

LARYNX

DISCUSS THE LARYNX UNDER THE FOLLOWING HEADING(LE)

A) MUSCLES B) NERVE SUPPLY C) INTERIOR.

Larynx is the organ for production of voice and an air passage.

It is made up of cartilages muscles and ligaments that move the cartilages. It is lined by mucous membrane on its inner aspect.

The intrinsic muscles of larynx are:-

- Cricothyroid
- Posterior cricoarytenoid
- Lateral cricoarytenoid
- Transverse arytenoid
- Oblique arytenoid & Aryepiglotticus
- Thyroarytenoid & Thyroepiglotticus
- Vocalis

Cricothyroid

It is the only muscle which lies outside the larynx

Origin-

lower border and lateral surface of cricoid cartilage

Insertion-

inferior cornua and lower border of thyroid cartilage

Nerve supply -

external laryngeal nerve

Posterior cricoarytenoid

Origin-

posterior surface of lamina of cricoid cartilage

Insertion-

posterior aspect of muscular process of arytenoid cartilage

Nerve supply -

recurrent laryngeal nerve

Lateral cricoarytenoid

Origin-

lateral part of upper border of arch of cricoid cartilage

Insertion-

anterior aspect of muscular process of arytenoid

Nerve supply -

recurrent laryngeal nerve

Transverse arytenoids

Origin-

posterior surface of one arytenoid

Insertion-

posterior surface of another arytenoid

Nerve supply -

recurrent laryngeal nerve

Oblique arytenoids and Aryepiglotticus

Origin-

muscular process of one arytenoid

Insertion-

apex of opposite arytenoid. Some fibres continue into aryepiglottic fold to form aryepiglottic muscle

Nerve supply -

recurrent laryngeal nerve

Thyroarytenoid and thyroepiglotticus

Origin-

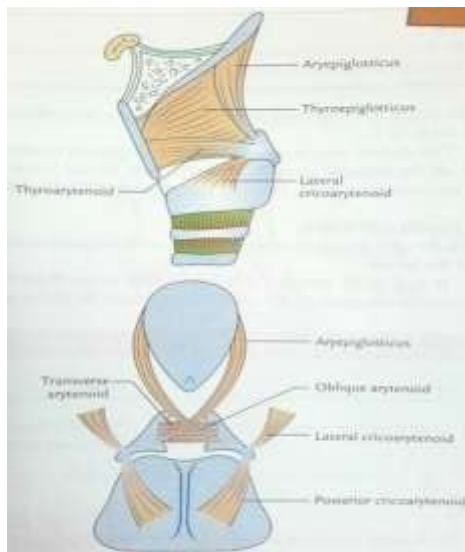
thyroid angle and cricothyroid ligament

Insertion-

anterolateral surface of arytenoid cartilage. Some fibers reach the aryepiglottic fold to form thyroepiglotticus.

Nerve supply -

recurrent laryngeal nerve



Intrinsic muscles of larynx

Nerve supply-

Motor -All the intrinsic muscles of larynx are supplied by recurrent laryngeal nerve except cricothyroid which is supplied by external laryngeal nerve

Sensory-

Above the level of vocal folds -

Internal laryngeal nerve(branch of superior laryngeal nerve)

Below the level of vocal folds-

Recurrent laryngeal nerve(branch of vagus nerve).

Interior of the larynx

Extent

Laryngeal cavity extends from the laryngeal inlet to the cricoid cartilage.

Subdivisions of interior of larynx

Vestibule (upper part)- extends from aryepiglottic fold to the vestibular folds.

Sinus of larynx (intermediate part) - intervenes between vestibular and vocal folds.

Infraglottic (Lower part) - Lies below the vocal folds.

Mucous folds of larynx

Aryepiglottic fold

Vestibular fold

Vocal fold

Aryepiglottic fold

Space between aryepiglottic folds is the inlet of larynx. The epiglottis and the inter arytenoids folds complete the inlet of larynx.

Vestibular fold

Space between vestibular folds is known as rima vestibuli.

It permits air entry in inspiration and prevents air exit in expiration.

Helps in holding the breath at the end of inspiration

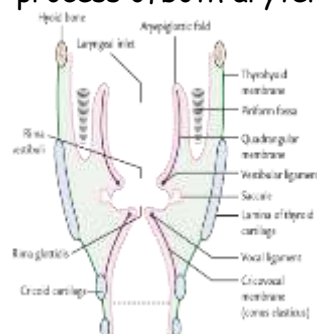
Vocal folds

Cleft between vocal folds and the vocal process of the arytenoids cartilage is known as Rima glottidis

It contains vocalis muscle and vocal ligament and covered by mucous membrane

It consists of 2 parts - Intermembranous part in the anterior $\frac{3}{5}$ th between vocal folds.

-Inter cartilagenous part in posterior $\frac{2}{5}$ th between vocal process of both arytenoid cartilages.



DESCRIBE INTRINSIC MUSCLES OF LARYNX (LE)

Larynx is the organ for production of voice and an air passage.

The intrinsic muscles of larynx are:-

Cricothyroid

Posterior cricoarytenoid

Lateral cricoarytenoid

Transverse arytenoid

Arytenoid & Aryepiglotticus

Thyroarytenoid & thyroepiglottic

Cricothyroid is the only muscle which lies outside the larynx

Origin- lower border and lateral surface of cricoid cartilage

Insertion- inferior cornua and lower border of thyroid cartilage

Nerve supply - external laryngeal nerve

Action- adducts and tenses the vocal cord

Posterior cricoarytenoid

Origin- posterior surface of lamina of cricoid cartilage

Insertion- posterior aspect of muscular process of arytenoid

Nerve supply - recurrent laryngeal nerve

Action- abducts the vocal cord

Lateral cricoarytenoid

Origin- lateral part of upper border of arch of cricoid cartilage

Insertion- anterior aspect of muscular process of arytenoid

Nerve supply - recurrent laryngeal nerve

Action- adducts the vocal cord

Transverse arytenoid

Origin- posterior surface of one arytenoid

Insertion- posterior surface of another arytenoid

Nerve supply - recurrent laryngeal nerve

- adducts the vocal cord

Oblique arytenoids and Aryepiglotticus

Origin- muscular process of one arytenoid

Insertion- apex of another arytenoids. Some fibres continue as aryepiglottic muscle

Nerve supply - recurrent laryngeal nerve

Action- oblique arytenoids - adducts the vocal cord

both oblique arytenoids and aryepiglotticus- close the inlet of larynx

Thyroarytenoid and Thyroepiglottic

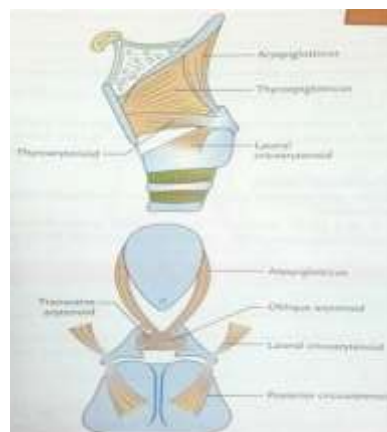
Origin- thyroid angle and cricothyroid ligament

Insertion- anterolateral surface of arytenoid cartilage. Some fibres project into the vocal fold as vocalis muscle. some fibres reach the aryepiglottic fold as thyroepiglotticus.

Nerve supply - recurrent laryngeal nerve

Action- thyroarytenoid -relaxes the vocal cord

thyroepiglottic- opens the inlet of larynx



NAME INTRINSIC MUSCLES OF LARYNX. GIVE ORIGIN INSERTION NERVE SUPPLY ACTIONS OF CRICOTHYROID MUSCLE. ADD A NOTE ON MOVEMENTS OF VOCAL CORDS(LE)

The intrinsic muscles of larynx are:-

- Cricothyroid
- Posterior cricoarytenoid
- Lateral cricoarytenoid
- Transverse arytenoid
- Oblique arytenoid & aryepiglotticus
- Thyroarytenoid & thyroepiglottic

Cricothyroid

is the only muscle which lies outside the larynx. It is a fan shaped muscle.

Origin- lower border and lateral surface of cricoid cartilage

Insertion- inferior cornu and lower border of thyroid cartilage

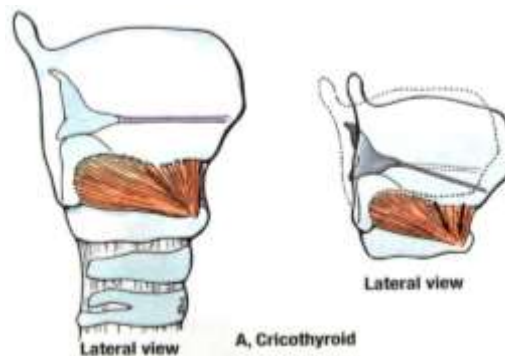
Nerve supply - external laryngeal nerve

Action-On contraction it tilts the thyroid cartilage downwards and forwards at cricothyroid joint.

It tenses and lengthens the vocal cord, and adducts the vocal cord.

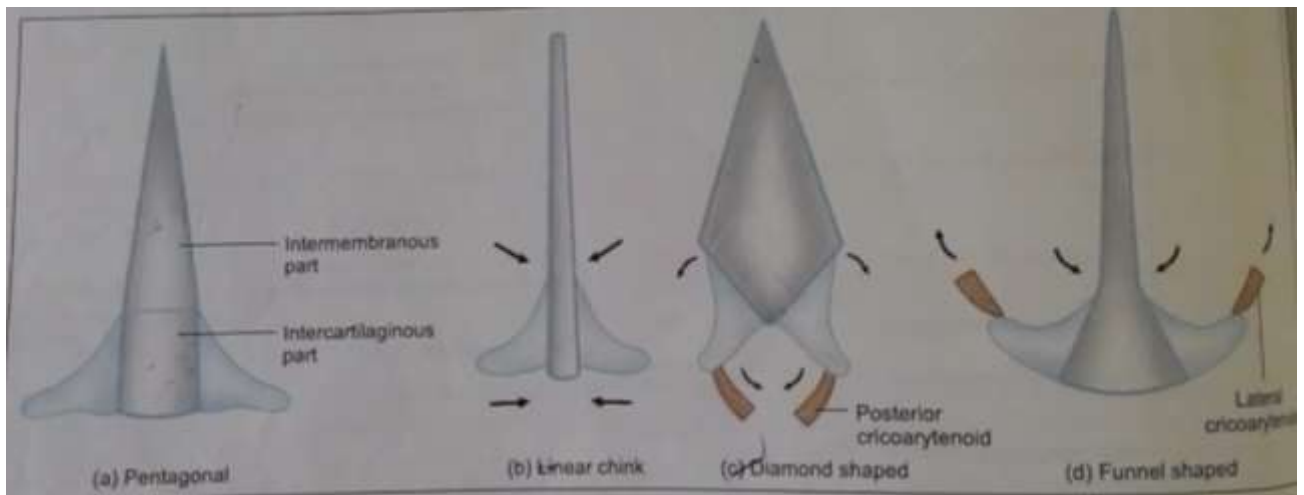
It is an important muscle for the tone and pitch of voice. Hence it is also known as tuning fork of larynx.

Paralysis of this muscle alters the voice significantly



Movements of vocal folds

- Quiet breathing
- Phonation
- Forced inspiration
- Whispering



Muscles acting on the vocal cords

abductor of vocal cord - posterior cricoarytenoid

adductor of vocal cord-lateral cricoarytenoid, transverse and oblique arytenoid

tensor of vocal cord- cricothyroid

Relaxor of vocal cord- thyroarytenoid

MUSCLES OF LARYNX: (SE)

Muscles of larynx are-Extrinsic and Intrinsic

Extrinsic muscles -

- Sternothyroid
- Thyrohyoid
- Palatopharyngeus
- Salpingopharyngeus
- Stylopharyngeus

Intrinsic muscles

- Cricothyroid
- Posterior cricoarytenoid
- Lateral cricoarytenoid
- Transverse arytenoid
- Oblique arytenoid & aryepiglotticus
- Thyroarytenoid & thyroepiglotticus

Nerve supply

All the intrinsic muscles are supplied by recurrent laryngeal nerve except Cricothyroid which is supplied by external laryngeal nerve.

Muscles acting on the larynx

<u>Movement</u>	<u>Muscles</u>
Elevation Of Larynx	Thyrohyoid , Mylohyoid
Depression Of Larynx	Sternothyroid , Sternohyoid
Opening The Inlet Of Larynx	Thyroepiglotticus
Closing The Inlet Of Larynx	Aryepiglotticus
Abductor Of Vocal Cord	Posterior Cricoarytenoid
Adductor Of Vocal Cord	Lateral cricoarytenoid, Transverse And Oblique Arytenoid
Tensor Of Vocal Cord	Cricothyroid
Relaxor Of Vocal Cord	Thyroarytenoid

CRICOTHYROID MUSCLE(SA)

Cricothyroid is the only muscle of the larynx which lies outside the larynx. It is a fan shaped muscle.

Origin- lower border and lateral surface of cricoid cartilage

Insertion- inferior cornu and lower border of thyroid cartilage

Nerve supply - external laryngeal nerve

Action-on contraction it tilts the thyroid cartilage downwards and forwards at cricothyroid joint.

It tenses and lengthens the vocal cord, and adducts the vocal cord

It is an important muscle for the tone and pitch of voice.hence it is also known as tuning fork of larynx.

Paralysis of this muscle alters the voice significantly

ENUMERATE ONLY INTRINSIC MUSCLES OF LARYNX(SA)

The intrinsic muscles of larynx are

Cricothyroid

Posterior cricoarytenoid

Lateral cricoarytenoid

Transverse arytenoid

Oblique arytenoid & aryepiglotticus

Thyroarytenoid & thyroepiglotticus

CRICOTHYROID MUSCLE-NERVE SUPPLY AND ACTION (SA)

Cricothyroid is the only muscle of the larynx which lies outside the larynx.

Nerve supply - external laryngeal nerve

Action-on contraction it tilts the thyroid cartilage downwards and forwards at cricothyroid joint.

It tenses and lengthens the vocal cord, and adducts the vocal cord

It is an important muscle for the tone and pitch of voice.Hence it is also known as tuning fork of larynx

POSTERIOR CRICOARYTENOID - NERVE SUPPLY AND ACTION / ABDUCTOR OF VOCAL CORDS (SA)

Posterior cricoarytenoid- is the only abductor of vocal cords.
it is a paired intrinsic muscle of larynx.
It is called safety muscle of larynx.

Origin- posterior surface of lamina of cricoid cartilage

Nerve supply - recurrent laryngeal nerve

Action- abducts the vocal cord.

LARYNX- NERVE SUPPLY (SENSORY) (SA)

Sensory nerve supply of larynx-

Above the level of vocal folds - Internal laryngeal nerve(branch of superior laryngeal nerve)

Below the level of vocal folds- Recurrent laryngeal nerve(branch of vagus nerve)

PYRIFORM FOSSA (SA)

It is a deep recess in the lateral part of laryngopharynx, on each side of laryngeal inlet.

Boundaries of pyriform fossa

Medial- Aryepiglottic fold and quadrangular membrane of larynx

Lateral- mucous membrane covering the lamina of thyroid cartilage and thyrohyoid membrane.

The floor of the fossa contains the internal laryngeal nerve and superior laryngeal vessels.