

EAR, NOSE AND THROAT

(21) Pharynx I

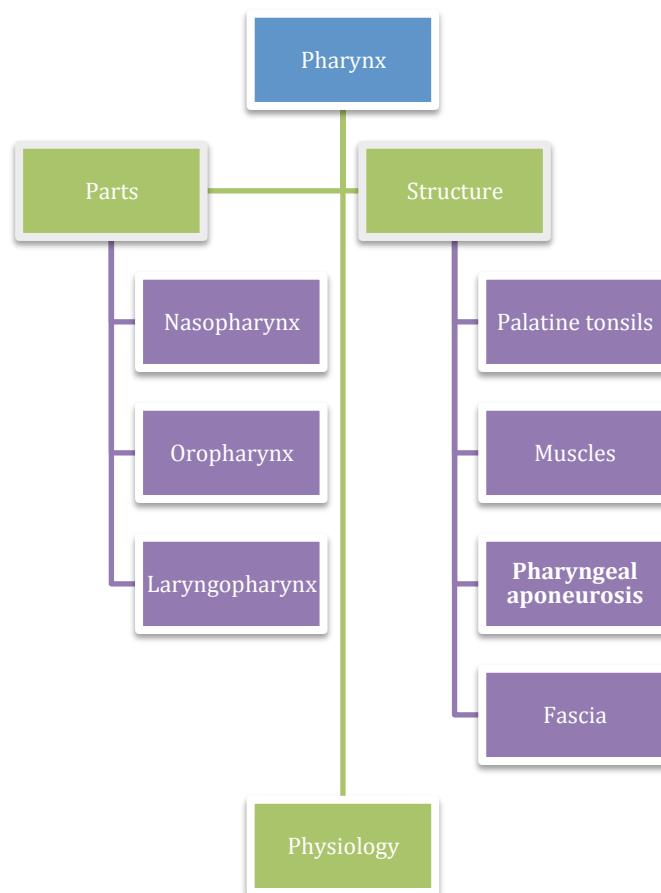
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Objectives:

1. Anatomy of the pharynx and deep neck spaces (retro and parapharyngeal)
2. Physiology (function of pharynx in brief)
3. Acute and chronic pharyngitis (non-specific and specific) e.g. scarlet fever.
4. Infectious monoliasis, fungal, Vincent angina, diphtheria
5. Zenker diverticulation (in brief)



Anatomy of Pharynx

It extends from the base of the skull to the level 6 cervical vertebra at the lower border of cricoid cartilage.

Funnel shaped, 10 cm length.

Parts of the pharynx:

1. Nasopharynx

Opens **anteriorly** to the nose,

Above: the base of skull

Below: soft palate

Laterally:

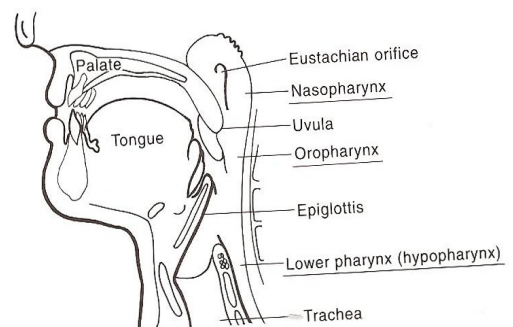
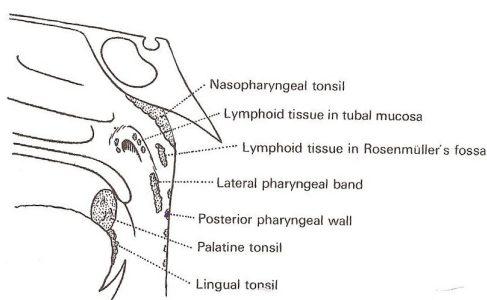
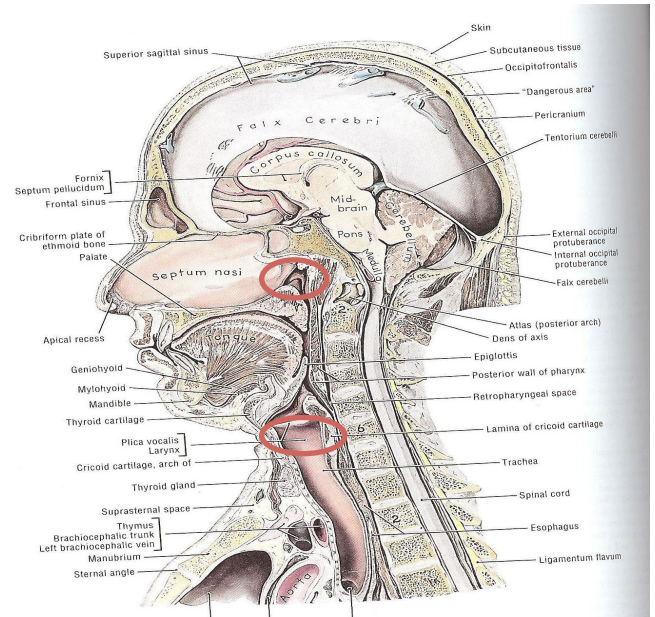
1- Opening of the Eustachian tube

2- Torus tubarius (the elevated edge of the Eustachian tube opening).

3- Pharyngeal recess (fossa of rosenmuller) (Is a depression in the pharyngeal wall behind the torus tubarius) (very important to examine nasopharynx in smoker adult complaining of nasal obstruction because nasopharyngeal cancer commonly occurs in this fossa).

4- Adenoid

5- Nasopharyngeal isthmus (opening in the floor between the soft palate and the posterior pharyngeal wall).



2. Oropharynx

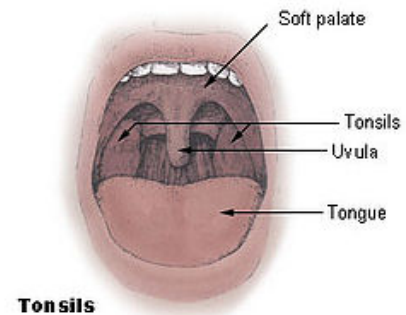
Opens anteriorly to the mouth.

Above: soft palate.

Below: the upper border of epiglottis.

Palatine tonsils: between the anterior and posterior pillars.

Valleculae: Is a depression on each side of the median glossoepiglottic. It is the area between the epiglottis and base of the tongue.



3. Laryngopharynx (Hypopharynx)

Opens **anteriorly** to the larynx

Above: the upper border of the epiglottis

Below: lower border of cricoid

Pyramidal fossa: (Is a depression in the mucous membrane on each side of the laryngeal inlet).

- When the patient presents with halitosis, check the oral hygiene and make sure that the patient is cleaning the tongue, and exclude other causes like reflux and diverticula.

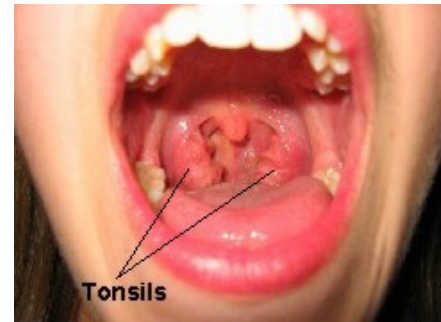
Structures of the Pharynx

Fibromuscular tube consists of four layers:

1. Mucous membrane:
2. Ciliated epithelium
3. Stratified squamous epithelium
4. Transitional epithelium
5. Subepithelial lymphoid tissue of the pharynx (**waldeyer's ring**).

Palatine tonsils:

- 12-15 crypts.
- The deep surface is separated from the constrictor muscles of the pharynx by connective tissue (**capsule**).
- When tonsillectomy is performed you have to make the incision in the connective tissue, if the surgeon goes more medially he will enter the tonsils, if more lateral he will enter the muscles.



Adenoid:

Is common in children and it is diminished in size with growing, only big adenoid is removed, the mother is noticing her baby choking while he is sleeping and moving and nocturnal enuresis)

- ✓ No capsule
- ✓ Lingual tonsils
- ✓ Tubal tonsils
- ✓ Lateral pharyngeal bands
- ✓ discrete nodules

Pharyngeal aponeurosis:

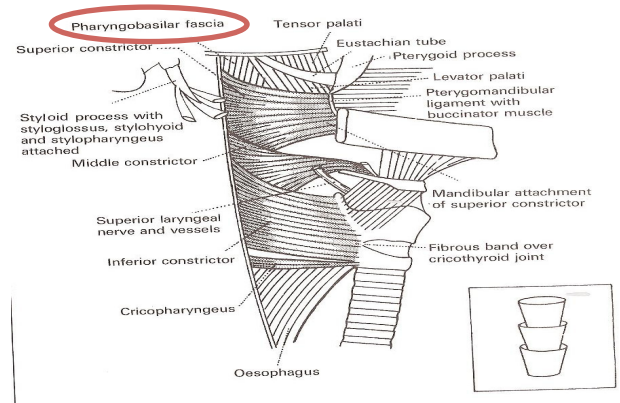
Incomplete connective tissue coat in the lateral and posterior walls of the pharynx between the muscular layers.

Pharyngobasilar fascia:

- Muscular coat

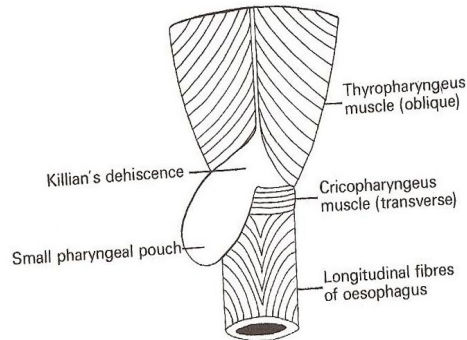
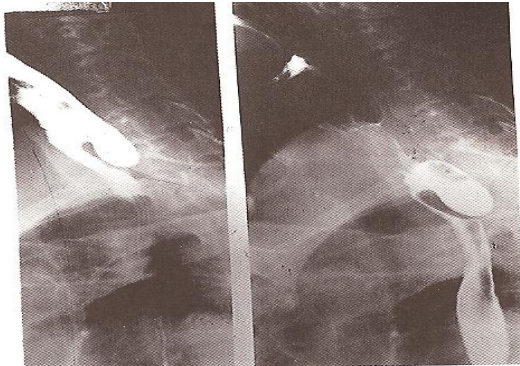
- External: Three constrictor muscles:

1. **Superior constrictor:** Arises from pterygoid, pterygomandibular ligament post end of mylohyoid fibers
2. **Middle constrictor:** Arises from the hyoid bone and stylohyoid ligament.
3. **Inferior constrictor:** Thyropharyngeus, Cricopharyngeus.



Killian's dehiscence:

Potential gap between the thyropharyngeus and cricopharyngeus (**Zenker's diverticulum occurs in this weak area and diagnosed by barium swallow**)

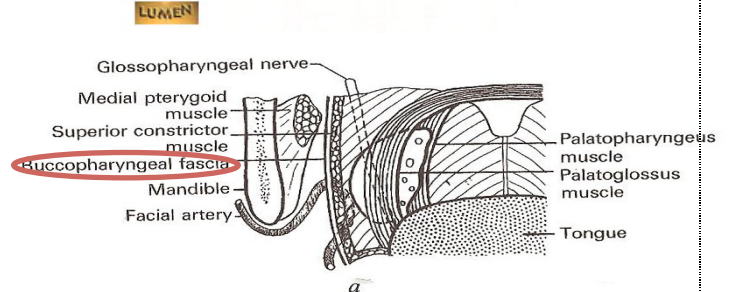


- Internal: Three muscles:

1. Stylopharyngus
2. Salpingopharyngus
3. palatopharyngus



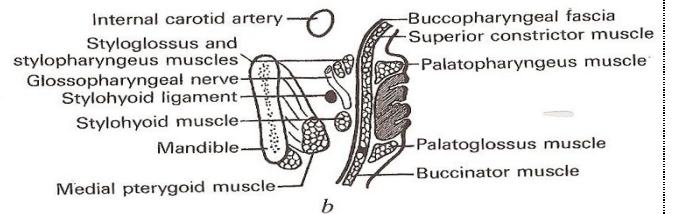
Buccopharyngeal fascia (thin layer covers the muscular layer of pharyngeal wall)



Relations of pharynx:

Posteriorly: prevertebral fascia

Anteriorly: Parapharyngeal space



Parapharyngeal Space:

Potential space lies outside the pharynx.

Triangular in cross section, it extends from the base of the skull above to the superior mediastinum and apex of hyoid bone.

- **Anteromedial wall:** Buccopharyngeal fascia
- **Posteromedial wall:** Cervical vertebrae, prevertebral muscle and fascia
- **Lateral wall:**
 - (Up) the mandible, pterygoid muscle, parotid gland
 - (Lower) Sternomastoid muscle

Compartment:

- Prestyloid: (internal maxillary artery, fat, inferior alveolar, lingual, and auriculotemporal nerves.)

- Poststyloid: (if the patient has tonsillitis and on examination there is bulge in lateral pharyngeal wall, on CT there is postsyloid abscess so I have to do incision and drainage since this is a dangerous area, they could have carotid rupture)

- Neurovascular bundle (carotid artery, IJV, sympathetic chain, CN IX, X and, XI)

Retropharyngeal Space: It extends from the base of skull to superior mediastinum

Lies behind the pharynx

- ✓ **Anterior:** posterior pharyngeal wall and its covering buccopharyngeal fascia.
- ✓ **Posterior:** cervical vertebrae and muscles and fascia.
- ✓ **Contents:** Retropharyngeal lymph nodes.

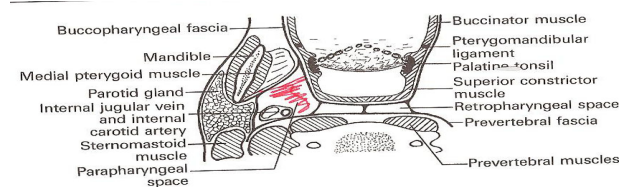
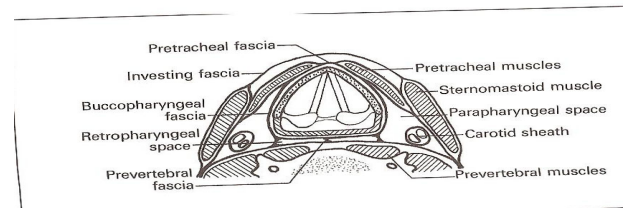


Figure 11.6 Fascial compartments of neck at level of C2



(If a child has tonsillitis and on examination you found a bulge in the posterior wall (in front of you) you do CT scan it is abscess, but if he is adult but without any acute infection, you think about TB).

Physiology of the Pharynx

Functions of the sub epithelial lymphoid tissue: (protective functions)

- Formation of lymphocytes
- Formation of antibodies
- Acquisition of immunity
- Localization of infection

Salivation

Deglutition: (Three stages)

- **Oral stage:** voluntary, closure of mouth, cessation of respiration, raising of larynx, sudden elevation of the tongue, press the tongue against the palate, and pushes it backwards towards the oropharynx
- **Pharyngeal stage:** reflex, contraction of nasopharynx sphincter, larynx rises more, laryngeal inlet closure, epiglottis diverts the food into cricopharyngeal sphincter, contraction of constrictor muscles, relaxed cricopharyngeal sphincter.
- **Respiration**
- **Speech**
- **Resonating cavity**
- **Articulation**
- **Taste:** taste buds

Summary

- The pharynx is situated behind the nasal cavities, the mouth and the larynx.
- It is divided into nasal, oral and laryngeal parts
- It extends from base of the skull into the 6 cervical vertebra
- It is fibromuscular structure which is covered by mucus membrane and 4 layers and lymphatic tissue called **(Waldeyer's ring)**
- It has 3 external muscles and 3 internal muscles
- Killian's dehiscence is the weakest area where Zenker's diverticulum occur
- Para and retropharyngeal spaces are important for their relations to the pharynx and infection and abscess formation
- Function of the lymphatic tissue in the pharynx for protection by formation lymphocytes and antibodies
- Function of pharynx is salivation, Deglutition, respiration, speech, resonating cavity, articulation and taste.

MCQs:

Q1. Structures passing between upper border of superior constrictor muscle and base of skull include all except?

- a. Levator palatini
- b. Tensor tympani
- c. Eustachian tube
- d. Ascending palatine artery

Q2. All of the following statements about Zenker's diverticulum are correct except?

- a. Arises from posterior part of hypopharynx
- b. Is a traction diverticulum
- c. Causes regurgitation of undigested food
- d. Treated by diverticulectomy and cricopharyngeal myotomy

Q3. Characteristic features of submucous cleft palate include all except?

- a. Bifid uvula
- b. Notch of posterior border of hard palate
- c. Deficient palatal muscles
- d. Common association with cleft lip

Q4. All of the following cause a grey-white membrane on the tonsils except?

- a. Infectious mononucleosis
- b. Ludwig's angina
- c. Streptococcal tonsillitis
- d. Diphtheria

For mistakes or feedback

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Answers

- 1. B
- 2. C
- 3. D
- 4. B