

Anatomy and physiology of the larynx

Anatomy of the larynx:-

- **The larynx is situated in the midline of the neck at the meeting of the of the digestive and the respiratory passages .**
- **it lies in front of the laryngopharynx from the level of the third to the sixth cervical vertebrae.**

- it consists of a framework of cartilages connected by ligaments and membranes , lined by mucus membrane and moved by muscles .
- the male larynx increases in size at puberty .all the cartilages enlarge and the projection of the thyroid cartilage produces the Adam apple.

Laryngeal cartilages:-

- Form the main framework of the larynx,
- they are divided into two groups:

1-unpaired cartilages:

a-thyroid cartilage: the largest one and consist of two halves each one consist of:

- . ala(lamina): it begin to ossify by age of 25 and may be completely ossified by age of 65,**

- . superior cornu,**

b- the cricoid cartilage: resemble signet ring, narrow in front and broad behind. it consist of :

- . lamina: posteriorly,**

- . arch: anteriorly ,**

- . cartilage of the epiglottis.**

- . and the inferior cornu.**

2-paired cartilages:

a-arytenoid cartilages.

b-corniculate cartilages: the cartilages of santorini.

c-cuneiform cartilages.

Laryngeal joints:-

- **the two important joints on each side are:**

1-cricothyroid joint.

2-crico-arytenoid joint.

Laryngeal ligaments and membranes:-

- **these are of two types:**

1-intrinsic: uniting the cartilages of the larynx to one another:

a-the ventricular ligament.

b- the conus elasticus.

c-the thyro-epiglottic ligament.

d-the median cricothyroid ligament.

e-the vocal ligament.

2-extrinsic:- uniting the cartilages of the larynx to the skeletal structures outside the larynx:

a-thyro-hyoid membrane.

b-median thyro-hyoid ligament.

c-lateral thyro-hyoid ligament.

d-crico-tracheal membrane.

e-hyo-epiglottic ligament.

Laryngeal muscles:-

- these are of two types:

1- intrinsic : between one laryngeal cartilage and another:

a-abductors of the vocal cords.

b- adductors of the vocal cords.

c-tensors of the vocal cords.

d-opener of the laryngeal inlet.

e-closers of the laryngeal inlet.

2-extrinsic: between the larynx and the neighboring structures:

a-strap muscles.

b-pharyngeal muscles.

Cavity of the larynx:-

- **extend from the inlet of the larynx to the lower border of the cricoid cartilage, where it is continuous with the trachea. It is divided into three parts by two folds of mucous membrane:**

1-the false vocal cords.

2- the true vocal cords.

- **The three parts of the cavity are :**

1-the vestibule.

2- the ventricle of the larynx.

3-the subglottic space.

Blood supply of the larynx:-

- 1-laryngeal branches of the superior thyroid artery.
- 2--laryngeal branches of the inferior thyroid artery: accompany the recurrent laryngeal nerve.
- 3-cricothyroid branches of the superior thyroid artery.
 - The veins accompany the arteries.

Nerve supply of the larynx:-

- The larynx is supplied by branches of the vagus nerve.

1-the superior laryngeal nerve: has two laryngeal branches:

a-internal branch: entirely sensory, it passes with the superior laryngeal artery and vein, it supplies the cavity of the larynx as far down as the level of the vocal cords.

b-external branch: it is motor, supplies the cricothyroid muscle.

2-the inferior

(recurrent)laryngeal nerve:

has a much longer course on the left side than the right

side, on the left side it turns

around the arch of the aorta

, on the right side it turns

around the subclavian

artery,

. in the neck it lies between the esophagus and the trachea , it passes with the inferior thyroid artery and vein.

it has two branches:

a-motor branch : supplies all intrinsic muscles except the cricothyroid muscle , no fibers cross the mid line.

b-sensory branch: supplies the cavity of the larynx below the level of the vocal cords.

Lymphatic drainage of the larynx:-

- **The edges of the vocal cords divide the lymphatic system of the larynx into two parts:**

1-supraglottic : above the vocal cords ,drain into :

- **a-pre-epiglottic nodes.**
- **b-upper deep cervical nodes.**

2-sub-glottic:” below the vocal cords, drain in to:

- **a-pre-laryngeal and pre-tracheal nodes.**

- **b-lower deep cervical nodes.**

Functions of the larynx:-

1-protection of the lower air passages: the most important function, involves several mechanisms:

- **a-closure of the laryngeal inlet.**
- **b-closure of the epiglottis.**
- **c-cessation of respiration.**
- **d-cough reflex.**

2-phonation.

3-respiration.

4-fixation of the chest.

