SURGICAL ANATOMY OF THE THROAT
Mouth

1- vestibule
2- mouth proper
lined by strat.sq epithelium and contains numerous salivary glands.

Salivary glands divided into:
1-small
2-large: 3 pairs; paroted, submandibular and sublingual
PHARYNX
The pharynx is situated behind the nasal cavities, the mouth, and the larynx. It is divided into nasal, oral, and laryngeal parts. Its upper part is wider and lies under the skull. Its lower end is narrow and continues with the esophagus opposite the sixth cervical vertebra.
Is a fibro-muscular tube, funnel shaped being broadest in its upper part, its lower end continues with the esophagus (narrowest part of the digestive tract).
PHARYNX

1- nasopharynx
2- oropharynx
3- laryngopharynx(hypopharynx)
Consists of four layers:
1- **Mucous membrane**: contains
   a- Epithelium
   b- Subepith.lymphoid tissues: Waldeyers ring (palatine, nasopharyngeal, tubal and lingual tonsils)
2- **Apponeurosis**: (pharyngobasilar fascia)
3- **Muscular coat**: external and internal layers
a- external : 3 constrictors (sup., middle and inf.)
b- internal : stylopharyngeus, palatopharyngeus and salpingopharyngeus

4- Buccopharyngeal fascia
Blood supply: External carotid a.

Nerve supply: motor (accessory n.)
   Sensory: by 5th, 9th and 10th cranial nerves.

Lyphatic drainage: deep jugular nodes.
Nasopharynx

- This lies above the soft palate and behind the nasal cavities

- In the submucosa of the roof is a collection of lymphoid tissue called the nasopharyngeal tonsil

- The pharyngeal isthmus is the opening in the floor between the soft palate and the posterior pharyngeal wall

- On the lateral wall is the opening of the auditory tube, the elevated ridge of which is called the tubal elevation
Pharyngeal recess (fossa of Rosen-muller) is a depression behind the tubal elevation in the lateral wall of the nasopharynx. It is the commonest site of a hidden tumor in the head and neck.
This lies behind the oral cavity

The floor is formed by the posterior one third of the tongue and the interval between the tongue and epiglottis.

The tongue and epiglottis are connected by 3 mucosal folds, one median and two lateral glossoepiglottic folds.

The depression on each side of the median glossoepiglottic fold is called the vallecula.
Medial Sagittal View

- Pharyngeal opening of auditory (Eustachian) tube
- Torus tubarius
- Sphenoidal sinus
- Pharyngeal tonsil
- Pharyngeal tubercle (basilar part of occipital bone)
- Pharyngobasilar fascia
- Pharyngeal recess
- Salpingopharyngeal fold
- Uvula
- Oropharynx
- Palatopharyngeal arch
- Palatine tonsil
- Epiglottis
- Triangle
- Uvula
- Palatine tonsil
- Valvula
- Lingual tonsil
On the lateral wall on each side are the palatoglossal and the palatopharyngeal arches or folds and the palatine tonsils between them.

The palatoglossal arch is a fold of mucous membrane covering the palatoglossus muscle.

The interval between the two palatoglossal arches is called the oropharyngeal isthmus.

It marks the boundary between the mouth and pharynx.
The palatopharyngeal arch is a fold of mucous membrane covering the palatopharyngeus muscle.

The recess between the palatoglossal and palatopharyngeal arches is occupied by the palatine tonsil.
This lies behind the opening into the larynx

The lateral wall is formed by the thyroid cartilage and the thyrohyoid membrane. It consists of 2 pyriform sinuses (fossae), postcricoid region and posterior pharyngeal wall.

The pyriform fossa is a depression in the mucous membrane on each side of the laryngeal inlet
Nerve supply

Nasal pharynx: The maxillary nerve

Oral pharynx: The glossopharyngeal nerve

Laryngeal pharynx: The internal laryngeal branch of the vagus nerve
Blood Supply

- Ascending pharyngeal, tonsillar branch of facial artery, and branches of maxillary and lingual arteries (branches of external carotid artery)
Lymph Drainage

- Directly into the deep cervical lymph nodes or indirectly via the retropharyngeal or paratracheal nodes into the deep cervical nodes
The Larynx

• The larynx is the **portion of the respiratory tract** containing the vocal cords

• A 2-inch-long, tube-shaped organ, opens into the **laryngeal part of the pharynx** above and is continuous with the **trachea** below
The Larynx: Important Relations

• The larynx related to major critical structures:
  ▪ Carotid arteries, jugular veins, and vagus nerve
  ▪ Superior and inferior thyroid arteries
  ▪ Superior and recurrent laryngeal nerves
The larynx consists of four basic components:

- A cartilaginous skeleton
- Membranes and ligaments
- Intrinsic and extrinsic muscles
- Mucosal lining
The cartilaginous skeleton is comprised of:

- **Single Cartilages:**
  - Thyroid
  - Cricoid
  - Epiglottis

- **Paired Cartilages:**
  - Arytenoid
  - Corniculate
  - Cuneiform
• All the cartilages, except the epiglottis, are of **hyaline** type.
• Epiglottis is formed of **elastic** cartilage
• The cartilages are:
  - Connected by **joints**, **membranes** & **ligaments**
  - Moved by **muscles**
Thyroid Cartilage

- Has two laminae, which meet in the midline and form a prominent angle, called laryngeal prominence (Adam’s apple) and the superior thyroid notch at the rostral margin of the
- The posterior border of each lamina forms superior & inferior cornu (horns)
- Outer surface of each lamina shows an oblique line which gives attachment to thyrohyoid, sternothyroid & inferior constrictor of the pharynx
- The superior border gives attachment to the thyrohyoid membrane
Cricoid Cartilage

- Lies below the thyroid cartilage
- Forms a complete ring
- Has a narrow anterior arch & a broad posterior lamina
- Has an articular facet on its:
  - Lateral surface for articulation with inferior cornu of the thyroid cartilage (a synovial joint)
  - Upper border for articulation with base of arytenoid cartilage (a synovial joint)
Arytenoid Cartilages

- Small, pyramidal in shape
- Situated at the back of the larynx

Has:
- A base articulating with the upper border of the cricoid cartilage
- An apex supporting the corniculate cartilage
- A vocal process projecting forward, gives attachment to the vocal ligament
- A muscular process projecting laterally, gives attachment to muscles
Corniculate & Cuneiform Cartilages

Corniculate Cartilages
- Small nodules
- Articulate with the apices of arytenoid cartilages

Cuneiform Cartilages
- Small rod shaped, placed in each aryepiglottic fold, producing a small elevation
- Do not articulate with any other cartilage

Serve as support for the aryepiglottic fold
Epiglottis

- Leaf shaped, situated behind the root of the tongue
- Connected:
  - In front to the body of hyoid bone by the hyoepiglottic ligament
  - By its stalk to the back of thyroid cartilage by the thyroepiglottic ligament
- Upper edge is free.
- Laterally gives attachment to aryepiglottic fold
- Anteriorly mucosa is reflected onto the tongue forming three glossoepiglottic folds & valleculae
Membranes & Ligaments

- Thyrohoid membrane, median & lateral thyrohoid ligaments
- Median cricothyroid ligament
- Cricotracheal membrane
- Hyoepiglottic ligament
- Thyroepiglottic ligament
• **Quadrangular membrane:**
  - Extends between the epiglottis and the arytenoid cartilages
  - Its lower free margin forms the **vestibular ligament** that lies within the vestibular fold

• **Cricothyroid membrane (conus elasticus):**
  - Lower margin is attached to upper border of cricoid cartilage
  - Upper free margin forms **vocal ligament** that is attached anteriorly to deep surface of thyroid cartilage & posteriorly to the vocal process of arytenoid cartilage
Laryngeal Cavity

- Extends from laryngeal inlet to lower border of the cricoid cartilage
- Narrow in the region of the vestibular folds (rima vestibuli)
- Narrowest in the region of the vocal folds (rima glottidis)
Laryngeal Cavity cont’d

- Divided into three parts:
  A. Supraglottic part, the part above the true vocal cords
  B. Glottis: The true vocal cords
  C. Subglottic part, the part below the true vocal cords.
Mucous Membrane

- The cavity is lined with ciliated columnar epithelium
- The surface of vocal folds, because of exposure to continuous trauma during phonation, is covered with stratified squamous epithelium
- Contains many mucous glands, more numerous in the saccule (for lubrication of vocal folds)

Muscles

Divided into two groups:

- **Extrinsic muscles**: divided into two groups
  - Elevators of the larynx
  - Depressors of the larynx
- **Intrinsic muscles**: divided into two groups
  - Muscles controlling the laryngeal inlet
  - Muscles controlling the movements of the vocal cords
• The Suprahyoid Muscles
   Digastric
   Stylohyoid
   Mylohyoid
   Geniohyoid

• The Longitudinal Muscles of the Pharynx
   Stylopharyngeus
   Salpingopharyngeus
   Palatopharyngeus

Depressors of the Pharynx:

• The Infrahyoid Muscles
   Sternohyoid
   Sternothyroid
   Omohyoid
Muscles Controlling the Laryngeal Inlet

- Oblique arytenoid
- Aryepiglottic muscle
Muscle Increasing the Length & Tension of the Vocal Cords

- **Cricothyroid**: increases the distance between the angle of the thyroid cartilage & the vocal processes of the arytenoid cartilages, and results in increase in the length & tension of the vocal cords.
Muscle decreasing the Length & Tension of Vocal Cords

- Thyroarytenoid (vocalis): pulls the arytenoid cartilage forward toward the thyroid cartilage and thus shortens and relaxes the vocal cords.
Movements of the Vocal Cords

- Adduction
- Abduction

Folds closed (adducted)        Folds open (abducted)       
(View from above)

Glottis (space between folds)
Adductors of the Vocal Cords

- Lateral cricoarytenoid
- Transverse arytenoid
Abductor of the Vocal Cords

• Posterior cricoarytenoid
Blood Supply & Lymph Drainage

- **Arteries:**
  - **Upper half:** Superior laryngeal artery, branch of superior thyroid artery
  - **Lower half:** Inferior laryngeal artery, branch of inferior thyroid artery

- **Veins:**
  - Accompany the corresponding arteries

- **Lymphatics:**
  - The lymph vessels drain into the deep cervical lymph nodes
Nerve Supply

• Sensory
  ▪ Above the vocal cords: Internal laryngeal nerve, branch of the superior laryngeal branch of the vagus nerve
  ▪ Below the vocal cords: Recurrent laryngeal nerve, branch of the vagus nerve

• Motor
  ▪ All intrinsic muscles, except cricothyroid, supplied by the recurrent laryngeal nerve
  ▪ The cricothyroid muscle is supplied by the external laryngeal nerve, a branch of the superior laryngeal branch of vagus nerve
Functions of larynx

1- protection of lower air passages
2- phonation
3- respiration
4- fixation if the chest
THANX