

### Congenital disease in larynx.

- (1) Congenital web
- (2) Laryngo Malacia (Congenital laryngo stridor)
- (3) Congenital sub Glottic stenosis.
- (4) Sub Glottic Hemangioma.
- (5) Laryngo Tracheal esophageal cleft
- (6) Congenital cyst.

### Laryngo Tracheo-esophageal cleft :-

- Hoarseness
- Stridor
- Aspiration
- chest infection.

	Congenital web	Laryngo Malacia.	Congenital subglottic stenosis.	Subglottic Hemangioma.	Congenital cyst.
def	Fibrous band between both vocal cord.	Abnormal softening of larynx that collapse during inspiration.	Congenital narrowing of subglottic area.	Congenital Hemangioma of subglottic area.	Congenital cyst at the ary-epiglottic fold.
Pathology		"Causes of obstruction" ① abnormal softening of laryngeal cartilage. ② omega shape Epiglottis (weak base) ③ Narrow subglottis ④ Redundant ary-epiglottic fold.			
Symptom	• Small web → Asymptomatic • Large web → (1) weak hoarse cry (2) stridor (inspiratory).	(1) Stridor (inspiratory). (2) No Hoarseness d2 → larynx normal during expiration → vocal cord not affected.	(1) Stridor (Biphasic) (2) No hoarseness d2 Vocal cord normal	(1) Stridor (2) No Hoarseness d2 Vocal cord are normal	(1) Stridor (2) No Hoarseness d2 Vocal cord are normal Except in lary cyst.
Signs	Flexible laryngoscopy or direct laryngoscopy show * Grayish white in color Fibrous tissue between both V.C at anterior part with sharp crescentic posterior border	Flexible laryngoscopy or direct laryngoscopy shows * Collapse of larynx during inspiration but open during expiration.	Flexible laryngoscopy or direct laryngoscopy shows * Stenosis at sub-glottic area.	Flexible laryngoscopy or direct laryngoscopy shows * Purple subglottic mass	Flexible laryngoscopy or direct laryngoscopy shows * cyst.
Treatment	• Small web :- No treatment but avoid upper respiratory tract infection that worsen stridor • Large web :- (1) Tracheostomy in severe stridor (2) MLS → excision of web by laser or conventional	• No treatment as condition improve spontaneously by age 18-24 months but avoid upper respiratory tract infection • Tracheostomy in severe stridor - MLS → excision of redundant mucosa by laser	- Tracheostomy in severe stridor - MLS → Removal of stenosis by laser - laryngofissure → if laser failed.	• No treatment as condition improve spontaneously. - Tracheostomy in severe stridor - MLS → excision by laser	- Tracheostomy in severe stridor - MLS → excision by laser or conventional

F.B ( in Larynx )

**More Common in Children \***

- **Exogenous FB** : - Vegetable as Water Melon Seeds & Beans  
- Non-Vegetable as Pins & Beads
- **Endogenous FB**: - Vomitus or Blood

\* Initial Stage: 3C 8 D

- a history of Attacks of **Coughing, Choking, Dyspnea & Cyanosis** in **Young Child** is Suspicious of FB Inhalation

### \* Latent Stage:

Period with **NO Symptoms** ..

- Vegetable FB → soon causes **Acute Vegetal Bronchitis** as "Allergic Reaction" to the Vegetable Oil
- Metallic FB → may **Remain Latent for Longer Period**

### ✿ Manifest Stage:

- **FB in Rt. Bronchus** .. causing

### Complete Obstruction or Partial Valvular Obstruction

The patient presented with **Dyspnea +**

- Complete Obstruction → leads to Lung Collapse :

- Percussion → **Dullness**
- Shift of Mediastinal → **to Same Side**
- Auscultation → **No Air Entry**

- \* Manifestation of obstruction  $\begin{cases} \text{Collapse} \\ \text{Emphysema} \end{cases}$
- \* Manifestation of infection  $\begin{cases} \text{Pneumonia} \\ \text{lung abscess} \end{cases}$

- **Partial Valvular Obstruction** → leads to **Emphysema** :

- Percussion → **Hyper-Resonance**
- Shift of Mediastinal → **to Opposite Side**
- Auscultation → **Diminished Air Entry**

- **X-ray** .. may show : • **Radio-Opaque** FB

- Collapse
- Emphysema

- **Bronchoscopy** : is **Diagnostic** to see FB

### - Removal by Bronchoscopy under Special Technique of Anaesthesia

( Because the Air-way is Shared between Anaesthetics & Otolaryngoscopy

**N.B. Heimlich Maneuver :**

**Sudden Compression of the Upper Abdomen & Xiphi-Sternum** is done in the Initial Stage of FB Inhalation to Extrude it

# Laryngeal Trauma

## Types of Trauma

### Mechanical

#### Surgical

- High Tracheostomy
- Endotracheal intubation
- Endoscopy

#### Accidental

- Gun shot
- Stab
- blow
- car accident
- F.B inhalation

### Physical

- Radiotherapy
- Hot steam inhalation

### Chemical

- Corrosive
- irritant gases

## Symptoms (H<sub>3</sub>S<sub>2</sub>N)

- (1) History of Trauma.
- (2) Hoarseness & injury of V.C
- (3) Hemorrhage
- (4) Stridor & Hmg. & edema
- (5) Shock either Hemorrhagic or neurogenic
- (6) Neck swelling & edema or Hematoma or emphysema.

## Signs

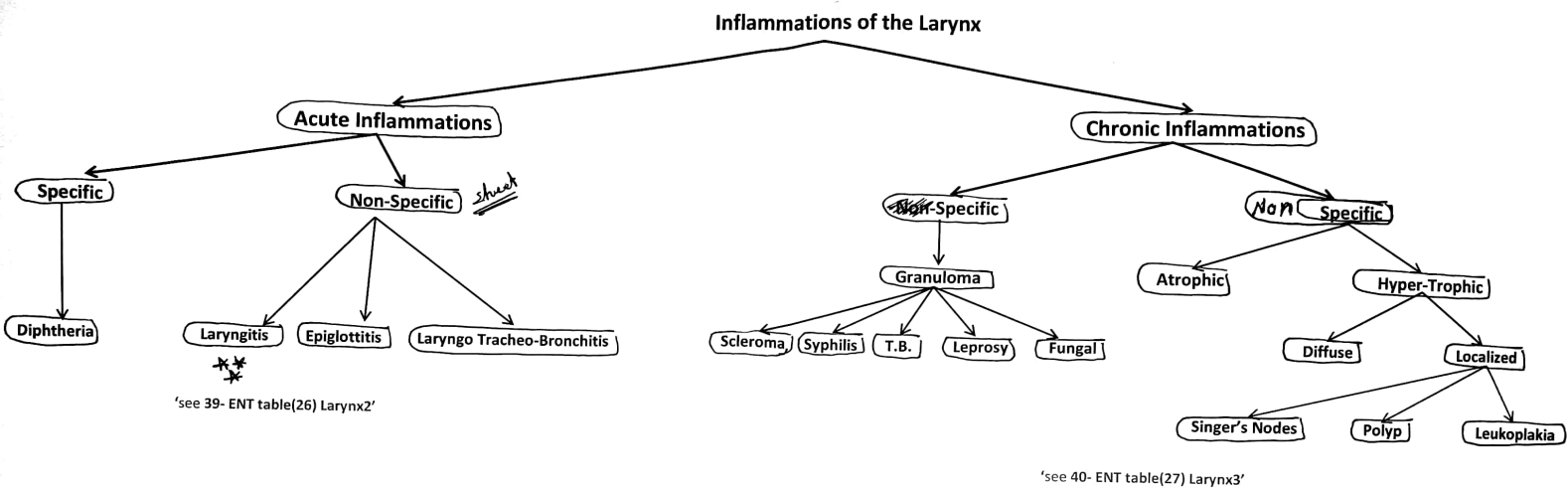
General :- shock

Local :-

- swelling
- Tenderness
- crepitus.

## Treatment

- (1) saving airway by Tracheostomy or Endotracheal intubation.
- (2) Saving blood volume (shock).
- (3) systemic Antibiotic to Prevent infection.
- (4) Steroid to decrease edema.
- (5) ligation of bleeding vessels.
- (6) Reduction and Fixation of fractured cartilage.



38- ENT diag.(10) Larynx1- Inflammations of the Larynx scheme



Acute Laryngeal Inflammations					
	Specific	Non-Specific			
	Laryngeal Diphtheria	Acute Non-Specific Laryngitis		Acute Epiglottitis (Supra-glottitis)	Acute Laryngo Tracheo-Bronchitis
		In Adults	In Children		
Def. :	—	Acute Inflammation of Laryngeal Mucosa		Inflammation of the mucosa of the Epiglottis	Acute Inflammation of Laryngeal & Lower Respiratory Mucosa
Causes :	usually Secondary to Pharyngeal (Faucial) Diphtheria	usually associated with Upper Respiratory Infection (as Common Cold or Exanthemata) - Organisms : starts by <u>Viral</u> then 2 <sup>ry</sup> <u>Bacterial Infection</u> - Predisposing Factors : • Local : Abuse of Voice & Smoking • General : Low General Resistance & Pollution	* it's <u>More Dangerous</u> than Adults .. causing Stridor in Children due to : - Larynx → Small 'easy Obstruction' - Larynx → Funnel-Shaped with Very Narrow Subglottic Area 'easy Obstruction' - Sub-mucosa → Loose 'easy Oedema' - Laryngeal Cartilage → Softer 'easy Collapse'	usually associated with <u>Upper Respiratory Infection</u> (as Common Cold or Exanthemata) - Organisms : <u>Haemophilus influenza</u> * <u>More in Children</u>	usually associated with <u>Upper Respiratory Infection</u> (as Common Cold or Exanthemata) - Organisms : usually <u>Viral</u> * <u>More in Children</u>
Clinical Picture :	Symptoms :	• General : - Constitutional Symptoms 'group of symptoms that can affect many different systems of the body' e.g. Weight loss, Fevers, Fatigue, and Malaise , <u>Headche</u> .			
	Signs :	- Hoarseness - Stridor	• Local : - Hoarseness → Main Symptom in Adults *** - Stridor → Main Symptom in Children ***	• Local : - <u>Hoarseness</u> (Hot Potato 'Muffled' Voice) - Stridor 'Inspiratory' - <u>Dysphagia &amp; Odynophagia</u> ***	• Local : - Stridor - Hoarseness - Cough & Expectoration ***
Treatment :		- Dirty Grayish Membrane over the Laryngeal Inlet  # Investigations : As Faucial Diphtheria Throat Swab for : - Direct Smear : G +ve bacilli ( <u>Chinese Letter Appearance</u> ) - Culture on Loeffler's Serum or Tellurite Medium	- Diffuse Congestion and Oedema of VC & Laryngeal Mucosa especially Subglottic Area in Children	- Severely Congested & Oedematous Epiglottis	Sub-glottic Oedema & Congested Laryngeal Mucosa
		1- Saving the Air-way .. by <u>Endo-tracheal Intubation</u> , or [ <u>Tracheostomy</u> in Sever Stridor ] 2- Anti-Toxic Serum 3- Systemic Antibiotic	• General : - Complete Bed Rest + Plenty of Warm Fluids • Systemic Antibiotics + Analgesics • Local : - Complete Voice Rest • Steam Inhalation with Tincture Benzoin	* Hospitalization + • Systemic Antibiotics by <u>Injection</u> - Steroids → ↓ Oedema - Supplying O <sub>2</sub> Inhalation • Steam Inhalation with Tincture Benzoin - Saving the Air-way .. by <u>Endo-tracheal Intubation</u> , or [ <u>Tracheostomy</u> in Sever Stridor ]	

# Chronic Laryngeal Inflammations

Chronic Laryngeal Inflammations						
Non-Specific						
		Chronic Atrophic Laryngitis	Chronic Diffuse Hypertrophic Laryngitis	Vocal Cord Nodules (Singer's Nodes)	Chronic Localized Hypertrophic Laryngitis	Leukoplakia
					Laryngeal Polyp	
Def.		—	Chronic Diffuse Inflammation with Hypertrophy of Laryngeal Mucosa	Localized Area of VC Hyperplasia	Polypoid Mucosa on the VC	<ul style="list-style-type: none"> <li>Grossly :</li> <li>Raised White Patch above the surface epith.</li> <li>Microscopically :</li> <li>Hyperplasia, Hyperkeratosis &amp; Acanthosis .. but the basement membrane is intact</li> <li>It's a Precancerous Lesion</li> </ul>
Cause		usually associated with Atrophic Rhinitis - Laryngeal Mucosa → Pale, Dry & Covered with Crusts	<ul style="list-style-type: none"> <li>Repeated Acute Attack</li> <li>Persistence of the Predisposing Factors (Smoking, Voice Abuse, ...)</li> </ul>	Voice Abuse → Sub-epithelial Hematoma → Organization	Voice Abuse	
Clinical Picture	Symp.	<ul style="list-style-type: none"> <li>Hoarseness</li> <li>Stridor</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> <li>Irritative Cough</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> </ul>
	Signs	<ul style="list-style-type: none"> <li>Chronic</li> <li>Non specific causes</li> <li>Stridor</li> </ul>	<ul style="list-style-type: none"> <li>In-direct Laryngoscopy → Bi-lateral Diffuse Symmetrical Thickening &amp; Congestion of VC</li> <li>N.B. <u>Reinke's Oedema</u> is Oedema of the Sub-epithelial Space of the VC</li> </ul>	<ul style="list-style-type: none"> <li>Bi-lateral Small Nodules at the Junction between Anterior 1/3 &amp; Posterior 2/3</li> </ul>	<ul style="list-style-type: none"> <li>Sessile or Pedunculated Uni-lateral Polyp w may be</li> <li>Grayish [Oedematous Polyp]</li> <li>Reddish [Vascular Polyp]</li> <li>Whitish [Fibrotic Polyp]</li> </ul>	<ul style="list-style-type: none"> <li>as a gross picture J</li> <li>Raised white patch on surface Epithelium</li> </ul>
Treatment		<ul style="list-style-type: none"> <li>Potassium Iodide</li> <li>Direct Laryngoscopy → to Remove the Crusts</li> </ul>	<ul style="list-style-type: none"> <li>Avoid the Predisposing Factors</li> <li>Steam Inhalation with Tincture Benzoin</li> <li>Micro-LaryngoSurgery (MLS)</li> <li>with Stripping of VC 'either Conventional or Laser' Followed by Speech Therapy</li> </ul>	<ul style="list-style-type: none"> <li>Complete Voice Rest</li> <li>If the Nodules are Small → Speech Therapy</li> <li>Micro-LaryngoSurgery (MLS) with Removal of Nodules 'either Conventional or Laser' Followed by Speech Therapy</li> </ul>	<ul style="list-style-type: none"> <li>Complete Voice Rest</li> <li>Micro-LaryngoSurgery (MLS) with Removal of Polyp 'either Conventional or Laser' Followed by Speech Therapy</li> </ul>	<ul style="list-style-type: none"> <li>Micro-LaryngoSurgery (MLS) with Removal of Lesion 'either Conventional or Laser' Followed by Careful Follow-up</li> </ul>
Specific [Granuloma] .. Chronic Specific Inflammation characterized by Formation of Macrophages						
		Laryngo-Scleroma	T.B. Laryngitis	Syphilis	Leprosy	
Caused by ..		Klebsiella rhinoscleromatis	Mycobacterium T.B.	Treponema pallidum	<ul style="list-style-type: none"> <li>Caused by : Mycobacterium leprae</li> <li>Site : Anterior Part of Larynx</li> </ul>	
Aetiology		<ul style="list-style-type: none"> <li>usually 2ry to Rhinoscleroma</li> <li>It's the COMMONEST ENT Granuloma in EGYPT</li> </ul>	<ul style="list-style-type: none"> <li>usually 2ry to Pulmonary T.B.</li> </ul>	—	<b>Fungal Infection</b>	
Site		Sub-glottic area (Junctional area between St. Sq. epith. & Resp. epith.) it starts as Bi-lateral Nodules then Masses then Web	Posterior Part of the Larynx (Inter-arytenoid)	Gamma affects Anterior Part of Larynx	<ul style="list-style-type: none"> <li>Occur in patients with Low Immunity as Diabetics, Prolonged Antibiotic Therapy or AIDS</li> </ul>	
Clinical Picture	Symp.	<ul style="list-style-type: none"> <li>Stridor 'Biphasic'</li> <li>Hoarseness 'Not Marked'</li> <li>Crusty Expectoration</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> <li>Stridor</li> <li>Pain referred to the ear 'via Arnold's of Vagus'</li> <li>Pulmonary T.B. → Cough, Hemoptysis</li> <li>T.B. Toxemia :</li> <li>Night Fever &amp; Night Sweating</li> <li>Loss of Weight &amp; Loss of Appetite</li> </ul>	<ul style="list-style-type: none"> <li>Hoarseness</li> <li>Stridor</li> <li>NO Pain</li> </ul>	<ul style="list-style-type: none"> <li>Moniliasis</li> <li>Caused by : Candida albicans</li> <li>usually associated with Aerodigestive moniliasis</li> <li>Characterized by Milky Whitish Membrane</li> <li>Treatment : Anti-Fungal as Nystatin</li> <li>Aspergillosis</li> <li>Actinomycosis → causes cervical sinus with sulfur granules</li> </ul>	
	Signs	In-direct Laryngoscopy → Sub-glottic Masses or Web	In-direct Laryngoscopy → T.B. Granulation in Posterior Part of Larynx	In-direct Laryngoscopy → Syphilitic Granulation in Anterior Part of Larynx	<ul style="list-style-type: none"> <li>Perichondritis of the Larynx :</li> <li>Def. : Inflammation of the Perichondrium of the Laryngeal Cartilage</li> <li>Causes : Traumatic, Mechanical, Chemical or Physical</li> <li>Inflammatory : T.B., Syphilis or Leprosy</li> <li>Neoplastic : Cancer Larynx invading Laryngeal Cartilage</li> <li>Clinical Picture :</li> <li>Symptoms : - General : Fever, Headache &amp; Malaise</li> <li>- Local : Stridor, Hoarseness, Pain in the Neck referred to Eat &amp; Dysphagia</li> <li>Signs : - Inspection → Broadening of Larynx</li> <li>- Palpation → Tenderness</li> <li>- Indirect Laryngoscopy → Congested Oedematous Laryngeal Mucosa</li> <li>Complications : Necrosis of the Cartilage &amp; Fibrosis → Stenosis</li> <li>Treatment :</li> <li>Medical : Systemic Parenteral Antibiotics + Analgesic Antipyretics</li> <li>Surgical : - Tracheostomy (Low) .. in Sever Stridor</li> <li>- Incision &amp; Drainage of Pus with Removal of Necrosed Cartilage</li> <li>- Laryngectomy .. if there is Extensive Necrosis</li> </ul>	
Complications		—	Perichondritis → Necrosis of Cartilage → Laryngeal Stenosis	—		
Investigation		<ul style="list-style-type: none"> <li>X-ray → Narrow Air Column</li> <li>Ct → to show Site, Degree &amp; Length of Stenosis</li> <li>Direct Laryngoscopy &amp; Biopsy → Russel Bodies &amp; Mikulicz Cells in Active Stage</li> </ul>	—	—		
Treatment		<ul style="list-style-type: none"> <li>Medical Treatment :</li> <li>Rifampicin : 600 mg/day [Side Effects : Hepatotoxic &amp; Red Discoloration of Urine]</li> <li>Streptomycin : 1 gm/day for 40 days [Side Effects : Ototoxic &amp; Nephrotoxic]</li> <li>Surgical Treatment :</li> <li>Tracheostomy (Low) .. in Sever Stridor</li> <li>Micro-LaryngoSurgery (MLS) &amp; Excision of the Web by Laser</li> <li>Laryngo-Fissure with Removal of Web &amp; Covering the area by Skin Graft</li> </ul>	<ul style="list-style-type: none"> <li>Tracheostomy .. in Sever Stridor</li> <li>Anti-Tuberculous Treatment : as Rifampicin - Isoniazid</li> </ul>	<ul style="list-style-type: none"> <li>Tracheostomy .. in Sever Stridor</li> <li>Anti-Syphilitic Treatment : as Penicillin</li> </ul>		

40- ENT table(27) Larynx3- Chronic Laryngeal Inflammations

Tumor of larynx  $\left\{ \begin{array}{l} \text{benign} \rightarrow \text{single Papilloma, Multiple Papillomatosis} \\ \text{Malignant} \rightarrow \text{cancer larynx} \end{array} \right.$

		Single Papilloma	Multiple Papillomatosis
		Juvenile Multiple Papillomatosis or Recurrent Respiratory Papillomatosis	
Clinical Picture	Age	Adults	Children
	Sex	More in $\sigma \rightarrow$	More in Males $\sigma$ More in $\sigma \rightarrow$
	Causes	-	Unknown .. but may be : - Autoimmune ✓ - Viral (Human Papilloma Virus) ✓ - Hormonal Disturbance (Estrogen Deficiency) ✓
	Gross Picture	Site Arises at VC [mainly Glottic] shape Whitish, Warty or Keratotic, Sessile or Pedunculated Papilloma = Vascular Connective Tissue Core covered by Hyperplastic St. Sq. Epith.	Site affecting Any Part of Larynx even Trachea & Bronchi & around the Tracheostomy Opening Multiple Warty Growth, Sessile shape Papilloma but Multiple
	Microscopic Picture		
	Symptoms	- Hoarseness - if Large $\rightarrow$ Stridor 'rare'	- Stridor - Hoarseness
Pathology	Signs	as gross picture J.. seen by In-direct Laryngoscopy warty Gross & sessile or Pedunculated	as gross picture J.. seen by In-direct Laryngoscopy or Flexible Laryngoscopy Multiple. warty Growth & Sessile. or Pedunculated.
	Treatment	- Micro-LaryngoSurgery (MLS) & Removal 'either Conventional or Laser'	- if there is Sever Stridor $\rightarrow$ Tracheostomy - Micro-LaryngoSurgery (MLS) & Removal 'either Conventional or Laser' [the Best ttt] - Anti-Viral : Interferon - Hormonal : Estrogen - Recurrent .. but Spontaneous Regression at Puberty
	Prognosis	- Malignant Transformation = 5% [Pre-Cancerous]	



## Cancer larynx.

incidence	It constitute about 40% of Head and Neck cancer			
age	old age above 40 year			
Sex	More Common in Male. ♂:♀ = 8:1			
P.F	<ul style="list-style-type: none"><li>• Smoking</li><li>• Alcohol</li><li>• Smoking and Alcohol Have synergistic effect</li><li>• Irradiation.</li></ul>			
Pathology	<u>Gross Picture</u>		<u>Microscopic Picture</u>	
	<u>Shape</u>	<u>site</u>	Squamous cell carcinoma in 98% of cases	
	<ul style="list-style-type: none"><li>• ulcer</li><li>• Cauliflower mass.</li><li>• Nodular infiltrative</li></ul>	<ul style="list-style-type: none"><li>• Glottic → 70%</li><li>• Supraglottic → 25%</li><li>• subglottic → 5%</li></ul>		
	<u>Spread and Prognosis.</u>			
	<u>local spread</u>	<u>lymphatic spread.</u>		<u>Blood spread.</u>
<ul style="list-style-type: none"><li>• local spread to Surrounding Structure.</li></ul> <p><u>example</u> Glottic spread to</p> <ul style="list-style-type: none"><li>• supra glottic</li><li>• sub glottic</li><li>• Paraglottic space.</li></ul> <p>N.B. Extension of glottic carcinoma To Ant. Commissure has bad Prognosis</p> <ul style="list-style-type: none"><li>• Extension of supraglottic carcinoma To Epiglottis has bad Prognosis.</li></ul>	<u>Supra Glottic</u> <ul style="list-style-type: none"><li>• To upper deep cervical L.N</li><li>• bad prognosis (one of silent area)</li></ul>	<u>Glottic area</u> <ul style="list-style-type: none"><li>• No lymphatic Drainage.</li><li>• Good prognosis</li></ul>	<u>Sub Glottic area</u> <ul style="list-style-type: none"><li>• lower deep cervical</li><li>• Para Tracheal L.N</li><li>• Superior Mediastinal</li><li>• Bad Prognosis.</li></ul>	<ul style="list-style-type: none"><li>• lung.</li><li>• liver</li><li>• brain</li><li>• bone.</li></ul>
symptoms.	<u>symptoms of Primary tumor</u>	<u>symptoms of local spread</u>	<u>symptoms of lymphatic spread</u>	<u>symptoms of blood spread.</u>
	(1) Hoarsness (early in glottic)	Dysphagia if Extend to Hypopharynx.	Neck swelling. and lymph node Enlargment	lung:- <ul style="list-style-type: none"><li>• cough</li><li>• Hemoptysis</li></ul> liver:- <ul style="list-style-type: none"><li>• ↑ liver enzyme</li><li>• jaundice.</li><li>• bleeding.</li></ul> brain →bone →
	(2) stridor (early in subglottic)			
	(3) Discomfort sensation in Throat (Early in supraglottic carcinoma)			
(4) Referred otalgia Through Arnold's branch of vagus.				
signs.	<u>local Examination.</u>		<u>General Examination.</u>	
	<u>Larynx</u> :- indirect or flexible laryngoscopy to detect site, size, shape, Extension, of Tumor, Mobility of vocal cord and chink.  <u>Neck</u> To Exclude Lymph node Metastasis.		To exclude distant Metastasis especially in lung.	
TNM classif.				
Treatment.	<u>Curative Treatment.</u>		<u>Palliative Treatment</u>	
	According to TNM classification.		indicated in extensive cancer larynx fixed to vertebral column or with distant Metastasis	
	<ul style="list-style-type: none"><li>• Surgery</li><li>• Radiotherapy</li><li>• Combined.</li></ul>		<ul style="list-style-type: none"><li>• Pain Killer</li><li>• Palliative surgery as<ul style="list-style-type: none"><li>→ Tracheostomy for stridor</li><li>→ Gastrostomy for severe dysphagia</li></ul></li><li>• Palliative Radiotherapy or chemotherapy.</li></ul>	
	it Performed For <ul style="list-style-type: none"><li>✓ Primary tumor</li><li>✓ lymph Node.</li></ul>			



Pre cancerous lesion in larynx ?!

- (1) Leuko Plakia.
- (2) Single Papilloma.
- (3) laryngeal keratosis.

43- ENT comp.(4) Larynx6- Single Papilloma & Multiple Papillomatosis				Curative <del>Pathologic</del> Treatment	
For Primary Tumor				For lymph Node.	
Glottic Carcinoma.		Supra Glottic Carcinoma	Subglottic Carcinoma		
Tis	Surgical excision	T1	Either Surgical Excision	if Palpable.	Radical Neck dissection.
T1	either surgical excision (cordectomy) or Radiotherapy	T2	(Partial laryngectomy) or Radiotherapy		
T2	either surgical excision. (Partial laryngectomy) or Radio Therapy.		Surgical excision (Total laryngectomy) and Radiotherapy	if Not Palpable.	Selective neck dissection or Radiotherapy to the neck especially in supra glottic and subglottic carcinoma.
T3 T4	Surgical excision (Total laryngectomy) and Radio Therapy.	T3 T4	Surgical excision (Total laryngectomy) and Radiotherapy		

## TNM Classification of Cancer Larynx

### **T → 1ry Tumour**

**Tis** : Carcinoma in Situ

**T1** : Tumour Limited to One Area (Supra-, Sub- or Glottic) with Mobile Vocal Cords

**T2** : Tumour Extended to More than One Area with Mobile Vocal Cords

**T3** : Tumour Limited to Larynx with Fixed Vocal Cords

**T4** : Tumour Extended to Laryngeal Cartilage and/or **Extra Laryngeal Spread**

### **N → Lymph Node**

**No** : No Palpable Lymph Nodes

**N1** : Single, Ipsi-lateral, 3 cm or Less in diameter

**N2 : a** : Single, Ipsi-lateral, 3-6 cm in diameter

**b** : Multiple, Ipsi-lateral, Non More than 6 cm in diameter

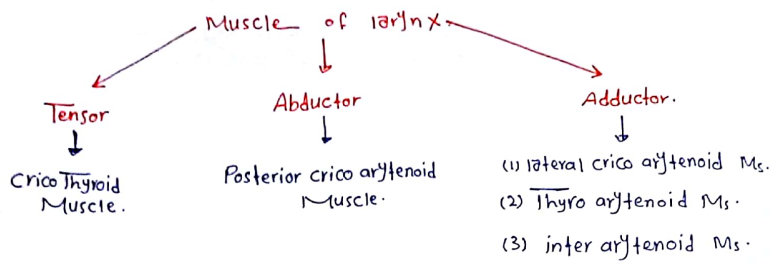
**c** : Contra-Lateral or Bi-lateral, Non More than 6 cm in diameter

**N3** : Node(s) **More than 6 cm in diameter**

### **M → Metastasis**

**Mo** : No Distant Metastasis

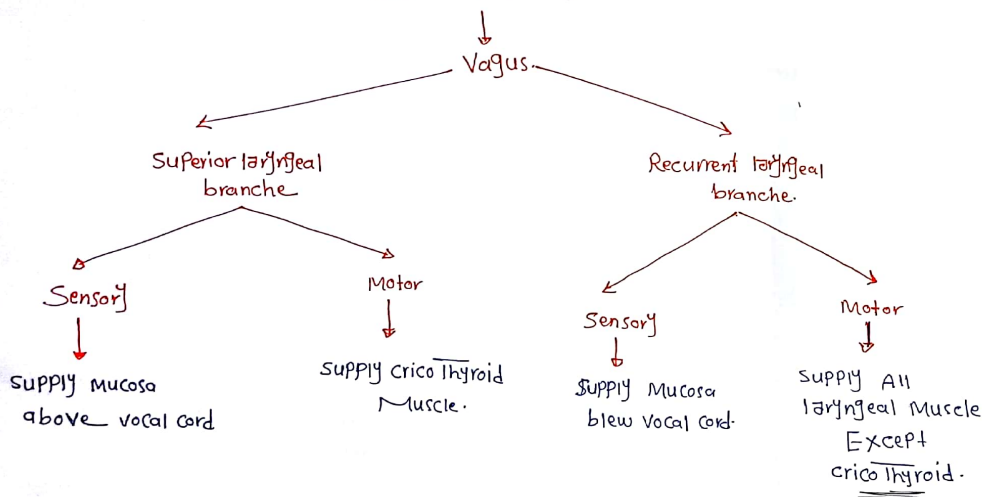
**N1** : there's Distant Metastasis



### Position of Vocal Cord

- ① Median → chink = zero
- ② Paramedian → chink = 4 mm
- ③ Cadaveric → chink = 18 mm
- ④ Abduction → chink = 14 mm
- ⑤ Full Abduction → chink = 18 mm

### Nerve supply to larynx.



### Explanation of Position.

(Wagner and Grossman Theory).

- injury of vagus → Cadaveric Position.  
(all muscle are paralysed).
- injury of RLN → Paramedian Position  
(as cricothyroid has some Adductor action and supplied by superior laryngeal)



## Clinical Picture.

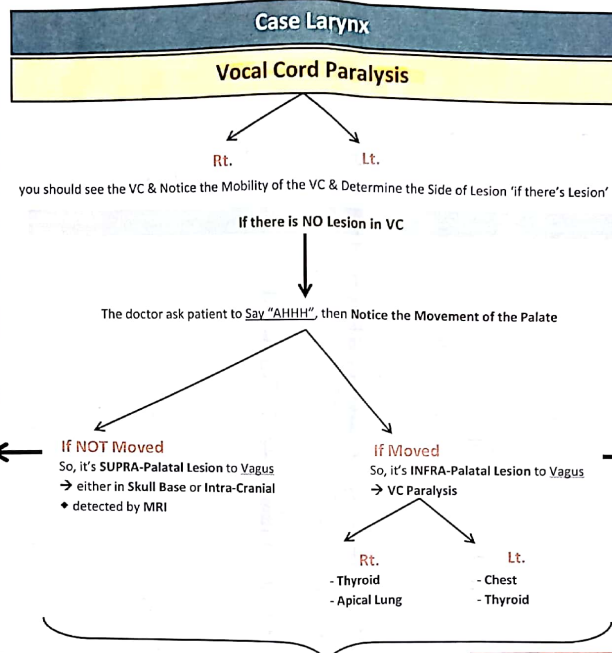
symptoms.

- Unilateral**
- 1 Hoarseness which improve spontaneously after 6-12 Months d2 Healthy cord cross to midline to meet paralysed cord.
  - 2 No stridor (Healthy cord open. Normally during breathing).

signs.

- Bilateral**
- 1 Stridor due to narrow chink by both immobile cords.
  - 2 No Hoarseness d2 both cords present near to midline.
- 1 Examination of larynx :- indirect or flexible laryngoscopy. detect the position of vocal cord.
- 2 Examination of Head, Neck, chest :- To detect causes of paralysis.

## Causes of V.C Paralysis.



## Investigation.

- 1 CT -> From skull base to mid Thorax. To detect any tumor mass.
- 2 Barium swallow -> If Cancer esophagus was suspected.
- 3 Thyroid scan -> If Cancer Thyroid was suspected.
- 4 Pan Endoscopy -> All Endoscopies and Take biopsy from suspected lesion.
- 5 Stroboscopy -> To see the mucosal waves

- 1 Intra-Cranial
- Traumatic: Head Trauma or Car Accident
  - Inflammatory: Meningitis or Encephalitis
  - Neoplastic: Brain Tumour
  - Vascular: Thrombosis, Hemorrhage or Embolism
  - Degenerative: Multiple Sclerosis (MS)
- 2 Cranial?
- Traumatic: Fracture Base
  - Inflammatory: Malignant Otitis Externa

- 3 Extra-Cranial
- Cranial:
    - Neoplastic: Carcinoma of the Naso-Pharynx
  - In the Neck: - Thyroid Operations (Rt. is More Liable)
    - Cancer Thyroid
    - Malignant Lymph Nodes
    - Neck Injury
    - Cancer Oesophagus
  - In the Chest (for Lt. Only): - Bronchogenic Carcinoma
    - Cardiothoracic Operations

If everything is NORMAL  
↓  
Idiopathic 25%

Treatment unilateral Paralysis.

- 1 Treatment of cause as Tumor (bronchogenic carcinoma)
- 2 wait 6-12 Months before intervention as spontaneous. Compensation may occur.
- 3 Surgical Treatment
 

indication :- No compensation after 6-12 Months.

✓ Aim :- Medial displacement and fixation of paralysed cord in midline.

Types :-

  - 1 Teflon injection lateral to paralysed cord.
  - 2 Medialization Thyroplasty
  - 3 Reinnervation Procedure which called Tucker's operation.

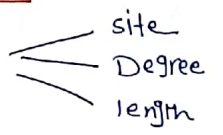
Treatment Bilateral Paralysis.

- 1 Tracheostomy in sever stridor
- 2 if detected at the end of Thyroid ectomy -> Reexploration as the nerve may be taken in ligature.
- 3 Surgical Treatment
 

✓ Aim :- lateral displacement of one of paralysed cord to improve the air way.

Types :-

  - 1 Arytenoid ectomy ± Posterior cordectomy.
  - 2 Woodman's operation (arytenoidectomy + Cordo Pexy).
  - 3 lateralization Thyroplasty.
  - 4 Reinnervation Procedure

	Laryngeal edema	Laryngeal stenosis	Laryngocele.
def		Narrowing of laryngeal <del>etc</del> lumen it is common in subglottic area.	It is cystic herniation of laryngeal saccule (ant. end of ventricle)
Causes	<u>Traumatic</u> :- Mechanical, chemical, physical <u>inflammatory</u> :- • Acute specific and non specific • Chronic specific (obstruction of lymphatic by Granuloma). • Extension of edema from Pharyngeal suppuration). <u>Neoplastic</u> :- Tumor obstructing lymphatic drain <u>Miscellaneous</u> :- • Angioneurotic edema (Allergy) • Cardiac, Renal, Hepatic edema.	<u>Congenital</u> Failure of Recanalization of laryngeal lumen <u>Traumatic</u> Mechanical, physical, chemical. <u>inflammatory</u> All Types of Granuloma. <u>Neoplastic</u> . • Carcinoma invade cartilage. • Carcinoma Treated by Radiotherapy. <u>N.B</u> M.C caus. of laryngeal stenosis. • Cuffed Endotracheal intubation then • laryngo scleroma.	<u>Congenital</u> <u>acquired</u> :- Caused by Repeated straining as • Glass blowers • Players of wind instrument.
symptoms	(1) stridor (2) Hoarsness	(1) Stridor (Biphasic) (2) No Hoarsness (as it in subglottic area)	(1) Hoarsness (2) stridor (3) Neck swelling.
signs	indirect or flexible laryngoscope show edema of laryngeal mucosa.	indirect or flexible laryngoscope show stenosis in subglottic area.	- Indirect or flexible laryngoscope show swelling
Treatment	• anti edematous drug as Hydrocortisone I.V • Tracheostomy or Endotracheal intubation in sever stridor	• Tracheostomy in sever stridor (low) • MLS → Excision of stenosis by laser • laryngo fissure → in Thick fibrosis.	• MLS → For internal laryngocele. • External Excision For External laryngocele.
		<u>Investigation</u> - CT show  of stenosis - Direct laryngoscope.	<u>Types</u> • internal • External • Combined.

	Stridor	Hoarseness (Dysphonia)
def	difficulty noisy breathing due to partial upper way obstruction (larynx & Trachea).	Rough quality, low pitched voice d2 • impairment of V.C tension. • " " " Adduction. • " " " Mobility.
Causes	<ol style="list-style-type: none"> <li>1] Congenital (All).</li> <li>2] Traumatic (All)</li> <li>3] Inflammatory • All acute &lt; specific Non " • Chronic specific → Granuloma</li> <li>4] Neoplastic → benign :- Multiple Papillomatosis → Malignant :- Cancer larynx.</li> <li>5] Miscellaneous • bi lateral abductor v.c Paralysis • laryngeal edema. • laryngeal stenosis.</li> </ol>	<ol style="list-style-type: none"> <li>1] Congenital → web.</li> <li>2] Traumatic → (All)</li> <li>3] Inflammatory (All).</li> <li>4] Neoplastic (benign &amp; Malignant Tumor affect Vocal Cord).</li> <li>5] Miscellaneous • unilateral v.c Paralysis • laryngeal edema. • Crico arytenoid Joint Arthritis • Hystical</li> </ol>
Clinical Picture of upper airway obstruction	<ul style="list-style-type: none"> <li>• Stridor</li> <li>• Tachycardia (↑ Puls Rate)</li> <li>• Tachypnea (↑ Resp. Rate)</li> <li>• Working alae nasi</li> <li>• Working accessory Resp. Ms.</li> <li>• Congested Neck Vein.</li> <li>• Retraction of suprasternal, supraclavicular, intercostal space</li> <li>• Irritability, Fatigue.</li> </ul>	

N.B causes of stridor in children.

- ① Congenital (all).
- ② Traumatic • F.B inhalation.  
• Corrosive.
- ③ Inflammatory (all acute).
- ④ Neoplastic → Multiple Papillomatosis
- ⑤ Miscellaneous • laryngismus stridulus  
• laryngeal edema.  
• Bilateral abductor v.c Paralysis.

N.B 10



Tracheostomy. ?!

Epistaxis ?!

ip'ip'ip'

\*\*\*\*  
\*\*\*  
\*\*