

FUNCTIONS OF VOCAL CORD

- RESPIRATION
- SPEECH
- PREVENTION OF ASPIRATION AND GENERATION OF COUGH

NERVE SUPPLY

MOTOR

- RECURRENT LARYNGEAL N.

SUPPLIES ALL MUSCLES EXCEPT
CRICOTHYROID

- CRICOTHYROID IS SUPPLIED BY
EXTERNAL LARYNGEAL

SENSORY



- ABOVE VOCAL CORD • BELOW VOCAL CORD
- INTERNAL LARYNGEAL N RECURRENT LARYNGEAL N

SUPERIOR LARYNGEAL NERVE

- IT ARISE FROM **INFERIOR GANGLION** OF VAGUS NERVE ,DESCENDS BEHIND INTERNAL CAROTID ARTERY,AND AT THE LEVEL OF **GREATER CORNUA** OF HYOID BONE DIVIDES IN TO EXTERNAL AND INTERNAL LARYNGEAL NERVE
- THE EXTERNAL BRANCH SUPPLIES CRICOTHYROID MUSCLE WHILE THE INTERNAL BRANCH PIERCE **THYROID MEMBRANE** AND PROVIDE THE SENSORY SUPPLY OF LARYNX AND HYPOPHARYNX

FirstRanker.com FirstRanker's choice **RECURRENT LARYNGEAL NERVE** www.FirstRanker.com www.FirstRanker.com

- **RT.RECURRENT LARYNGEAL N** ARISES FROM THE VAGUS N AT THE LEVEL OF **SUBCLAVIAN ARTERY** HOOKS ROUND IT AND ASCENDS BETWEEN THE ESOPHAGUS AND TRACHEA
- **LT.RECURRENT LARYNGEAL N** ARISES IN THE MEDIASTINUM AT THE LEVEL OF **ARCH OF AORTA** HOOKS ROUND IT AND ASCENDS UPWARD IN TO THE NECK IN THE TRACHEO ESOPHAGEAL GROOVE
- **LT.RECURRENT LARYNGEAL N** HAS A LONG COURSE HENCE **MORE PRONE TO PARALYSIS** AS COMPARED TO RIGHT

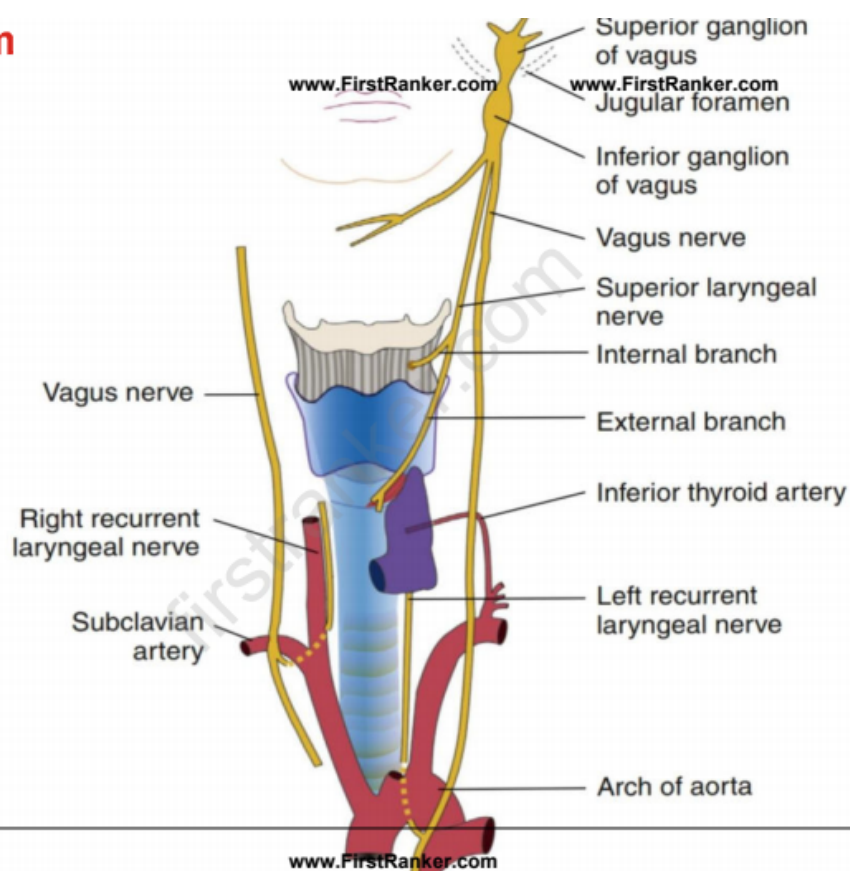


Figure 60.1 Recurrent and superior laryngeal nerves

ADDUCTION OF LARYNX



Action of transverse arytenoid muscle
Adduction of vocal ligaments

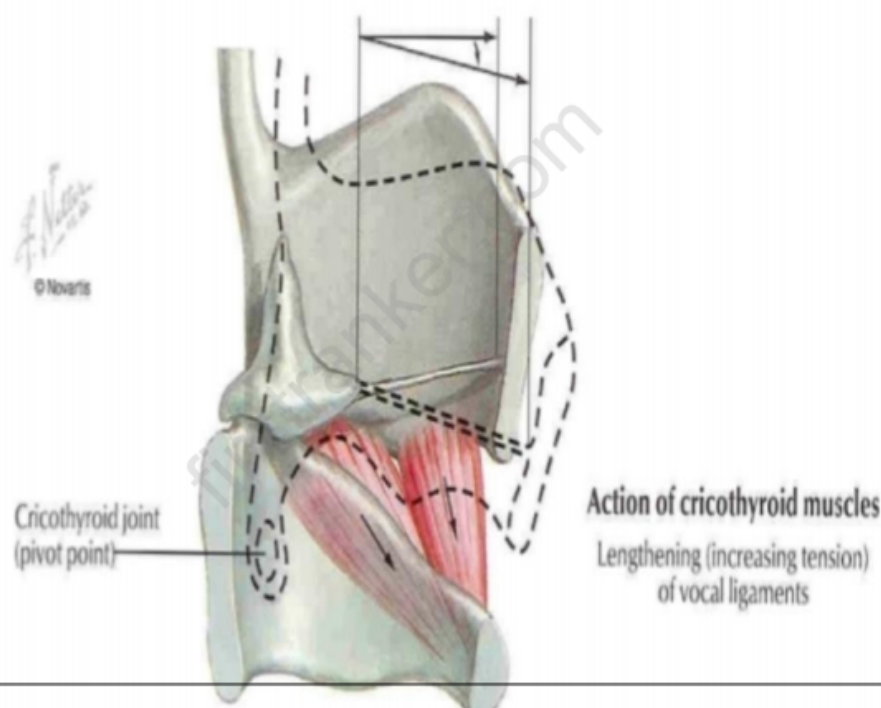


Action of vocalis and thyroarytenoid muscle
Shortening (relaxation) of vocal ligaments

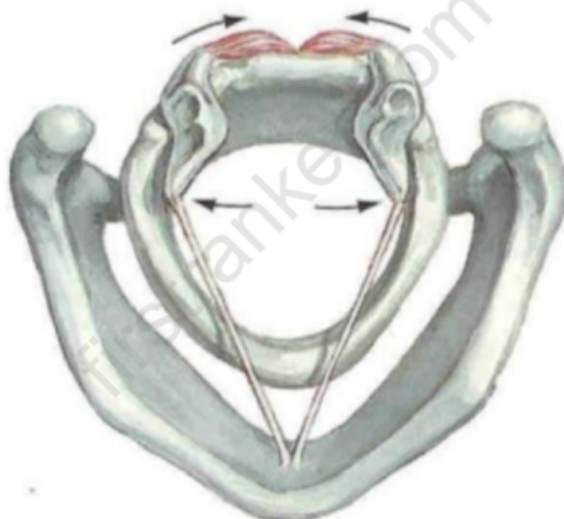


Action of lateral cricoarytenoid muscles
Adduction of vocal ligaments

ADDUCTION OF VOCAL CORDS



ABDUCTION OF LARYNX



Action of posterior cricoarytenoid muscles

Abduction of vocal ligaments

CAUSES OF LARYNGEAL PARALYSIS

- **SUPRANUCLEAR** RARE
- **NUCLEAR:** **NUCLEUS AMBIGUS** IN THE MEDULLA
VASCULAR, NEOPLASTIC, MOTOR NEURON DISEASE, POLIO AND SYRINGIOBULBIA
 - THERE WILL BE ASSOCIATED PARALYSIS OF **CN AND NEURAL PATHWAYS**
- **HIGH VAGAL LESION** – INTRACRANIALY – JUGULAR FORAMEN – PARAPHARYNGEAL SPACE
- **LOW VAGAL OR RECURRENT LARYNGEAL NERVE**
- **SYSTEMIC CAUSE** :DIABETES, SYPHILIS, DIPHThERIA, TYPHOID, STREPTOCOCCAL OR VIRAL INFECTION, LEAD POISONING

THEORIES ON POSITION OF VOCAL CORD IN VOCAL CORD PARALYSIS

- **SEMON'S LAW**: IN ALL PROGRESSIVE LESIONS, **ABDUCTOR** FIBRES OF NERVE, WHICH ARE PHYLOGENETICALLY NEWER, ARE MORE SUSCEPTIBLE AND FIRST TO BE PARALYSED COMPARED TO ADDUCTORS
- **WAGNER AND GROSSMAN HYPOTHESIS**: COMPLETE PARALYSIS OF RECURRENT LARYNGEAL NERVE VOCAL CORD WILL BE **PARAMEDIAN** DUE TO INTACT CRICOTHYROID (ADDUCTOR FUNCTION) WHEN SUPERIOR LARYNGEAL NERVE ALSO PARALYSED .. **CADAVERIC** POSITION

VOCAL CORD POSITION

Table 60.2 Position of the vocal cord in health and disease

Position of the cord	Location of the cord from midline	Situation in	
		Health	Disease
Median	Midline	Phonation	RLN paralysis
Paramedian	1.5 mm	Strong whisper	RLN paralysis
Intermediate (cadaveric)	3.5 mm. This is neutral position of cricoarytenoid joint. Abduction and adduction take place from this position	—	Paralysis of both recurrent and superior laryngeal nerves
Gentle abduction	7 mm	Quiet respiration	Paralysis of adductors
Full abduction	9.5 mm	Deep inspiration	—

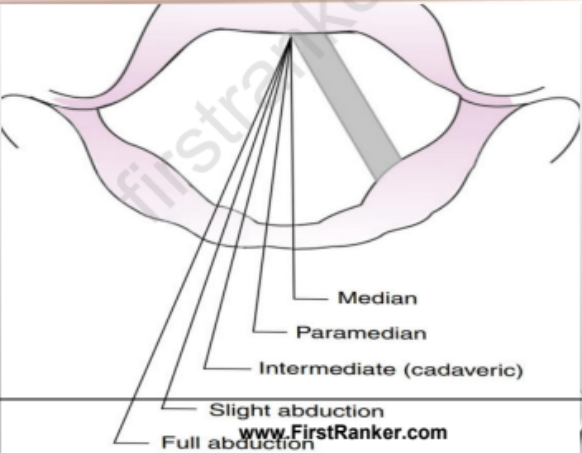


Figure 60.2 Position of vocal cords.

CLASSIFICATION OF LARYNGEAL PARALYSIS

- LARYNGEAL PARALYSIS MAY BE ~~UNILATERAL OR BILATERAL~~ AND MAY INVOLVE
 1. RECURRENT LARYNGEAL N
 2. SUPERIOR LARYNGEAL N
 3. COMBINED OR COMPLETE

A. UNILATERAL

IPSILATERAL PARALYSIS OF ALL INTRINSIC MUSCLES EXCEPT THE CRICOTHYROID

VOCAL CORD THUS ASSUMES MEDIAN OR PARAMEDIAN POSITION

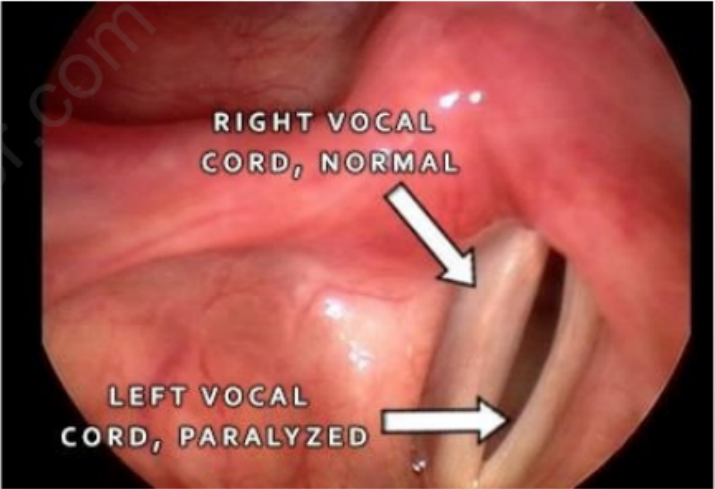
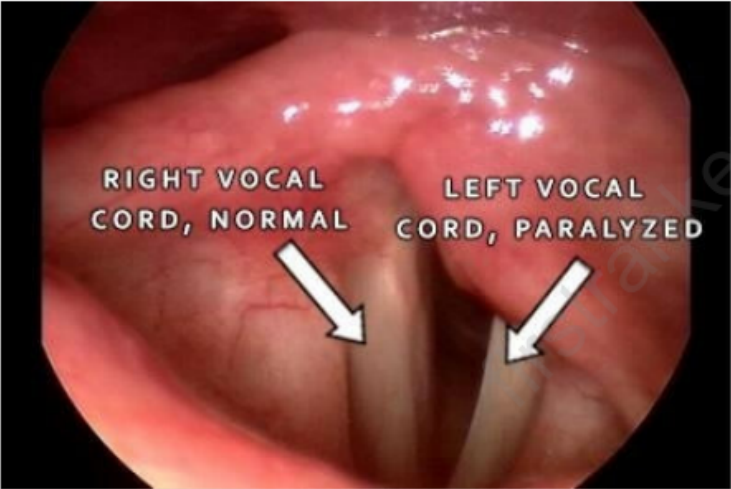
Table 60.3 Causes of recurrent laryngeal paralysis (low vagal trunk or recurrent laryngeal nerve)

Right	Left	Both
• Neck trauma • Benign or malignant thyroid disease • Thyroid surgery • Carcinoma cervical oesophagus • Cervical lymphadenopathy	I. Neck • Accidental trauma • Thyroid disease (benign or malignant) • Thyroid surgery • Carcinoma cervical oesophagus • Cervical lymphadenopathy II. Mediastinum • Bronchogenic cancer • Carcinoma thoracic oesophagus • Aortic aneurysm • Mediastinal lymphadenopathy • Enlarged left auricle • Intrathoracic • Idiopathic	• Thyroid surgery • Carcinoma thyroid • Cancer cervical oesophagus • Cervical lymphadenopathy

CLINICAL FEATURES

- ASYMPTOMATIC
- VOICE CHANGE
- NO ASPIRATION OR AIRWAY OBSTRUCTION

VOICE IMPROVES DUE TO **COMPENSATION** BY THE HEALTHY CORD WHICH CROSSES MIDLINE TO MEET PARALYSED ONE.



BILATERAL (BILATERAL ABDUCTOR PARALYSIS)

- **ETIOLOGY**

NEURITIS OR SURGICAL TRAUMA (THYROIDECTOMY)

- **POSITION OF CORD**

ALL THE INTRINSIC MUSCLES OF LARYNX ARE PARALYSED, THE VOCAL CORDS LIE IN **MEDIAN OR PARAMEDIAN** POSITION DUE TO UNOPPOSED ACTION OF CRICOTHYROID MUSCLES.

- **CLINICAL FEATURES:**

1. **DYSPNOEA** –AS BOTH CORDS LIE MEDIAN OR PARAMEDIAN .AIRWAY IS INADEQUATE

2. **STRIDOR**

BECOMES WORSE ON EXERTION OR AC LARYNGITIS



PARALYSIS OF SUPERIOR LARYNGEAL N

1. UNILATERAL (RARE

2. COMBINED(

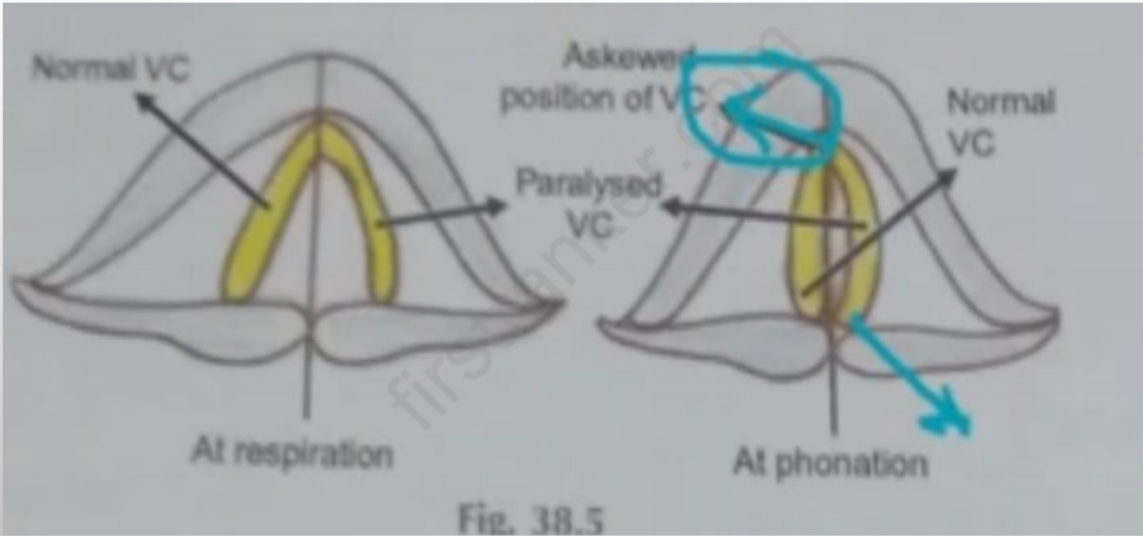
- PARALYSIS OF CRICOTHYROID MUSCLE AND IPSILATERAL ANAESTHESIA OF LARYNX ABOVE VOCAL CORD

• ETIOLOGY

1. THYROID SURGERY
2. THYROID TUMOR
3. DIPHTHERIA

CLINICAL FEATURES

- WEAK VOICE WITH DECREASE PITCH
- ANAESTHESIA OF LARYNX ON ONE SIDE
- ASPIRATION
- LARYNGEAL FINDINGS
 - **ASKEW POSITION** OF GLOTTIS AS ANT COMMISSURE IS ROTATED TO HEALTHY SIDE
 - **SHORTENING OF CORD** WITH LOSS OF TENSION(WAVY(
 - **FLAPPING OF PARALYSED CORD**



- UNCOMMON CONDITION
- BOTH **CRICOID MUSCLES** ARE **PARALYSED** WITH **ANAESTHESIA** OF UPPER LARYNX
- **ETIOLOGY**
 - SURGICAL OR ACCIDENTAL TRAUMA
 - DIPHTHERIA
 - PRESSURE BY CERVICAL NODES
 - NEOPLASTIC DISORDERS
- **CLINICAL FEATURES**
 - PARALYSIS AND BILATERAL ANAESTHESIA
 - COUGH
 - CHOKING FITS

COMBINED (COMPLETE) PARALYSIS

- RECURRENT LARYNGEAL AND SUPERIOR LARYNGEAL NERVE PARALYSIS

.1 UNILATERAL

- PARALYSIS OF ALL MUSCLES OF LARYNX ON ONE SIDE EXCEPT THE INTERARYTENOID WHICH RECEIVE INNERVATION FROM OPPOSITE SIDE

AETIOLOGY

- THYROID SURGERY
- LESIONS OF NUCLEUS AMBIGUS OR MEDULLA, POST CRANIAL FOSSA, JUGULAR FORAMEN, PARA PHARYNGEAL SPACE

CLINICAL FEATURES

- ALL MUSCLES OF LARYNX ON ONE SIDE IS **PARALYSED** (VOCAL CORD IN CADAVERIC POSITION)
- **GLOTTIC INCOMPETENCE** (HEALTHY CORD IS UNABLE TO APPROXIMATE THE PARALYSED CORD)
- HOARSENESS OF VOICE AND ASPIRATION OF LIQUID THROUGH GLOTTIS

Table 60.1 Causes of combined paralysis (high vagal lesions)

Intracranial	• Tumours of posterior fossa • Basal meningitis (tubercular)
Skull base	• Fractures • Nasopharyngeal cancer • Glomus tumour
Neck	• Penetrating injury • Parapharyngeal tumours • Metastatic nodes • Lymphoma

- BOTH **RECURRENT LARYNGEAL N AND SUPERIOR LARYNGEAL NERVE** ON BOTH SIDES
- RARE CONDITION
- CORDS LIE IN CADAVERIC POSITION
- TOTAL ANAESTHESIA OF LARYNX

CLINICAL FEATURES

- **APHONIA** AS CORDS DON'T MEET AT ALL
- **ASPIRATION**..INCOMPLETE GLOTTIS AND LARYNX ANAESTHESIA
- **INABILITY TO COUGH** INABILITY TO MEET.....:RETENTION OF SECRETIONS IN CHEST
- **BRONCHOPNEUMONIA**REPEATED ASPIRATION AND RETENTION OF SECRETION

CONGENITAL VOCAL CORD PALSY

- **UNILATERAL (MORE COMMON)**
 - BIRTH TRAUMA
 - CONGENITAL ANOMALY OF GREAT VESSEL OR HEART
- **BILATERAL**
 - HYDROCEPHALUS OR ARNOLD -CHIARI MALFORMATION
 - INTRACEREBRAL HEMORRHAGE DURING BIRTH
 - MENINGOCELE OR CEREBRAL OR NUCLEUS AMBIGUS AGENESIS