SURGICAL ANATOMY
PHARYNX

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SURGICAL ANATOMY
PHARYNX

- Introduction
- Sites
- Histology
- Anatomy
- Applied anatomy
The pharynx is situated behind the nasal cavities, the mouth, and the larynx.

It may be divided into nasal, oral, and laryngeal parts.

Its upper, wider end lying under the skull.

Its lower, narrow end becoming continuous with the oesophagus opposite the sixth cervical vertebra.
ANATOMY SITES

- Nasopharynx
- Oropharynx
- Hypopharynx
It is a musculo-membranous wall, composed of:
- Mucosa & submucosa.
- Pharyngobasilar fascia.
- Muscles: circular & longitudinal.
- Buccopharyngeal fascia (middle layer of deep cervical fascia).
• Mucosa :

➤ Epithelium :
  ➤ Stratified squamous epithelium
  ➤ pseudostratified ciliated columnar with goblet cells (pharyngeal tonsil i.e adenoid)

➤ Lamina propria :
  ➤ Minor salivary gland
  ➤ Lymphoid tissue (adenoid, tonsil)
ANATOMY
NASOPHARYNX
BOUNDARIES

- Anterior: **nasal cavity** at the choanae
- Inferior: **oropharynx** at the lower border of the soft palate.
- Superior: **body of sphenoid** & basal part of the occipital bone, contain adenoid.
- Posterior: supported by anterior arch of atlas (C1).
ANATOMY NASOPHARYNX LATERAL WALL

- Opening of auditory tube
- Tubal elevation (produced by posterior margin of tube)
- Pharyngeal recess
- Tubal tonsil
- Salpingopharyngeal fold (raised by salpingo-pharyngeus muscle)
- Nerve supply:
  Maxillary division of trigeminal (CNV)
ANATOMY NASOPHARYNX
SUBSITES

- Posterior wall
- Lateral wall
- Soft palate

Landmarks:
- Eustachian tube. (Serous otitis media, adenoid hypertrophy).
- The fossa of Rosenmuller,
  (most common site of NP carcinoma)
ANATOMY NASOPHARYNX
SUBSITES

Eustachian tube

fossa of Rosenmuller
ANATOMY
OROPHARYNX

• Extends from soft palate to upper border of epiglottis.
ANATOMY OROPHARYNX
BOUNDARIES

- Anterior wall: opening of the oral cavity.
- Posterior wall: supported by body of C2 and upper part of body of C3 vertebra.
- Superior: soft palate and pharyngeal isthmus.
ANATOMY OROPHARYNX
BOUNDARIES

• Inferior:
  ➢ Posterior one third of tongue.
  ➢ Median & lateral glossoepiglottic folds.
  ➢ Valleculae.
ANATOMY OROPHARYNX
BOUNDARIES

• Lateral wall

  ➢ Palatopharyngeal folds.
  ➢ Palatoglossal folds.
  ➢ Palatine tonsil.
ANATOMY OROPHARYNX
SUBSITES

- Soft Palate.
- Tongue base
- Tonsil:
  - Tonsillar hypertrophy
  - Most common site of oropharyngeal Carcinoma.
- Lateral Pharyngeal Wall.
- Posterior Pharyngeal Wall.

Nerve supply: glossopharyngeal (CN IX).
OROPHARYNX
PALATINE TONSIL

- Subepithelial lymphoid tissue.
- Located in the palatine fossa, in the lateral wall of the oropharynx.
- Reaches its maximum size during early childhood, but after puberty diminishes in size.
- Lateral surface: covered by a fibrous capsule. (peritonsillar space)
Palatine aponeurosis: skeleton where muscle inserted:

- Tensor veli palatine.
- Levator veli palatine.
- Uvular.
- Palatoglossus.
- Palatopharyngeal.

** cleft palate.
** nasal regurgitation & aspiration.
Oropharynx
Base of Tongue (BOT)

**Tongue muscles (extrinsic):**
- Palatoglossus.
- Styloglossus.
- Genioglossus.
- Hyoglossus.

**Deep invasion by tumor:**
- Tongue movement restriction
- Advanced tumor stage
OROPHARYNX
NERVE SUPPLY

• Palate muscles supplied by (CN IX & X)
  ➢ Tensor veli palatine (CN V3)

• Tongue muscles supplied by (CN XII)
  ➢ Palatoglossus (CN IX & X)

**Referred otalgia**
OROPHARYNX
BLOOD SUPPLY

ECA :

- Superior thyroid
- Lingual
- Occipital
- Facial
- Ascending pharyngeal
- Post auricular
- Internal maxillary
- Superficial temporal;
• Surgical ligation or embolization
  ➢ Post tonsillectomy bleeding

• Lymphatics
  ➢ (jugulodigastric node)
WALDEYER'S RING

• It is a lymphoid tissue ring located in the pharynx.

• Function as a barrier to infection especially in the first few years of life.

• Consists:
  - Adenoids (pharyngeal tonsils)
  - Tubal tonsil
  - Palatine tonsil
  - Lingual tonsil
### PHARYNX MUSCLES

- Superior, Middle & Inferior.

- Extend around the pharynx and are inserted posteriorly into a fibrous raphe that extends from the pharyngeal tubercle on the occipital bone to the esophagus.

- Propel the bolus of food down into the esophagus

**dysphagia**
**PHARYNX**
**INFERIOR CONSTRICCTOR MUSCLE**

- **Origin**: lamina of thyroid cartilage, cricoid cartilage
- **Insertion**: pharyngeal raphe

- **Cricopharyngeus** (lower fibers of the inferior constrictor)
  - act as a Upper esophageal sphincter.
  - preventing the entry of air into the esophagus between the acts of swallowing

**CP spasm, dysphagia**
PHARYNX
INFERIOR CONSTRICCTOR MUSCLE

• Area of weakness:
  Killian’s Triangle: Zenker’s Diverticulum
  ➢ dysphagia & aspiration in elderly
HYPOPHARYNX

- Extends from upper border of epiglottis to lower border of cricoid cartilage (C6).

- Narrowed to become esophagus.

- Nerve supply
  - Internal laryngeal branch (SLN) of the vagus nerve (CNX)
HYPOPHARYNX BOUNDARIES

• **Anterior:**
  - Opening of the larynx (upper part)
  - Mucosa covering the posterior surface of larynx (lower part)

• **Posterior:**
  - supported by bodies of C3, 4, 5, 6 vertebrae
HYPOPHARYNX
BOUNDARIES

• Lateral wall:

  ➢ Thyroid cartilage and thyrohoid membrane.

  ➢ The piriform fossae
HYPOPHARYNX SUBSITES

- Pyriform Sinus:
- Posterior Pharyngeal Wall
- Postcricoid Region.
HYPOPHARYNX
PIRIFORM SINUS

• Most common site for hypopharyngeal cancer.
• Most common site of FB impaction (hypopharynx).
• Hypopharyngeal Lesion
  - Vocal cord paralysis (CA joint involvement)
  - Pooling of secretion proximally.
  - Referred otolagia (CNX involvement).
SWALLOWING
PHARYNGEAL PHASES

• Reflexive phase
  ➢ (posterior pharyngeal wall receptors, CN IX and CN X)

• Transient time <1 sec in normal subjects
SWALLOWING
NASOPHARATEAL PHASE

- Levator veli palatini
  - Lifts the soft palate

- Palatopharyngeous
  - Tightens and raises the pharynx and narrows the oropharyngeal inlet.

- Superior pharyngeal muscle contraction
SWALLOWING
OROPHARYNGEAL PHASE

• Base of Tongue Propels Bolus Past Vallecula
  ➢ squeezes against posterior pharynx
**Glossectomy patients have difficulty with bolus propulsion**
CONCLUSION

• The pharynx has complicated anatomy to optimize physiology & function.
• Each site & subsites have its own function.
• Missing site or subsites will compromise the function leading to aspiration, dysphagia, speech impairment.
• Understanding surgical anatomy will lead to delectated surgical dissection.
Thank you