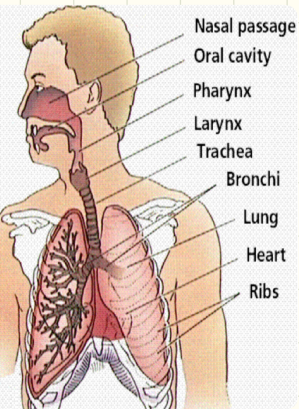


Lecture (1)

The nasal cavity

Respiratory tract: Content



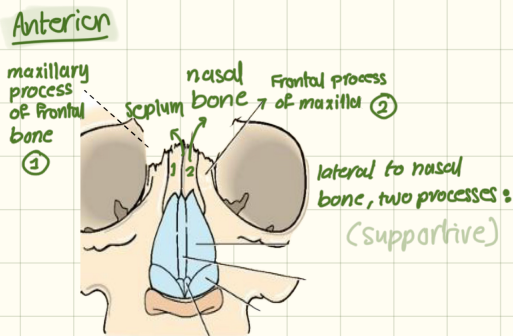
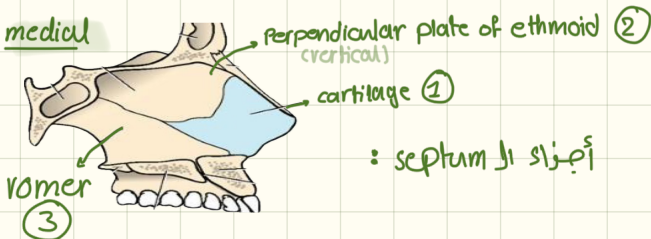
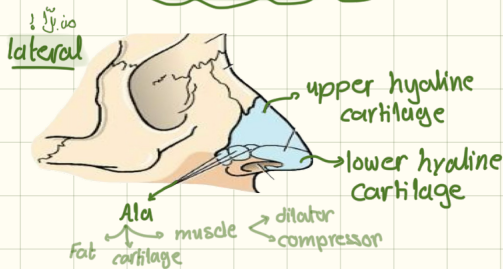
- 1) Nasal cavity
- 2) pharynx → naso
oro
laryngo
- 3) Larynx
- 4) Trachea
- 5) Bronchi → main secondary tertiary
rt. lt. rt. lt.
- 6) Bronchioles
- simple squamous epithelium
- (No cartilage)
- 7) alveolar duct
- 8) alveoli → each alveolus has network of capillaries
(billions in each lung) أشجار و كأنها جـ موزون

conducting → For passage of air only
respiratory → gas exchange

Function

- 1) Gas exchange
- alveoli are full of O_2 surround by capillaries → take O_2 → body cell
give CO_2 * أدايحي جـ رادي المستثنى مناهة
منه عينة دم من Afterly عشان
يخلف نسبة الـ gases في الدم
- 2) Regulates blood Ph
→ O_2 نسبة (تقل) → CO_2 نسبة (تقل)
- 3) Filters inspired air
→ ① vestibule (stratified squamous keratinized epithelium) hair follicles
- contains vibrissae: thick hair
→ ② Glands → secretions trap foreign bodies & dust
- 4) Receptors for smell & produce vocal sounds (phonation)
roof of the nose has bipolar cells = olfactory (N).
True vocal cords in larynx
- 5) Excretes small amount of water & heat → The function of the mucus membrane
it has goblet cells + glands that secrete mucus
plexus of veins in submucosa to warm the air (الغواص الدموي في الجدار)
injury ممكن يتسبب في brain cells

1 External nose



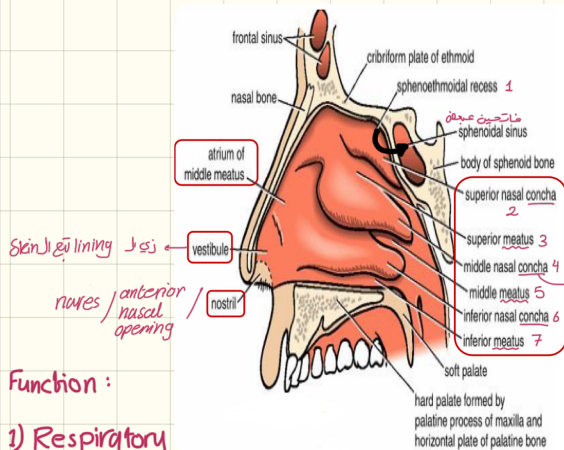
Nerve

- 1) Infraorbital → maxillary N.
- 2) external nasal → anterior ethmoidal
- 3) infraorbital → maxillary N.
- 4) infraorbital foramen

Blood

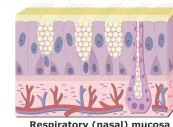
- 1) ophthalmic → internal carotid
- 2) maxillary → external carotid
- 3) facial → external carotid
- 4) Superior labial (upper lip + nose)

2 Nasal cavity



Function:

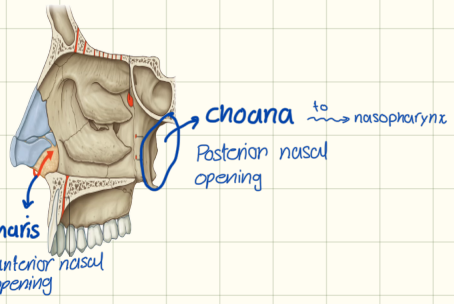
- 1) Respiratory
- 2) olfactory
- 3) Resonance of voice → Paranasal sinuses: cavities in some of skull bones
→ air → Frontal ① - ethmoid ③ - Maxilla ④
- 4) Drains lacrimal fluid: tears secreted from lacrimal glands → roof of the orbital cavity
all have ducts that open in the lateral wall of the nose
collected in the medial angle of eye (lacrimal sac) → nasolacrimal duct → opens at inferior meatus
So ... it drains the tears!
- 5) Protective
- sneezing
- filtration
- proteolytic enzymes (from glands)
- warming & moistening the air



Respiratory (nasal) mucosa

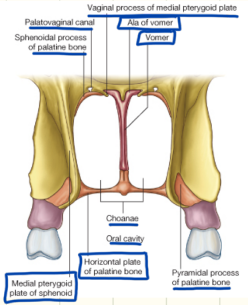
* Some children are born with blocked nasolacrimal duct → drainage = الجـ

Nares

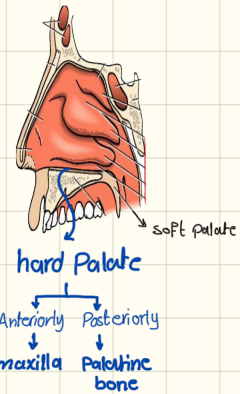


Choana

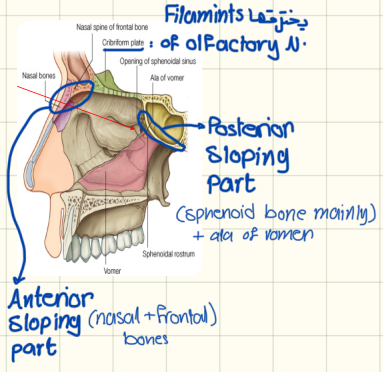
: opening between nasal cavity & nasopharynx.



Floor



Roof



Medial wall

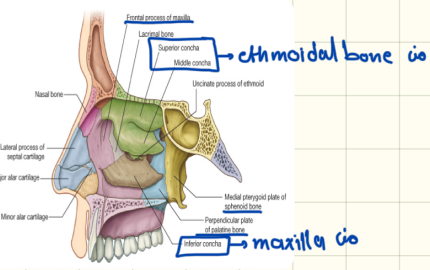
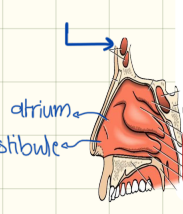
= Septum

- 1) cartilage
- 2) perpendicular plate of ethmoid
- 3) vomer

Lateral wall

3 conchae
3 meatuses

It receives from Paranasal ducts

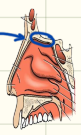


Mucosa

- all are lined with (pseudostratified ciliated columnar)

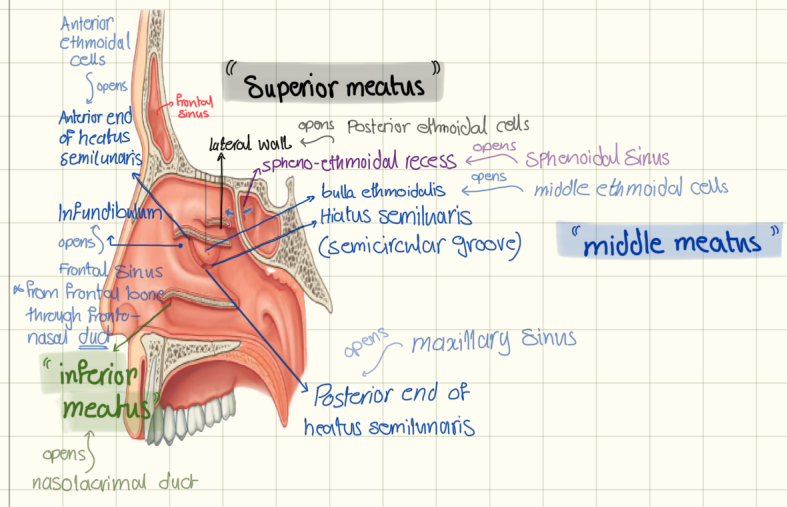
Except

- vestibule → skin
- above the superior concha (olfactory region) → bipolar cells/nerve endings



Conchae

الألوان



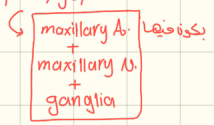
Paranasal sinuses & their site of drainage

- ① Maxillary Sinus → Posterior hiatus semilunaris of middle meatus
- ② Frontal Sinus → Infundibulum of middle meatus
- ③ Sphenoidal → spheno-ethmoidal recess
- ④ Ethmoidal
 - Anterior → Anterior hiatus of middle meatus
 - Middle → bulla ethmoidalis of middle meatus
 - Posterior → lateral wall of superior meatus
- ⑤ Nasolacrimal duct → inferior meatus

Blood

1 Maxillary artery

• From pterygopalatine fossa → to sphenopalatine Foramen

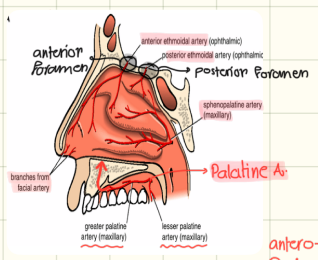


- Branches → ① Spheno-palatine A. → long → Septum (Epistaxis) / short → upper lateral wall
- ② Palatine A. → through palatine canal → to oral cavity
 - lesser palatine A. → soft palate
 - greater palatine A. → hard palate → through incisive Foramen

2 Ethmoidal arteries

• From ophthalmic A. From internal carotid A.

- Branches → ① Anterior ethmoidal A. → From anterior cranial Fossa through anterior ethmoidal Foramen → septum
- ② Posterior ethmoidal A. → through Posterior ethmoidal Foramen → Septum + lateral (Posteriorly) wall



antero-inferior Port of lateral wall of nasal cavity

external nasal A. (Supero-anteriorly) lateral wall

Sensory Arteries

1 Maxillary N.
 ↳ Branches: ① Nasopalatine N.
 ② Palatine N.
 ↳ greater palatine N.
 ↳ lesser palatine N.

2 ophthalmic N.
 ↳ Branches: ① Anterior ethmoidal N.
 ② Posterior ethmoidal N.

3 Olfactory N. (smell sensation)
 ↳ From bipolar cells of the roof
 ↳ cribriform plate as filaments
 ↳ center of smell
 ↳ olfactory bulb

4 Facial N. (Parasympathetic)
 ↳ greater petrosal N.
 ↳ pterygopalatine fossa in the ganglia
 ↳ secretomotor for glands

3 Superior labial & lateral nasal A. → From Facial A.
 ↳ septal A.
 ↳ alar A.
 ↳ (Epistaxis)
 ↳ palpebral → lower eyelid

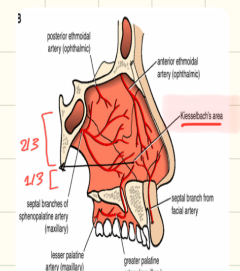
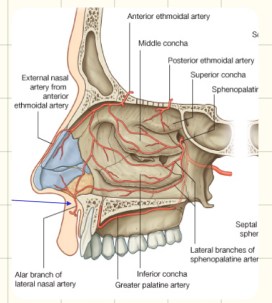
4 Infraorbital
 ↳ nasal A.
 ↳ labial A.

Epistaxis → Bleeding through the nose

* Kiesselbach's area : area of anastomosis between upper 2/3 & lower 1/3 of the septum !
 nose bleeds

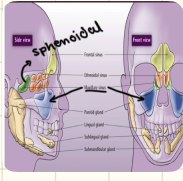
* long sphenopalatine A. + Superior labial A.
 ↳ anastomosis

-veins ① Anteriorly : Facial v. → common facial v. → internal jugular v.
 ② Posteriorly + Superiorly : pterygoid plexus → maxillary v.
 ↳ of veins
 ↳ (lateral pterygoid muscle)
 ↳ Parotid gland



Paranasal sinuses

- 1 Ethmoidal 3
- 2 sphenoidal
- 3 maxillary



- 4 Frontal * at birth (rudimentary) → growth
- each has cavity lined by thin mucosa + contains air
- their ducts open in (lateral wall of nose)

Lymph

Anteriorly : Submandibular nodes
 Posteriorly + superiorly : Retropharyngeal / deep cervical
 ↳ deep cervical

• Function :

- 1 Resonance of voice
- 2 Decrease weight of the skull
- 3 Protection

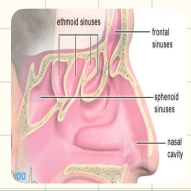
Frontal sinuses :

- ↳ drainage : infundibulum of middle meatus
- ↳ innervation : Supra-orbital N. From ophthalmic N.

Ethmoidal cells : in ethmoid bone

- ↳ drainage : ① Anterior → anterior of hiatus semilunaris of middle meatus
- ② middle → bulla ethmoidalis of middle meatus
- ③ Posterior → Superior meatus

- ↳ innervation : nasociliary N. From ophthalmic N.

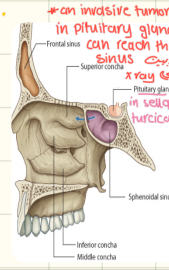


Sphenoidal sinuses : in sphenoid bone

- ↳ drainage : spheno-ethmoidal recess
- ↳ innervation : ① Posterior ethmoidal N. from ophthalmic N.
- ② maxillary N.

Relations :

- Above : Pituitary gland
- laterally : cavernous sinuses



Maxillary sinuses : * The largest * Pyramidal in Shape *

- ↳ drainage : Posterior hiatus semilunaris of middle meatus
- ↳ innervation : infra-orbital N. & orbital N. From maxillary N.

* its duct is directed upwards → bad drainage

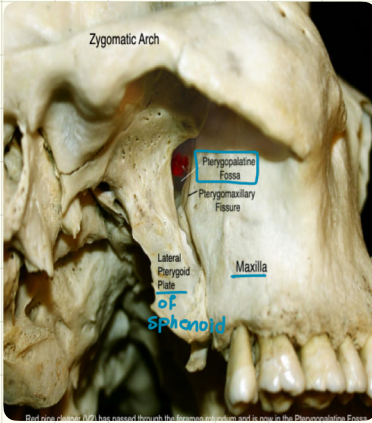
* Extraction of upper teeth might lead to fistula + sinusitis → Pus in oral cavity

Relations :

- Above : orbit
- Below : roots of premolar + molar teeth
- Behind : infratemporal fossa
- Medially : lower part of nasal cavity

Lecture (2)

Pterygopalatine fossa



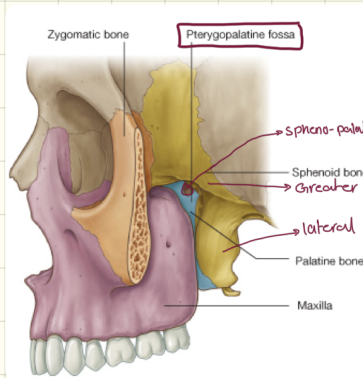
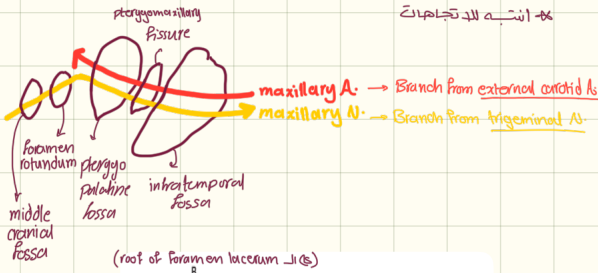
- tear-drop shaped منقوبة
- between maxilla & sphenoid bones
- immediately posterior to the maxilla

Surrounding organs ؟ ملقطة وصل فيها

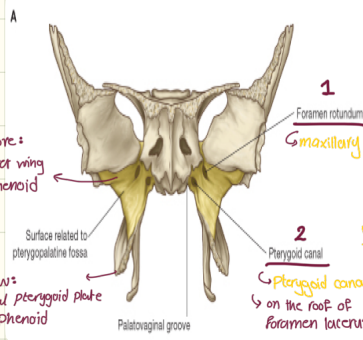
- 1) orbit
 - 2) nose - (عن طريق Sphenopalatine Foramen)
 - 3) oral cavity
 - 4) naso pharynx
 - 5) middle cranial
 - 6) infratemporal fossa
- ↳ Blood + nerve supply يتفرع

The walls

- Anterior : posterior surface of maxilla
- Medial : Palatine Bone
- Posterior : lateral pterygoid plate of sphenoid
- Roof : Greater wing of sphenoid
- lateral : Free $\rightarrow$ infratemporal fossa (pterygomaxillary fissure اسم الفجوة)



من هنا فيها Spheno-palatine A. + V. $\rightarrow$ long $\rightarrow$ Nasal cavity, short $\rightarrow$ Nasal cavity



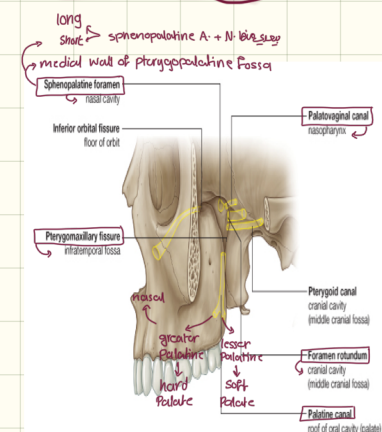
1 + 2 : Pterygopalatine JI مع middle cranial JI يوصلوا ال fossa

in pterygopalatine fossa Facial N. $\rightarrow$ Parasympathetic fibers (greater petrosal N.) Preganglionic $\rightarrow$ Pterygopalatine ganglion, Sympathetic fibers (deep petrosal N.) Post-ganglionic

Content

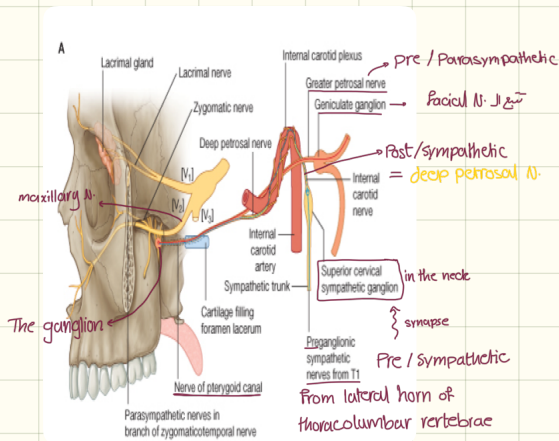
- 1) maxillary N. $\rightarrow$ through Foramen rotundum from middle cranial fossa
- 2) maxillary V. $\rightarrow$ from infratemporal fossa
- 3) pterygoid canal N. $\rightarrow$ from middle cranial to the ganglia
- 4) pterygopalatine ganglion $\rightarrow$ Parasympathetic fibers
- 5) veins + lymphatics $\rightarrow$ A. + N.

Gateways



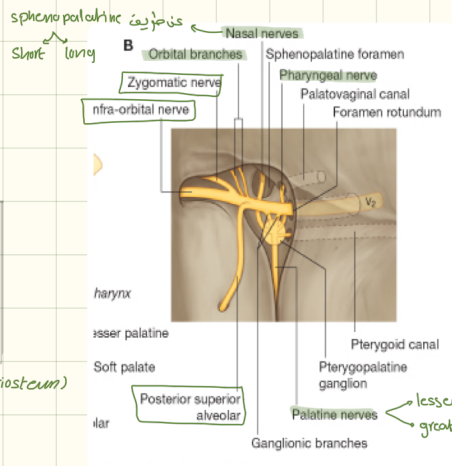
- 1) Foramen rotundum + pterygoid canal $\rightarrow$ maxillary N. (sym + parasympathetic)
 - 2) Palatovaginal canal $\rightarrow$ nasopharynx (Blood + Nerve supply)
 - 3) Palatine canal $\rightarrow$ Palatine A. (greater + lesser)
 - 4) sphenopalatine Foramen $\rightarrow$ maxillary A. $\rightarrow$ Pterygopalatine fossa, maxillary V. $\rightarrow$ Pterygopalatine fossa
 - 5) pterygomaxillary fissure $\rightarrow$ orbit
 - 6) inferior orbital fissure $\rightarrow$ orbit
- يوصل فيها maxillary A. + N. من infratemporal fossa

pterygopalatine ganglion



• pterygopalatine ganglion

- ① Pre / Parasympathetic : Greater petrosal N. → branches of maxillary N. + A.
- ② Post / sympathetic : Deep petrosal N.
- ③ sensation of the ganglia : two branches of maxillary N.



glands ← secretomotor fibers → carries

Maxillary N.

- pure sensory
- originates from trigeminal ganglia in cranial cavity
- → Foramen rotundum

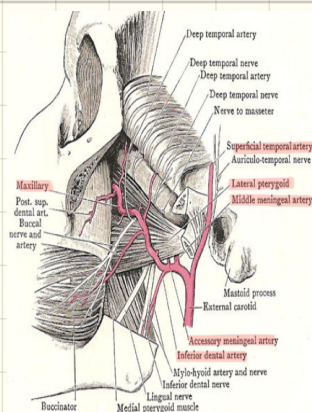
infra-orbital fissure ← branches in pterygopalatine fossa ← ganglia (sensory)

Branches :

- ① Meningeal (Before it enters the fossa)
- ② Two ganglionic branches
 - ↳ facial → greater petrosal alveolar → Post/para maxillary alveolar → sensory
 - ↳ Two branches is given by sphenopalatine ganglion
- ③ Zygomatic
 - ↳ zygomaticotemporal : carries para. secretomotor → lacrimal N.
 - ↳ zygomaticofacial → sensory
- ④ Posterior superior alveolar → sensory for last 3 molars
- ⑤ Infra-orbital → sensory

palpebral (lower eyelid) nasal (external nose) labial (upper lip)

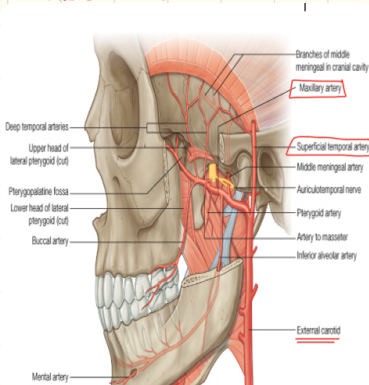
Arteries



Maxillary A.

- branch of external carotid A. in neck
- originates adjacent to the neck of mandible, within parotid
- infratemporal → pterygomaxillary → pterygopalatine fossa
- middle cranial → foramen rotundum → pterygopalatine fossa → pterygomaxillary fissure → infratemporal fossa
- lateral pterygoid muscle divides maxillary A. into 3 parts

usually posterior to the A., sometimes anterior. its insertion = neck of the mandible



First Part

all of 5 branches pass through foramen or openings.

- 1) Inferior alveolar A. → mandibular foramen → supplies all lower teeth (lower jaw)
- 2) Middle meningeal A. → Foramen Spinosum → cranial fossa (intra cranial)
- 3) Accessory meningeal A. → Foramen oval → cranial fossa (intra cranial)
- 4) Deep Auricular A. → through the auricle (ear)
- 5) Anterior tympanic A. → through the auricle (ear)

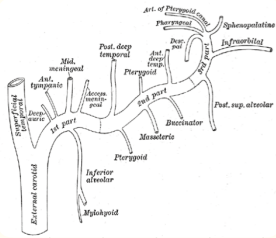
inferior alveolar N. → sensory for lower jaw

mandibular N. → sensory for lower jaw

Second Part

* 5 muscular branches for muscles of mastication

- 1) To Temporalis
- 2) To masseter
- 3) To medial pterygoid
- 4) To lateral pterygoid
- 5) buccal



Third Part

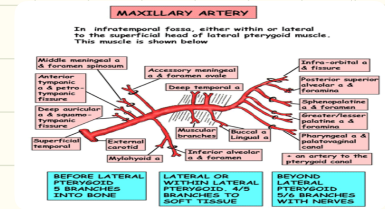
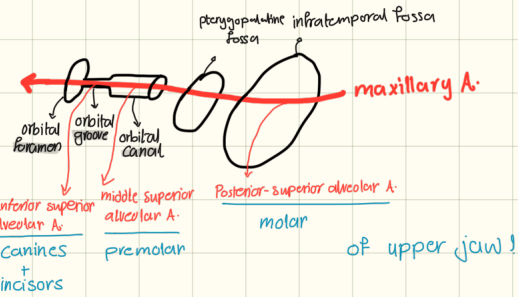
⇒ all Supply (sinuses + oropharynx + orbit + nose + upper teeth)

* Branches distributed with:

↳ Branches of the ganglia

+ Branches of maxillary A.

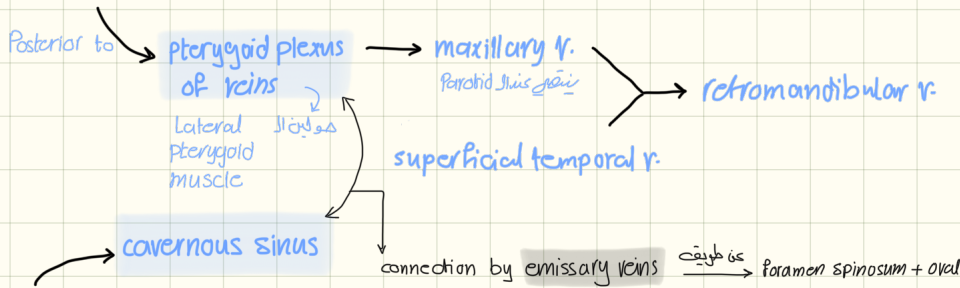
- 1) Palatine A. → greater → Palatine canal → hard palate → Nose → Posterior inferior quadrant of the lateral wall of the nose.
- 2) sphenopalatine A. → long → Palpebral → nasal labial
- 3) Infra Orbital A. → middle superior alveolar A. → anterior superior alveolar A. → supply: canines + incisors
- 4) Pharyngeal A. → through Palatovaginal Foramen → to nasopharynx
- 5) The posterior superior alveolar * in infratemporal fossa
- 6) Pterygoid canal A. → supplies The canal + mucosa of nasopharynx



VEINS

* arteries Juss

* (pterygopalatine) في بجمجوا Veins في Fossa



* infra orbital V. بجمجوا

Lecture (3)

Larynx

Function

1] Open valve → Respiration

2] closed valve → Deglutition

3] Partially closed → voice

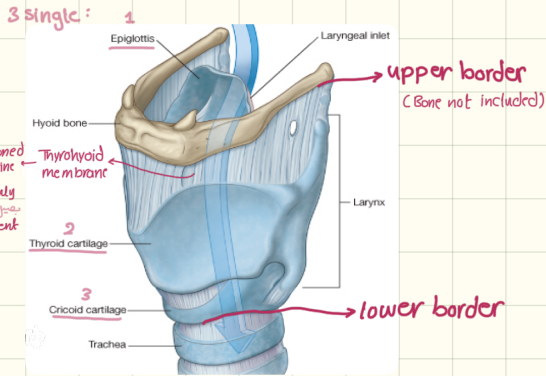
4] closed vocal cords → effort

5] Coughing → at first the vocal cords are adducted //
 (يُضيق الحبال الصوتية مع expiration) →
 So it opens ← larynx suddenly!

- bolus pushes epiglottis down wards
- larynx up
- muscles of the int. contracted

Mechanism of articulation =
 الكلام
 • Vibration to vocal cords
 • Partitioning of pharynx
 • affects muscles of pharynx mouth nose
 • توضع الأصرف

- From C₃ - C₆
- Box of cartilage (9) → 3 single
 3 single: 1

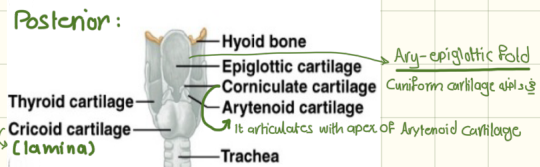
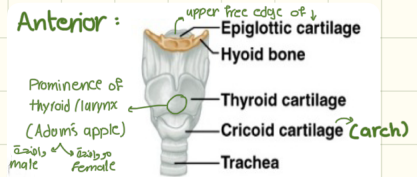


بالترتيب من الداخل إلى الخارج:

- 1] lined by respiratory mucosa → (pseudostratified ciliated columnar + goblet cells)
 ↳ except True vocal cord → (stratified squamous)
- 2] Cartilages
- 3] Membranes + ligaments (connect cartilages together)
- 4] Intrinsic muscles → all are innervated by recurrent laryngeal N. except for cricothyroid muscle supplied by external laryngeal N.)
- 5] Connective tissue

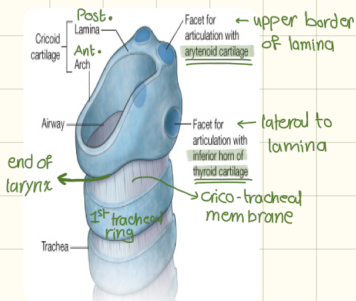
Cartilage

- Single: 1) Epiglottis 2) Cricoid 3) Thyroid
- Pairs: 1) Arytenoid 2) Cuneiform 3) Corniculate



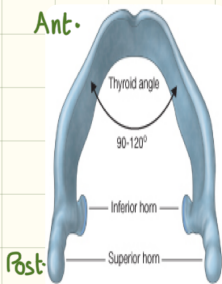
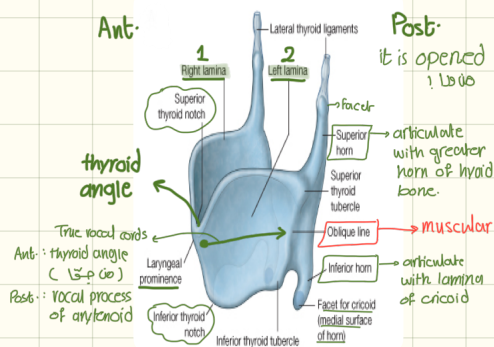
1) Cricoid cartilage

- Signet ring shaped



2) Thyroid cartilage

- 2 lateral lamina → right left



* The angle in males → acute
 Female → obtuse
 الذكور حاد
 الإناث منفرج

- Testosterone

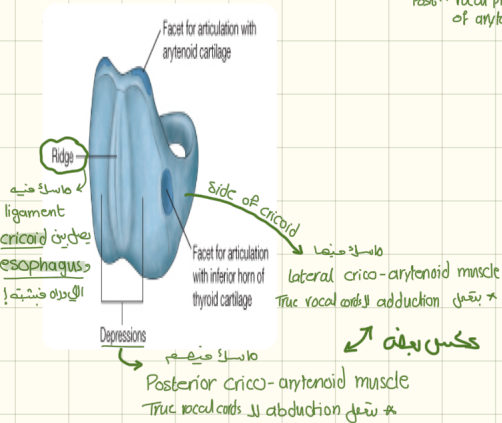
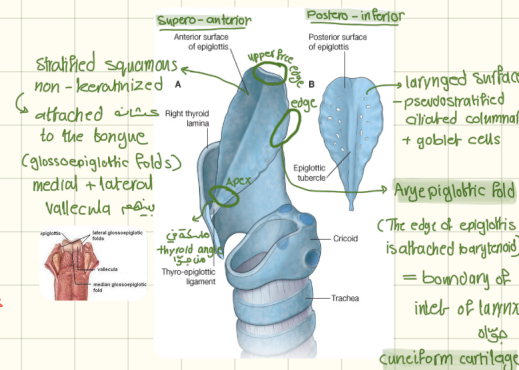
- Heavy bones
- Bulky + Strong muscles
- Acute angle
- long
- Relaxed
- low pitch of voice

Females:

- Estrogen + progesterone

- light bones
- Smooth muscles
- obtuse angle
- short
- Tense
- high pitch of voice

3) Epiglottis

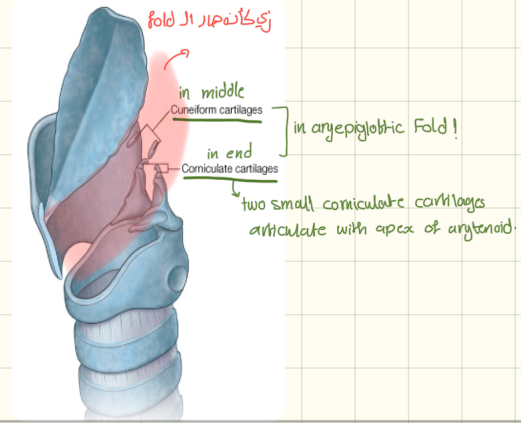
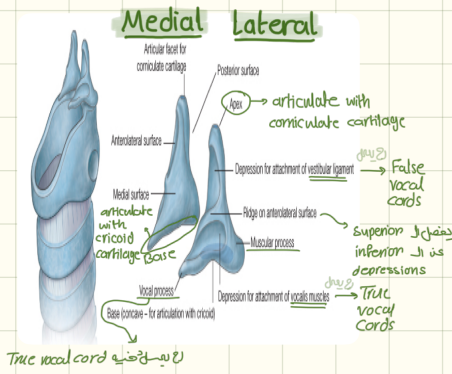


both muscles are innervated by recurrent laryngeal N.

1) Arytenoid cartilages

2) Corniculate cartilage

3) Cuneiform cartilages



Ligaments

Extrinsic

Intrinsic

1) Thyrohyoid membrane

1) cricothyroid ligament

2) Hyo-epiglottic ligament

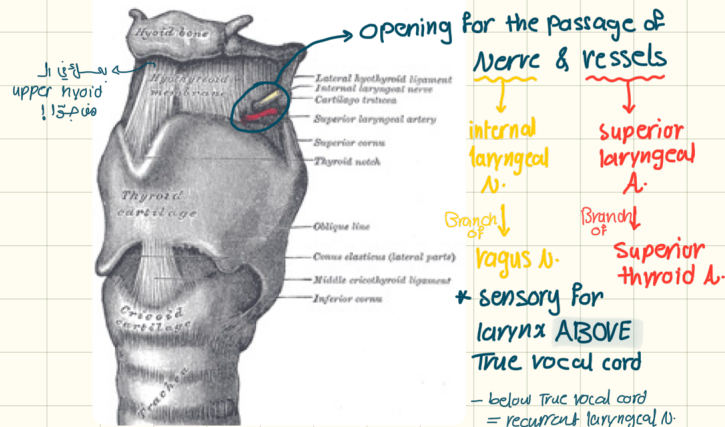
2) quadrangular membrane

3) Cricotracheal ligament

↓
Fibro-elastic membranes

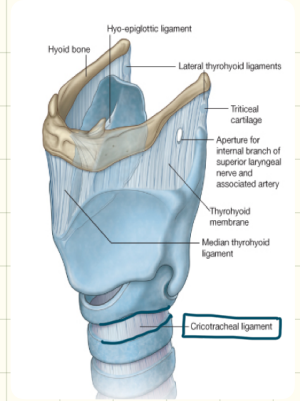
1) Thyrohyoid membrane

- ligaments in the middle + laterally
! membrane



2) Cricotracheal ligament

- from cricoid c. to 1st tracheal ring.



1) Cricothyroid ligament

- origin: inner surface of cricoid c.
↳ upwards to thyroid c. (Free edge)
end: Free edge making vocal ligament
the base of vocal fold!

2) Quadrangular membrane

- origin: edge of epiglottis
↳ downwards to thyroid c.
end: Free edge making vestibular ligament
the base of vestibular fold!
False vocal cord
covered by respiratory mucosa

emergency

عن ذالك كى يمزق ينفخ
suprasternal notch
يمكن يمزق
Cricoid
5
6



operation

thyroidectomy
يمكن يمزق recurrent laryngeal N.
• adducted true vocal cords
• Suffocation
• كذا الفنتا تكون تحت ال
True vocal cords
عن ذالك كى يمزق

أسعار تانية:

✓ crico-vocal ligament

✓ conus elasticus ligament

• vocal cord:

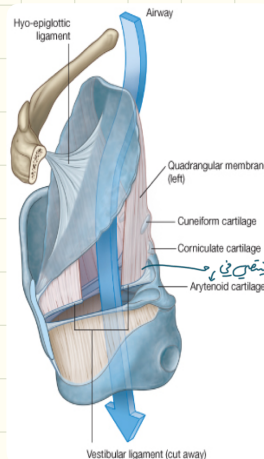
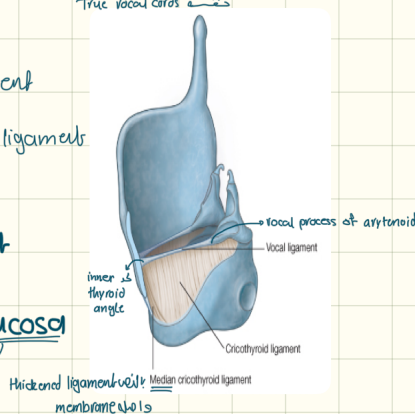
1. vocal ligament

2. vocal muscle

3. covered by mucosa

stratified squamous non-keratinized

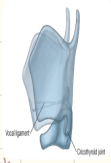
ليش؟ لانه موصى يمزق
injury → Regeneration (mitosis)



joints

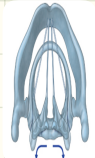
1) Cricothyroid joint

- Between inferior horn of thyroid c. & Cricoid c.
- Synovial
- moves (Forward) then (Rotates internally)
- Tense of True vocal cords



2) Crico-arytenoid joint

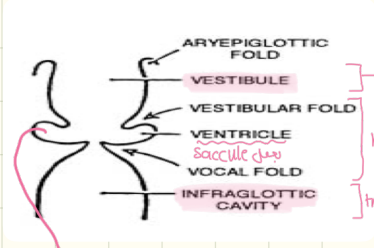
- Rotatory movement
- Affects two muscles
- Post. cricoarytenoid + Ant. cricoarytenoid
- Abduction
- Adduction



Cavity

laryngeal cavity:

- 1) laryngeal vestibule
- 2) middle = glottic
- 3) lower = infraglottic

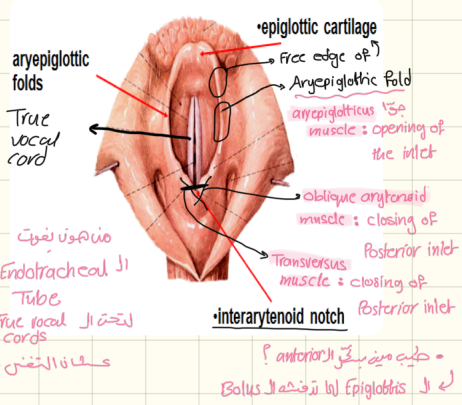


From: inlet into: false vocal cords
middle: from false to true
trachea

saccul goes upwards filled with glands... why?

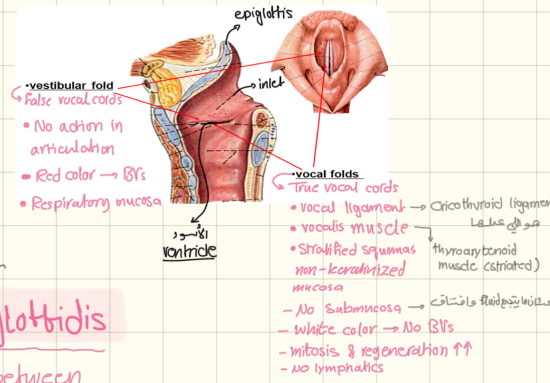
It secretes seromucous secretion for true vocal cord lubrication.

① laryngeal inlet



Endotracheal tube
True vocal cords
Epiglottis

② Vestibular & vocal folds

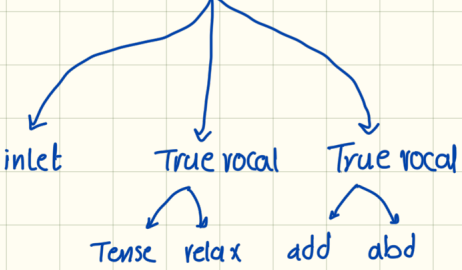


• vocal ligament
• vocalis muscle
• Striated squamous non-keratinized mucosa
• No submucosa
• white color → No BVs
• mitosis & regeneration ↑
• no lymphatics

③ Rima vestibuli & rima glottidis

Space between false vocal cords
Space between true vocal cords
wide: by abduction
narrow: by adduction

Muscles

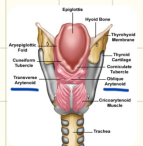


① Inlet

open: Aryepiglotticus muscle

close: Transversus arytenoid
Oblique arytenoid

origin: posterior surface of arytenoid of one arytenoid
insertion: posterior surface of arytenoid of the other arytenoid
origin: muscular process of arytenoid
insertion: apex of opposite arytenoid

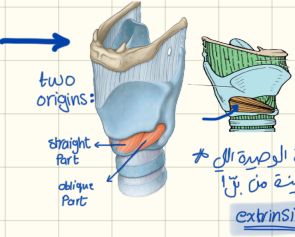


Extrinsic:

- supra hyoid
Elevators of the larynx:
- 1. Digastric muscle
- 2. Stylohyoid
- 3. Mylohyoid
- 4. Geniohyoid

② True

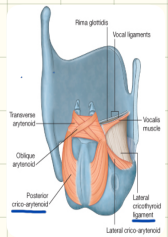
Tense: cricothyroid muscle
Relax: Thyroarytenoid (vocalis) muscle



العضلة الوحيدة التي
مسببة صوت
extrinsic

③ True

Adduction: Lateral cricoarytenoid muscle
Abduction: Posterior cricoarytenoid muscle



-infrahyoid

- Depressors of the larynx:
- 1. Sternothyroid
- 2. Sternohyoid
- 3. Omohyoid

* all are innervated by Recurrent laryngeal N. Exepts cricothyroid muscle external laryngeal N.

* Vagus N. → Superior laryngeal N. external (motor) internal (sensory)

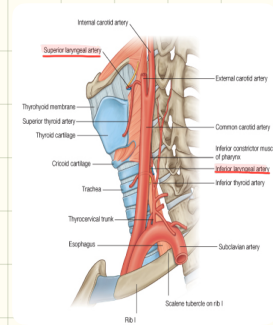
Sumayya Haj Yasin

Lecture (4)

Larynx Cont.

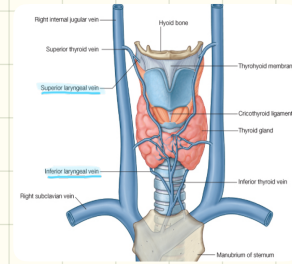
Arteries

- ① Superior laryngeal A. $\xrightarrow{\text{also gives}} \text{internal laryngeal A.}$ $\xrightarrow{\text{also gives}} \text{external laryngeal A.}$ $\xrightarrow{\text{also gives}} \text{Superior thyroid A.}$ $\xrightarrow{\text{also gives}} \text{external carotid A.}$
- ② Inferior laryngeal A. $\xrightarrow{\text{also gives}} \text{Inferior thyroid A.}$ $\xrightarrow{\text{also gives}} \text{recurrent laryngeal A.}$ $\xrightarrow{\text{also gives}} \text{thyrocervical trunk}$ $\xrightarrow{\text{also gives}} \text{Subclavian A.}$



Veins

- ① Superior laryngeal v. $\xrightarrow{\text{also gives}} \text{Superior thyroid v.}$ $\xrightarrow{\text{also gives}} \text{internal jugular v.}$
- ② Inferior laryngeal v. $\xrightarrow{\text{also gives}} \text{Inferior thyroid v.}$ $\xrightarrow{\text{also gives}} \text{left brachiocephalic v.}$



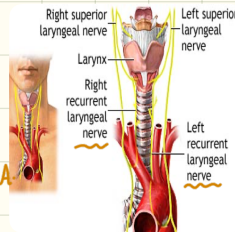
Lymphatics

- Above true vocal cords $\rightarrow$ Deep cervical lymph nodes
- Below true vocal cords $\rightarrow$ Paratracheal lymph nodes

Nerves

- Superior laryngeal N. $\rightarrow$ external laryngeal N. $\rightarrow$ internal laryngeal N. $\rightarrow$ inferior vagal ganglia
 - Recurrent laryngeal N. (Left $\rightarrow$ right)
 - Left: chest $\rightarrow$ below arch of aorta
 - Right: root of neck $\rightarrow$ below rt. subclavian A.

then, they return upwards between esophagus + trachea
- sensory $\rightarrow$ Above true vocal cord : internal laryngeal N.
 Below true vocal cord : recurrent laryngeal N.
- motor : all recurrent laryngeal N. EXCEPT cricothyroid external laryngeal N. muscle



Relations

- on each side $\rightarrow$ Carotid Sheath (A. + v. + N.)

Clinical

- in case of thyroid tumor $\rightarrow$ Thyroidectomy

Sup. thyroid A. ligation

Inf. thyroid A. ligation

* complete injury : cut for all nerve fibers

* Partial injury : superficial fibers injury
 $\rightarrow$ abductor muscles are injured
 $\rightarrow$ adduction
 خنطيل

injured external laryngeal N. $\rightarrow$ unilateral $\rightarrow$ voice weakness
 $\rightarrow$ bilateral $\rightarrow$ voice hoarseness

suprasternal tracheostomy $\leftarrow$ suffocation

* Partial bilateral : Adduction $\rightarrow$

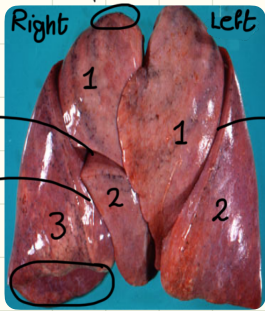
* complete bilateral : midway difficulty in respiration $\leftarrow$ add + abd

* Partial unilateral : one cord adducted

* complete unilateral

Lung

Apex : 1 in above medial 1/3 of clavicle (root of neck)



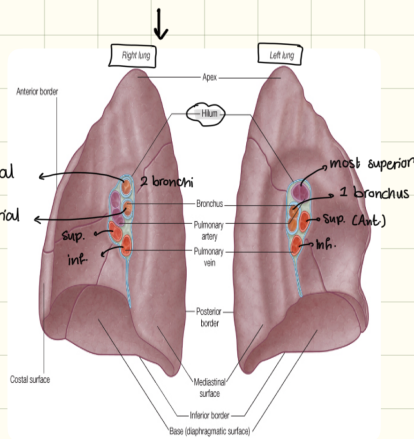
Base : lays over capula of diaphragm.

• 3 Borders

- 1) Posterior (Rounded)
- 2) Anterior (sharp)
- 3) Inferior (sharp)

• 2 Surfaces

- 1) Costal (costal cartilages)
- 2) mediastinal (medial)



In hilum: Pulmonary A. (2), Pulmonary V. (2), main bronchus (2), nerves (2), lymphatics (2)

• Surface Anatomy

- Apex : 1 in above medial 1/3 of clavicle covered by ① Parietal pleura

② Visceral pleura

✓ Sealing of thoracic cavity ← ③ Suprapleural membrane to maintain intrathoracic pressure

- Anterior Border : from Apex → curved to sternoclavicular joint

→ medial border of sternal angle → edge of sternum → 6th costal cartilage

* The left Ant. border has Cardiac Notch : semi-circle (1 cm) between 4th - 6th ribs

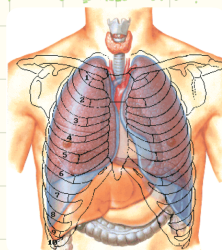
No pleura nor lung = empty space! cardiac tympanic غمالة ناعلة لا بها بضع

- Inferior Border / Base :

1) midclavicular line → 6th rib

2) midaxillary line → 8th rib

3) Posteriorly → 10th Thoracic vertebral line (T10 dorsal spine) (4cm من الخط الفقراني)



according to Pleura : • Apex same as lung

• Ant. border same as lung

• Base → midclavicular 8th rib
midaxillary 10th rib
Posteriorly 12th Thoracic vertebral line

when the lung is inflated it extends downwards to fill the spaces

Two spaces

Suction Site :- midaxillary 9th rib ← Accumulation of air (pneumothorax)
midclavicular 7th rib ← Blood (fluid) Pus (empyema)

• Right lung

* Shorter + Broader

- oblique fissure : start posteriorly 4 cm away from T4

→ 5th intercostal space → 6th rib

- Transvers fissure : starts anteriorly 4th costal cartilage

→ 5th intercostal space
6th rib

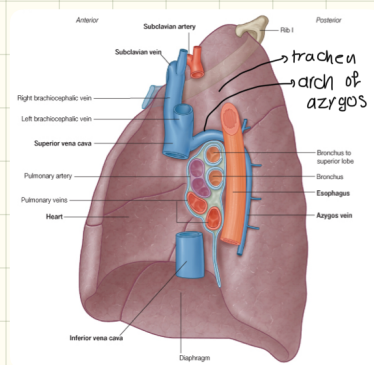


- impressions : deoxygenated

• IVC • SVC • right atrium

• azygos vein • arch of azygos

• esophagus • 1st rib • Trachea (deviated to the right)



• Left lung

- oblique fissure start posteriorly 4 cm away from T4

→ 5th intercostal space → 6th rib

- impressions : oxygenated

• Heart (left ventricle)

• aortic arch

• thoracic aorta

• esophagus (lower lung only)

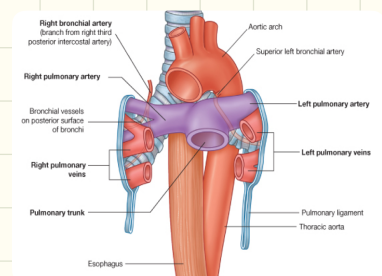
Pulmonary arteries

From right ventricle → T5

- Rt. → hilum → divided
- Lt. → hilum → most superior

Pulmonary veins

2 Rt. 2 Lt. → left atrium
* oxygenated blood



Bronchial arteries

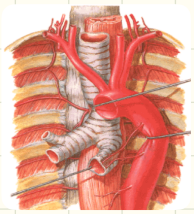
- main blood supply for lung tissue through hilum

(Rt.)

• 3rd Posterior intercostal A:

(Lt.)

• 2nd + 3rd Posterior intercostal A:



Branch of
Branch of
descending thoracic A:

lymphatics

تجميع

⇒ hilum of the lung → paratracheal → broncho-mediastinal trunk

right
↓
right lymphatic duct

left
↓
thoracic duct

Beginning of brachiocephalic V.

Bronchial veins

- they drain into either → left atrium
→ azygos vein

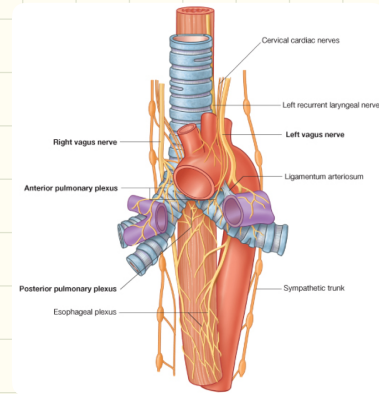
(venous drainage for all chest along with hemi-azygos in the left → SVC)

Innervation

- Pulmonary plexus of nerves → Ant. end of trachea (Voi)
→ Post. end of trachea (Voi)

• Parasympathetic → vagus N. (Bronchoconstriction + vasodilation)

• Sympathetic → cervical sympathetic ganglia (Bronchodilation + vasoconstriction)



Lecture (6)

Pleura

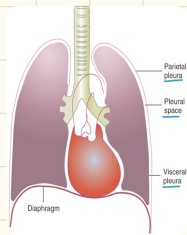
- A cavity contains lungs

visceral

Parietal

lung tissue
lobes + fissures

lining thoracic cage



- Between them: Potential space
It contains 5-10 ml normal fluid for lubrication

Function

1) Protection

2) Produces fluid that allows for lubrication

→ When fluid decreases → Friction → Pleuritis

- * in pleural sac
 - air → Pneumothorax
 - Fluid → Pleural effusion
 - Pus → Empyema
 - blood → Haemothorax

أجزاء الـ Pleura

① cervical pleura (Dome of pleura)

→ In Cervical region

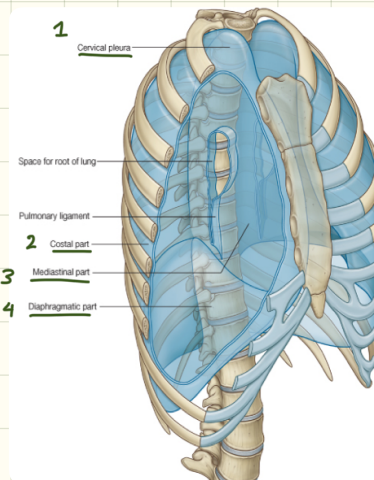
- 1 in above medial 1/3 of clavicle
- 3-4 cm above 1st rib

* Cannula in Subclavian vein: upper surface of 1st rib
collapsable air → Pleural effusion
X-ray

→ 3 membranes:

- 1) Supra pleura
- 2) Parietal
- 3) Visceral

 → adhere to investing deep fascia coming from neck downwards (Sibson's Fascia)
sealing thoracic cage
maintaining intrathoracic pressure



② Costal Part → Between ribs & costal cartilage

③ Mediastinal Part → covers mediastinal surface of lung (Parietal + visceral adhere together → sleeve around the hilum ⇒ Pulmonary ligament)

④ Diaphragmatic Part → above diaphragm

• Hilum (T5-T7)

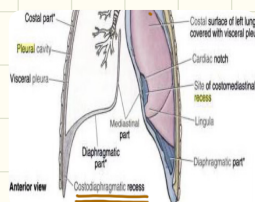
Peripheral Reflections

• When costal meet diaphragmatic: The angle = costodiaphragmatic recess

• When costal meet mediastinal: The angle = costomediastinal recess

* Surface anatomy of pleura

→ Suction posteriorly between 10-12 is rare.



when lung inflates down
this recess is filled with air

* clinically: may be filled with fluid or pus or blood.

- 1 in (midclavicular line)
- 2 in (Scapular line) Posteriorly
- 3 in (mid axillary line)

* Supra pleural membrane

→ Fibrous sheat attached to:

Laterally: medial border of 1st rib & costal cartilage

Medially: blend with sibson's fascia

Apex: tip of transverse process of C7

- protects cervical pleura & lung
- maintain intrathoracic pressure

* Any needle for suction has to be put lower border of the space / upper border of the rib

(V + A + N)

Nerve

• Parietal

↳ lalio
space 3 → Nerve 3

• Visceral

lung ↳ 11 & 12

① Costal pleura: Intercostal N. (segmental)

- pulmonary plexus + Autonomic ↳ Parasympathetic
↳ sympathetic

② Mediastinal + diaphragmatic: Phrenic N. ↳ motor to diaphragm
↳ sensory

- sensitive to stretch

- insensitive to Pain + Temp + Touch

③ Peripheral: lower 6 intercostal N.

- sensitive to Pain + Temp + Touch + Pressure

Arteries

- Intercostal A. ↳ Anterior From Internal thoracic A.
↳ Posterior From descending thoracic A.
- Internal thoracic A. ↳ قوس قزح
- Musculophrenic A.

Veins

- azygos vein (Right)
- Internal thoracic vein (Anteriorly)
- Subclavian vein

Lymphatic

- Parietal pleura ↳ mediastinal nodes
↳ Tracheobronchial nodes
↳ Intercostal nodes
 - Diaphragmatic pleura ↳ Parasternal nodes
↳ Post. mediastinal nodes
 - visceral pleura (along bronchial A.) → bronchopulmonary nodes
- Right → right lymphatic duct
Left → thoracic duct

→ beginning of brachiocephalic v.

Sumayya HajYasin