branch of facial artery

Venous drainage: drains into facial and pterygoid venous plexus



Nerve supply:

Olfactory zone

By olfactory nerves.

Antero superior part

By anterior ethmoidal nerve

Intermediate part

By long sphenopalatine nerve

Posterior part

By short sphenopalatine nerve, nerve of pterygoid canal and nasal branches of greater palatine nerve.

Antero inferior part

By anterior superior alveolar nerve.

Mobile part

By external nasal nerve.

MAXILLARY AIR SINUS (SE)

It is a Largest paranasal air sinus in the body of maxilla.

Boundaries:

It is pyramidal in shape, having apex, base, roof, floor, anterior and posterior wall.

Apex:

Directed laterally towards zygomatic bone

Base:

Directed medially, formed by lateral wall of nose.

There is a large opening called hiatus, which is close to the roof.

In the intact skull the large hiatus is made smaller by overlapping of four bones-

Uncinate process of ethmoid from above,

Descending part of lacrimal bone anteriorly,

Inferior nasal concha from below and

Perpendicular plate of palatine bone posteriorly.

Roof:

Formed by floor of orbit, related to infraorbital vessels and nerve

Floor:

Formed by the alveolar process of maxilla, lies below the level of floor of nasal cavity, related to upper molar and premolars

Anterior wall:

Anterior wall of maxilla, related to infra-orbital plexus of nerves, anterior superior alveolar nerve

Posterior wall:

Formed by infratemporal surface of maxilla, related to posterior superior alveolar vessels and nerves

Drainage:

Opens into the middle meatus of nose in the lower part of hiatus semilunaris which is close to the roof of the sinus

Arterial supply:

Facial, infraorbital, greater palatine arteries

Venous drainage:

Facial vein, pterygoid venous plexus

Lymphatic drainage:

Submandibular lymph nodes

Nerve supply:

Infraorbital, anterior, middle and posterior superior alveolar nerves

Applied aspects:

Maxillary sinusitis - Inflammation of maxillary sinus
carcinoma of maxillary sinus

COMPONENTS OF NASAL SEPTUM (SA)

Formation:

Bony part

postero-inferiorly vomer, postero-superiorly- perpendicular plate of ethmoid

Cartilaginous part

septal cartilage, septal process of alar cartilage

Small contribution from the following bones

Crest of nasal bone, nasal crest of palatine and maxillary bone, rostrum of sphenoid

BLOOD SUPPLY OF NASAL SEPTUM (SA)

Arterial supply:

Antero superior part

by anterior ethmoidal artery

Postero inferior part

by sphenopalatine and greater palatine artery

Mobile part of septum

by septal branch of facial artery

Venous drainage:

Drains into facial and pterygoid venous plexus

NAME PARANASAL AIR SINUSES (SA)

Paranasal air sinuses are bony spaces containing air around the nasal cavity.

The sinus is arranged in pairs and is named below:

Frontal air sinuses,

Ethmoidal sinuses-, anterior, middle, posterior groups.

Maxillary air sinuses,
Sphenoid air sinuses