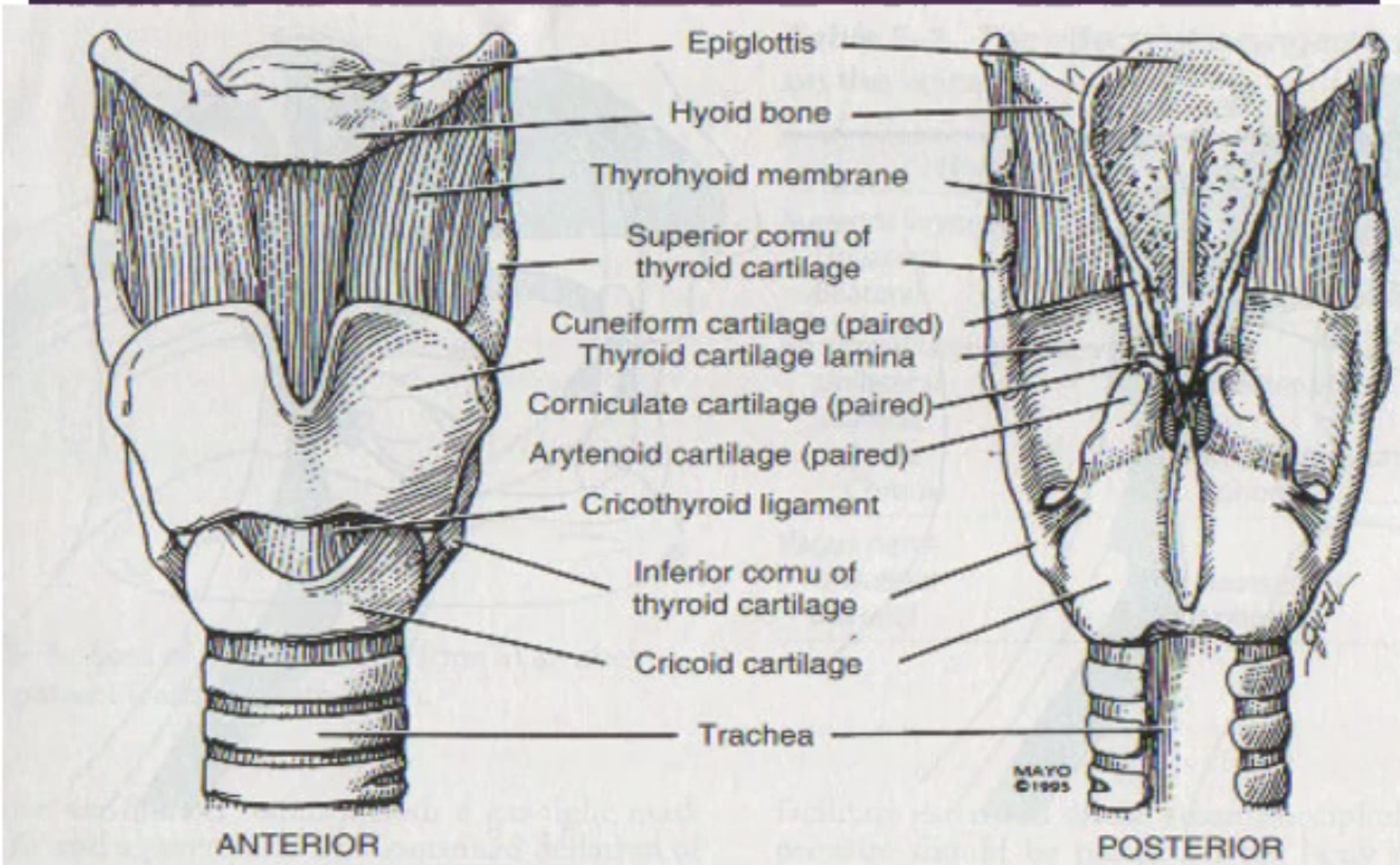
Hoarseness of the voice and laryngeal tumors

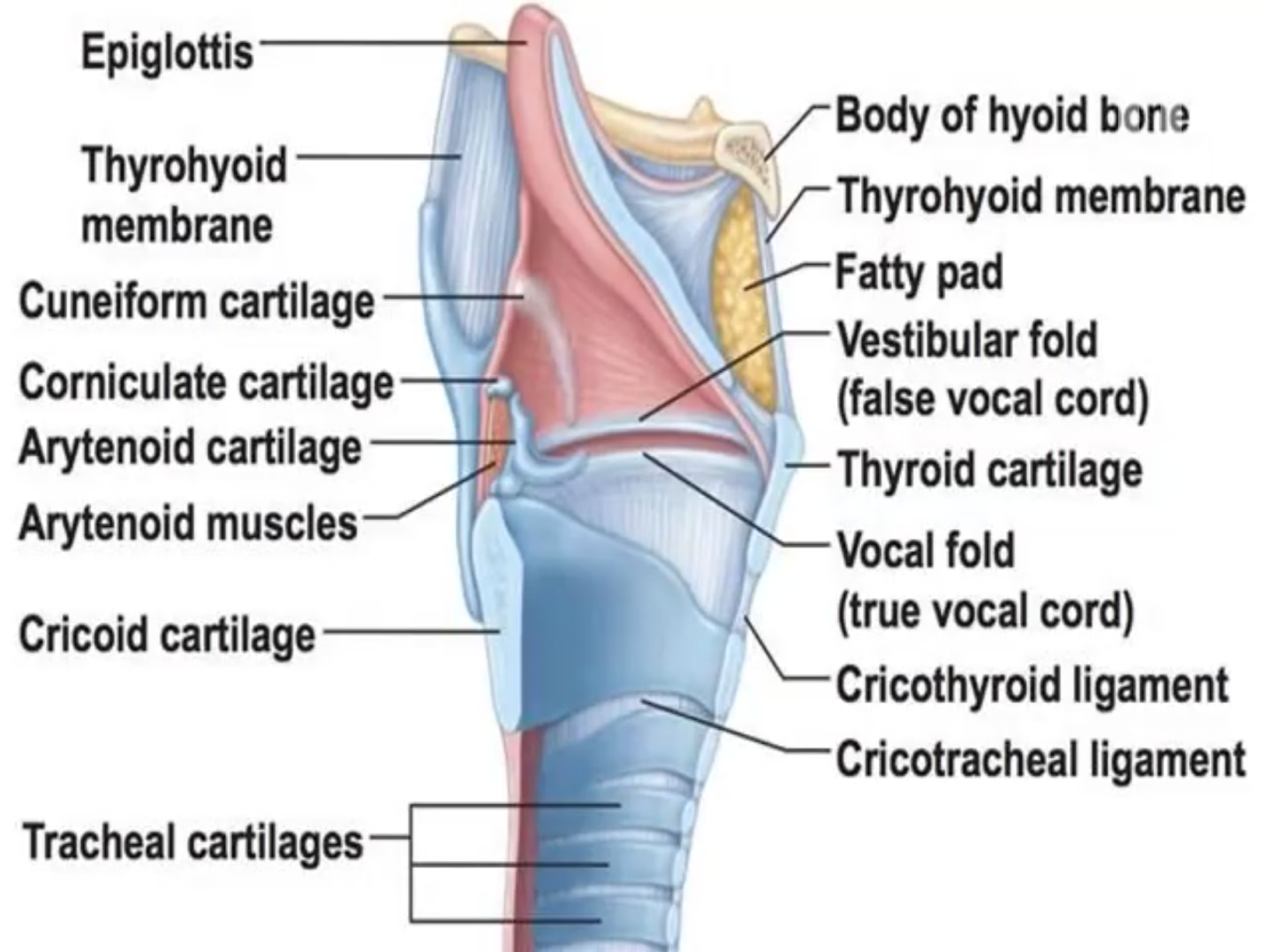
Hoarseness of the voice :

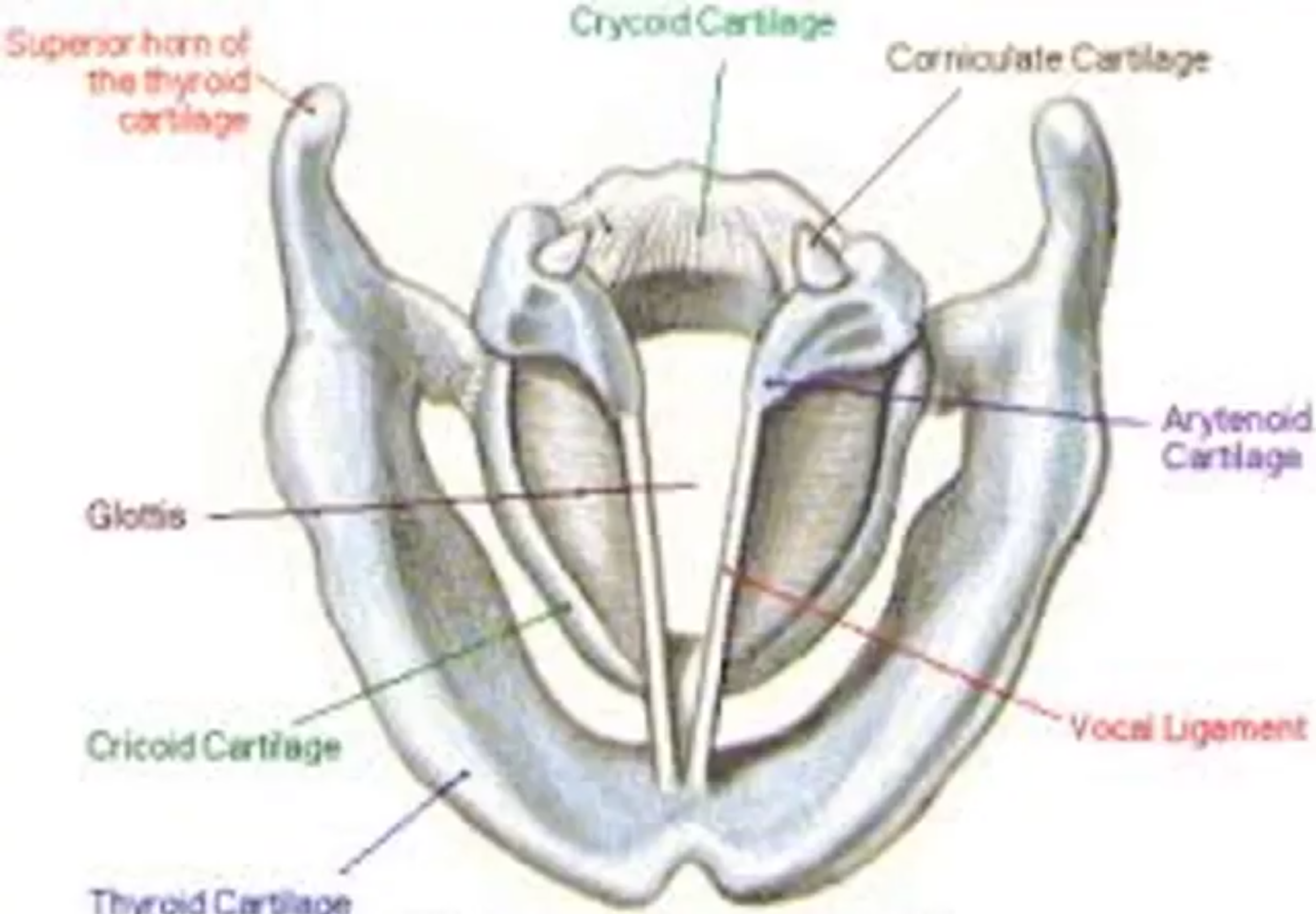
Change in the voice quality from voice harshness to voice weakness . Reflects abnormalities anywhere along the vocal tract from oral cavity to lungs.

Hoarseness is the commonest and often the only presenting in laryngeal carcinoma .

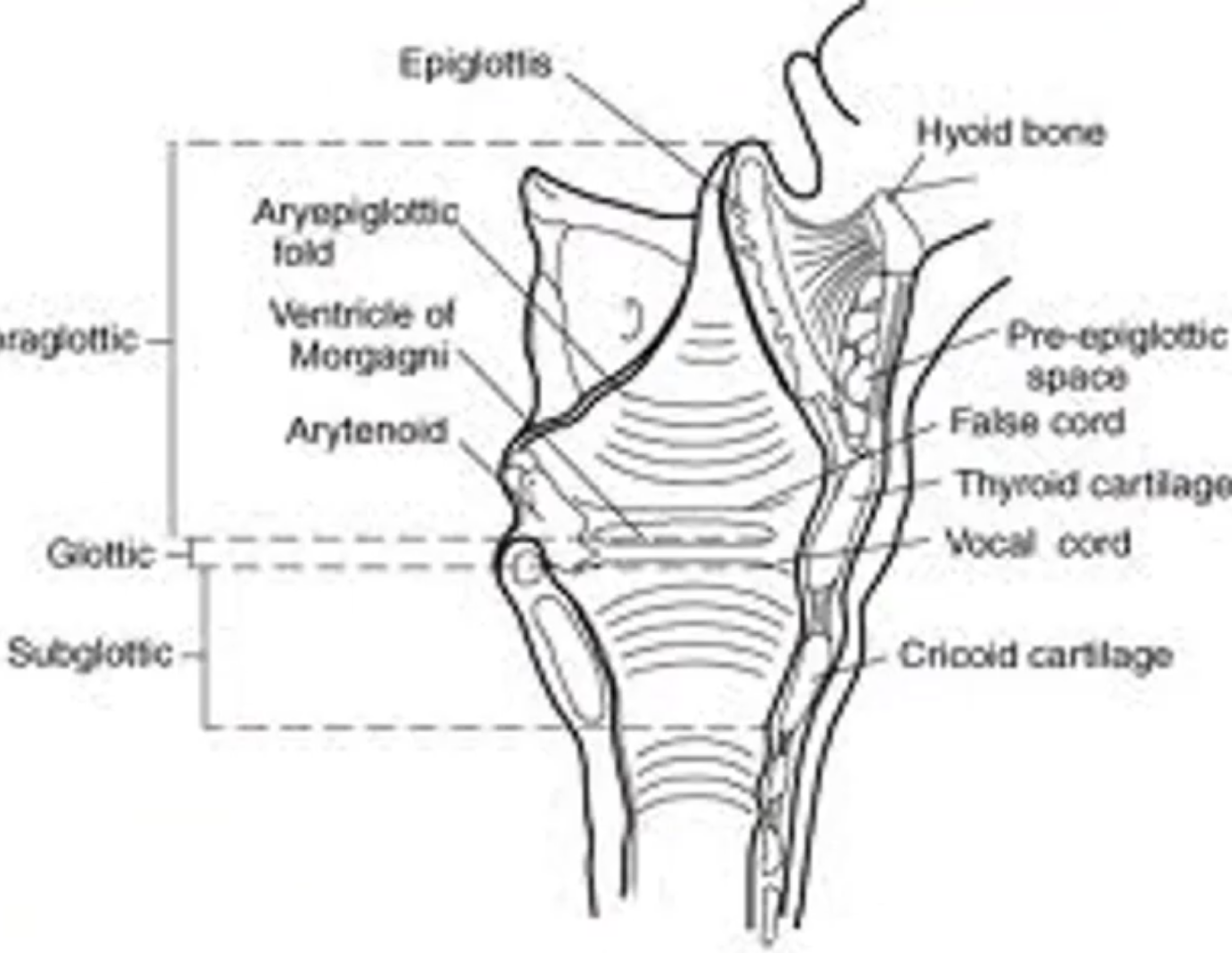
Anatomy of larynx

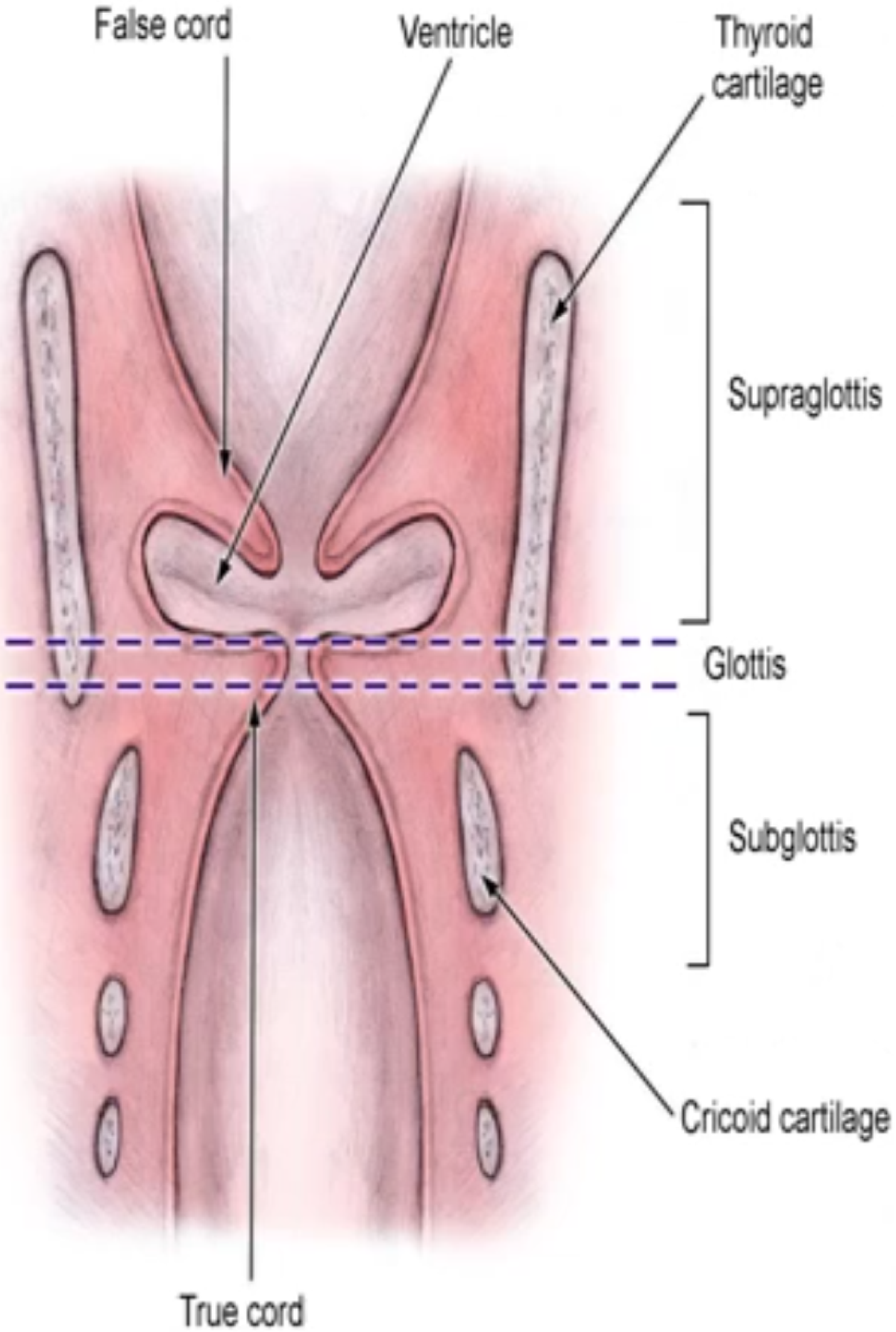



Epiglottis
Thyrohyoid membrane
Cuneiform cartilage
Corniculate cartilage
Arytenoid cartilage
Arytenoid muscles
Cricoid cartilage
Tracheal cartilages
Body of hyoid bone
Thyrohyoid membrane
Fatty pad
Vestibular fold (false vocal cord)
Thyroid cartilage
Vocal fold (true vocal cord)
Cricothyroid ligament
Cricotracheal ligament



The Larynx: viewed from above


Epiglottis
Hyoid bone
Aryepiglottic fold
Ventricle of Morgagni
Arytenoid
Supraglottic
Pre-epiglottic space
False cord
Thyroid cartilage
Glottic
Vocal cord
Subglottic
Cricoid cartilage



The larynx is divided into :

- supraglottis consists of the epiglottis, false vocal cords, ventricles, aryepiglottic folds, and the arytenoids.

- glottis includes the true vocal cords and the anterior commissure.

- subglottis is located below the vocal cords

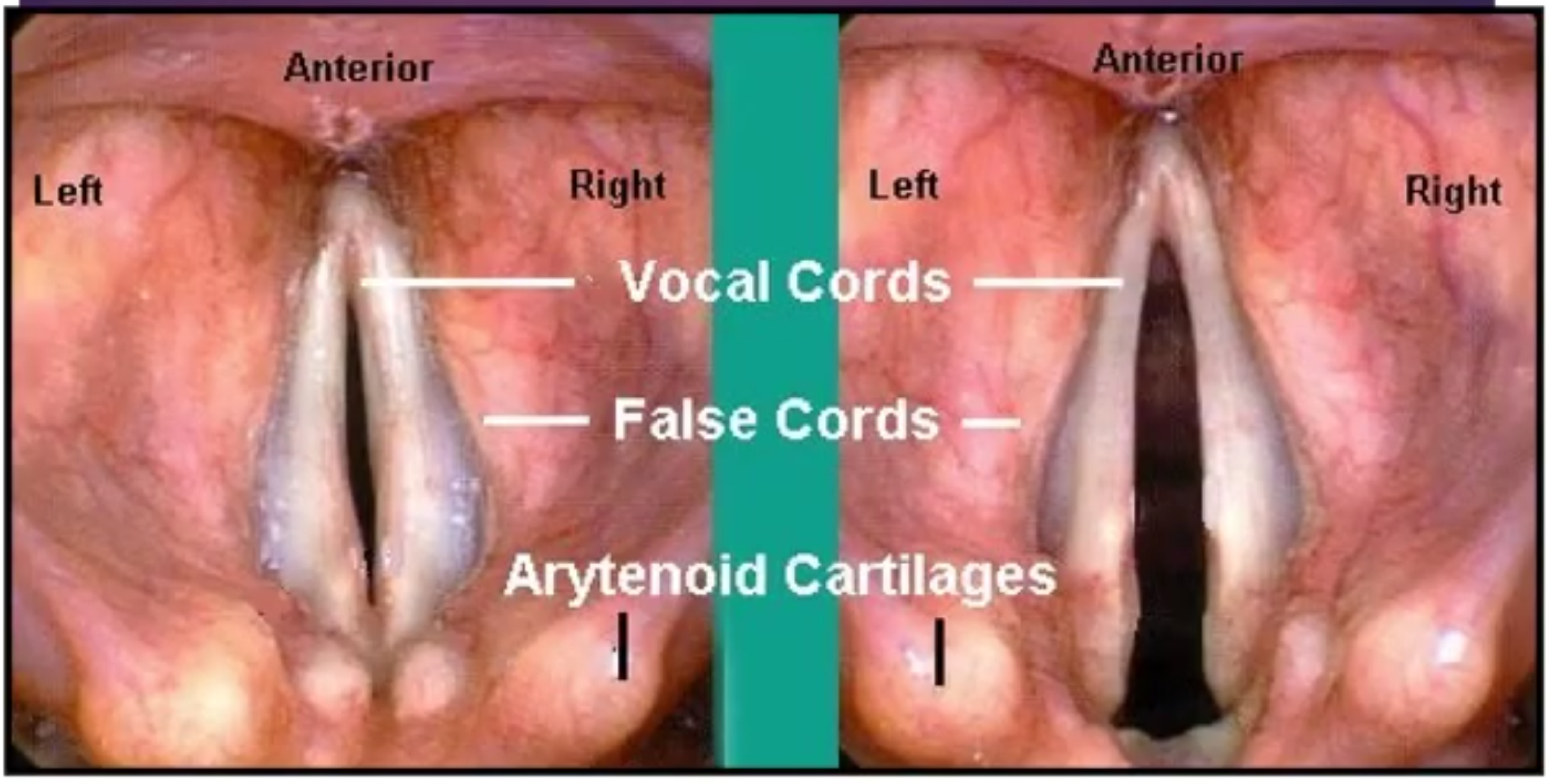
Laryngeal cartilages

3 large unpaired cartilages :

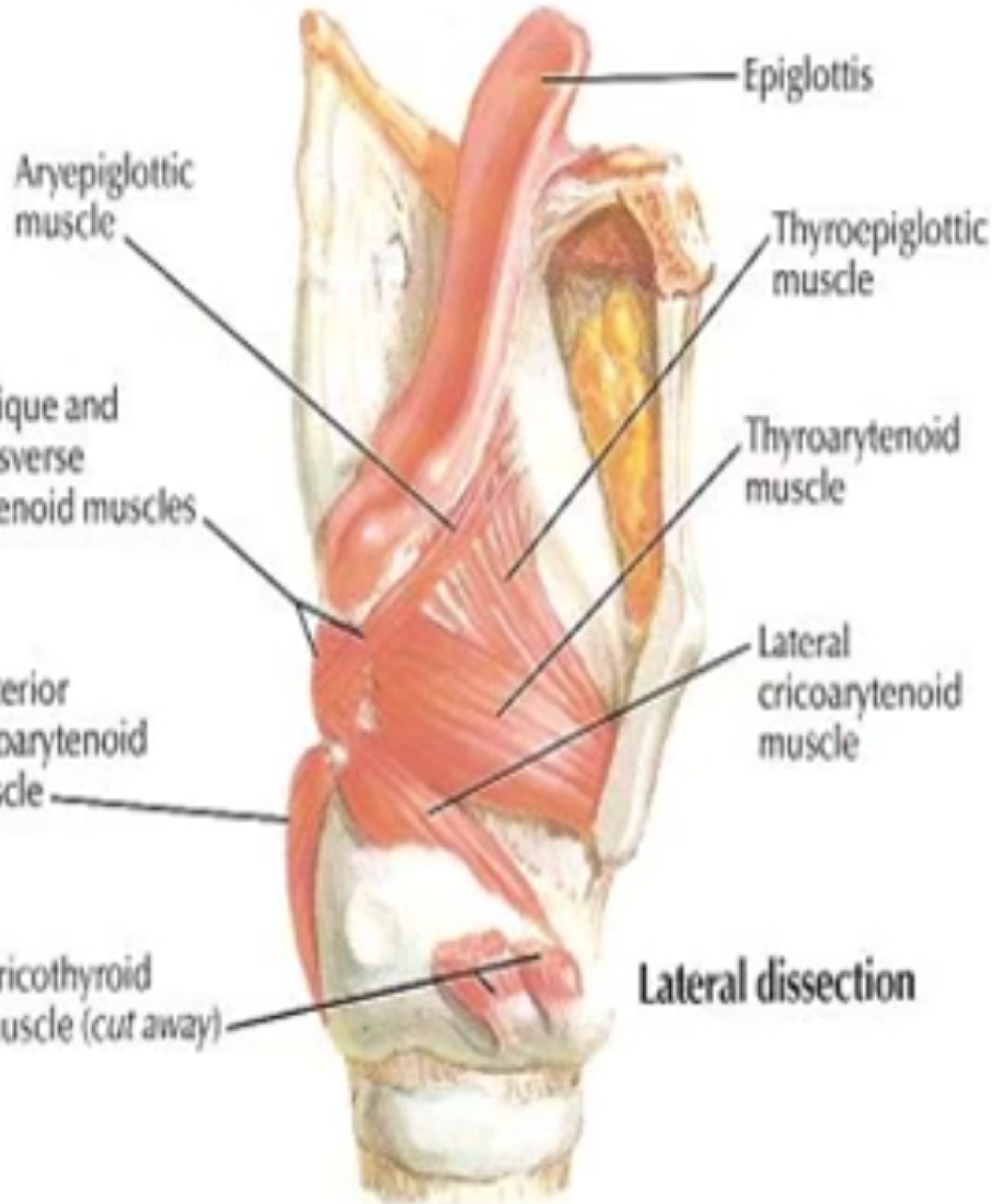
1- Cricoid
2- Thyroid
3- epiglottis

3 pairs of smaller cartilages :

1-Arytenoids
2-Corniculate
3-cuneiform

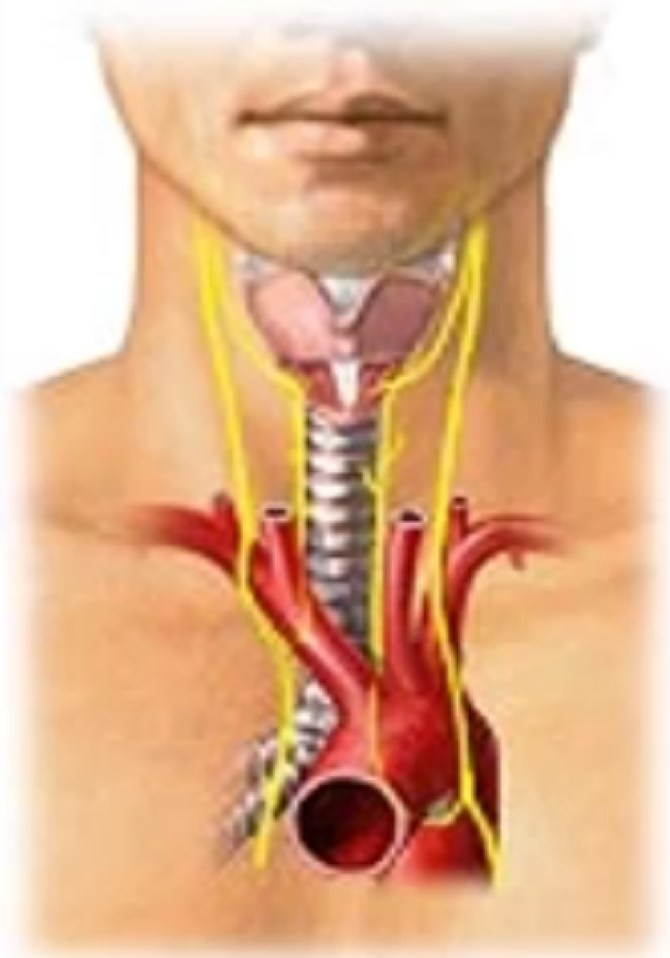

Anterior
Left
Right
Anterior
Left
Right
Vocal Cords
False Cords
Arytenoid Cartilages

Muscles of the larynx



Muscles innervations

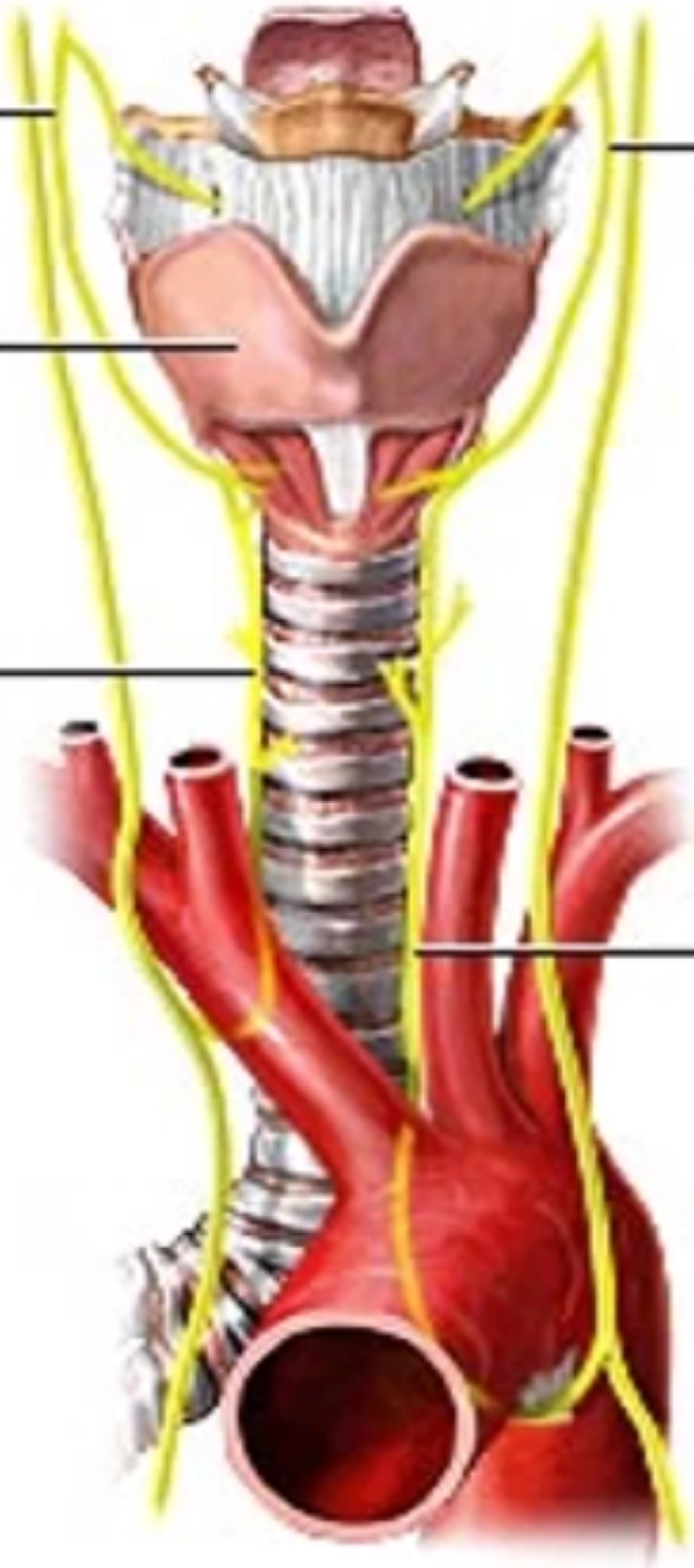
- All laryngeal muscles are supplied by recurrent laryngeal nerve except the cricothyroid muscle (supplied by the superior laryngeal nerve).
- Sensation above true VCs derived from superior laryngeal nerve, & below from recurrent laryngeal nerve.
- The only laryngeal abductor muscle is posterior cricoarytenoid muscle.



Right superior laryngeal nerve

Larynx

Right recurrent laryngeal nerve



Left superior laryngeal nerve

Left recurrent laryngeal nerve

CAUSES of hoarseness :

- Inflammatory : laryngitis.
- Neoplastic : vocal cord polyps, nodules, granulomas, cysts, laryngeal carcinoma, leukoplakia.
- Neuromuscular : vocal cord palsy, spasmodic dysphonia, movement disorder, Parkinson disease, CVA.
- Miscellaneous : vocal abuse, vocal cord atrophy, vocal cord scarring, hypothyroidism, Reinke's edema, GERD, postnasal drip.

Approach to the patient with hoarseness .... History & Exam

HISTORY

- Nature & chronology of voice problem.
- Exacerbating & relieving factors.
- Lifestyle, dietary, & hydration issues.
- Medical & drug history.
- Patient's voice use & requirements.
- Impact on quality of life.
- Risk factors of causes.

Symptom : duration, onset, pattern of symptoms (change in volume or quality), continuous or not

precipitating factors : recent URTI, reflux symptoms and heart burn, direct or vocal trauma, or endotracheal intubation should be noted.

occupation : pattern of voice use (shouting, singing), smoking and alcohol.

other symptoms : dysphagia, throat or ear pain, nasal blockage, sensation of lump in the throat, significant weight loss, coughing up blood, fatigue and weakness.

Past medical history : chest disease, allergies or eczema, thyroid surgery, neck trauma, neurological symptoms.

PHYSICAL EXAMINATION

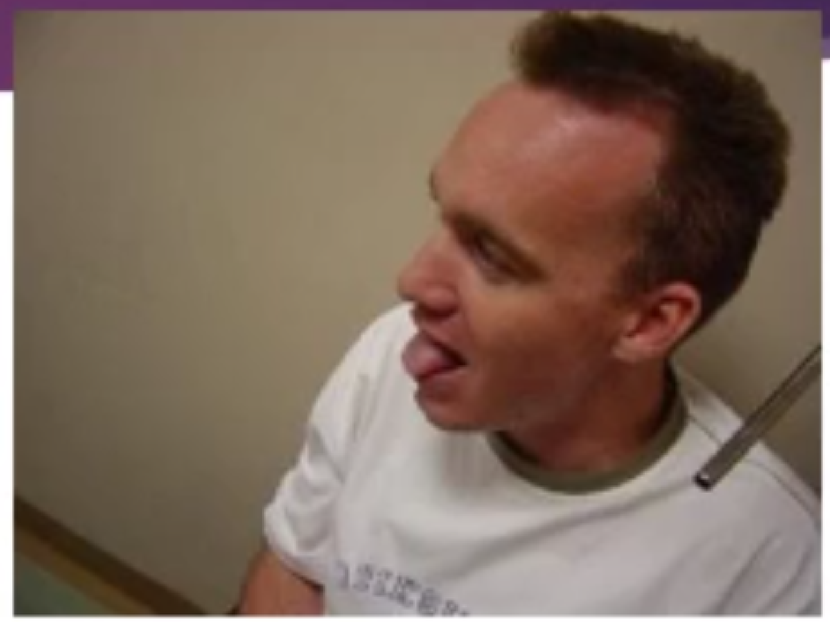
- RHINOLOGIC & OTOLOGIC EXAMINATION.
- NECK LYMPH NODE EXAMINATION.
- VISUALIZATION OF THE LARYNX BY:

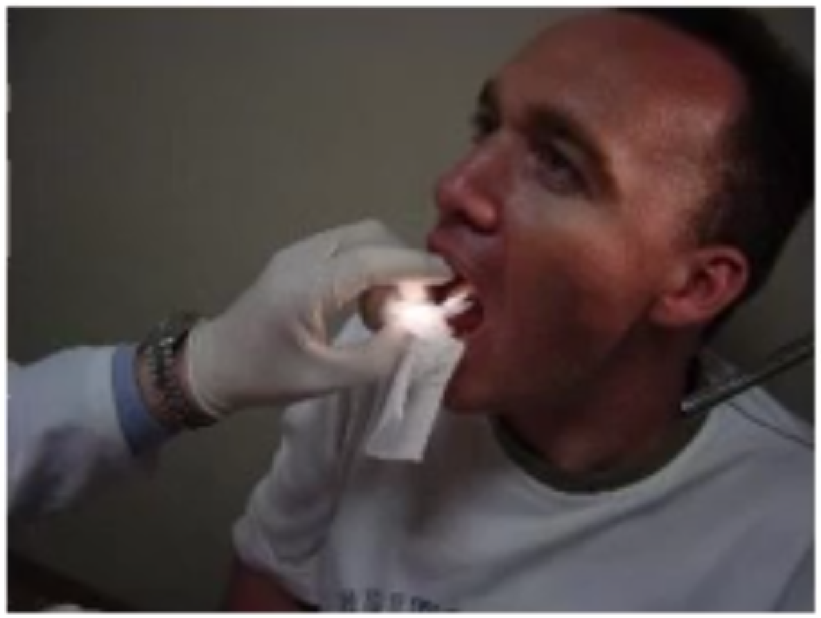
1- INDIRECT LARYNGOSCOPY. (miror)

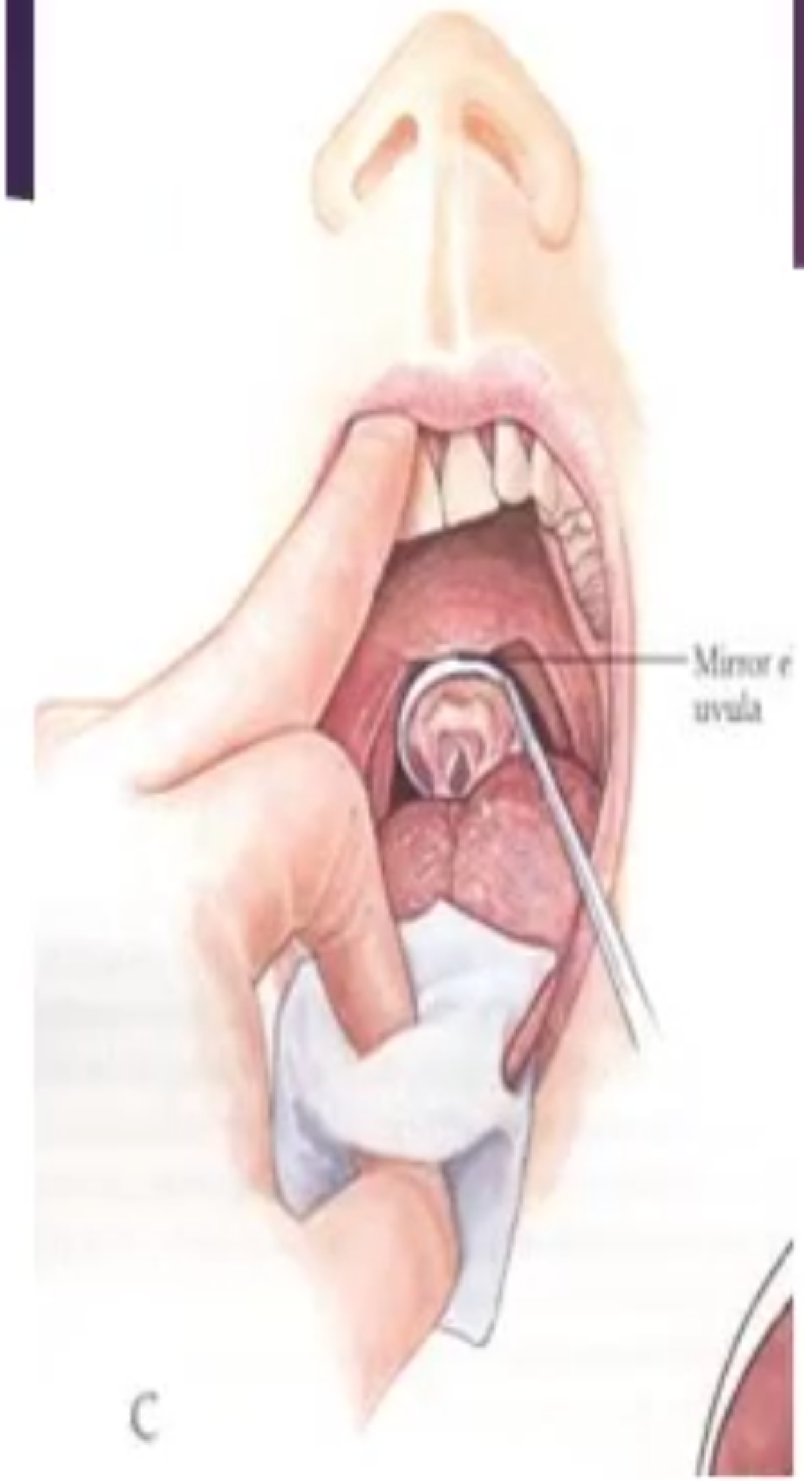
2- FIBEROPTIC NASOPHARYNGO-LARYNGOSCOPY.

3- RIGID LARYNGOSCOPY.

INDIRECT LARYNGOSCOPY



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uvula
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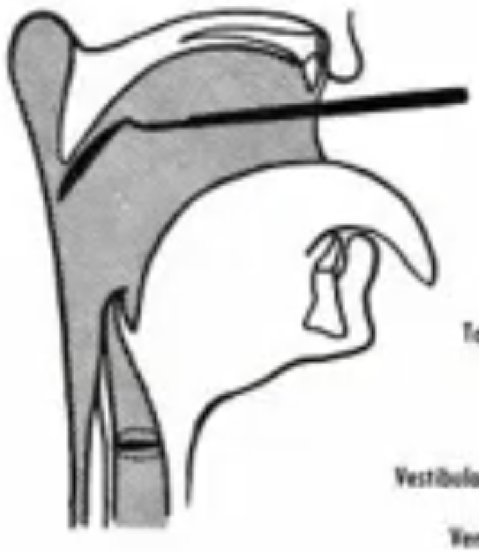
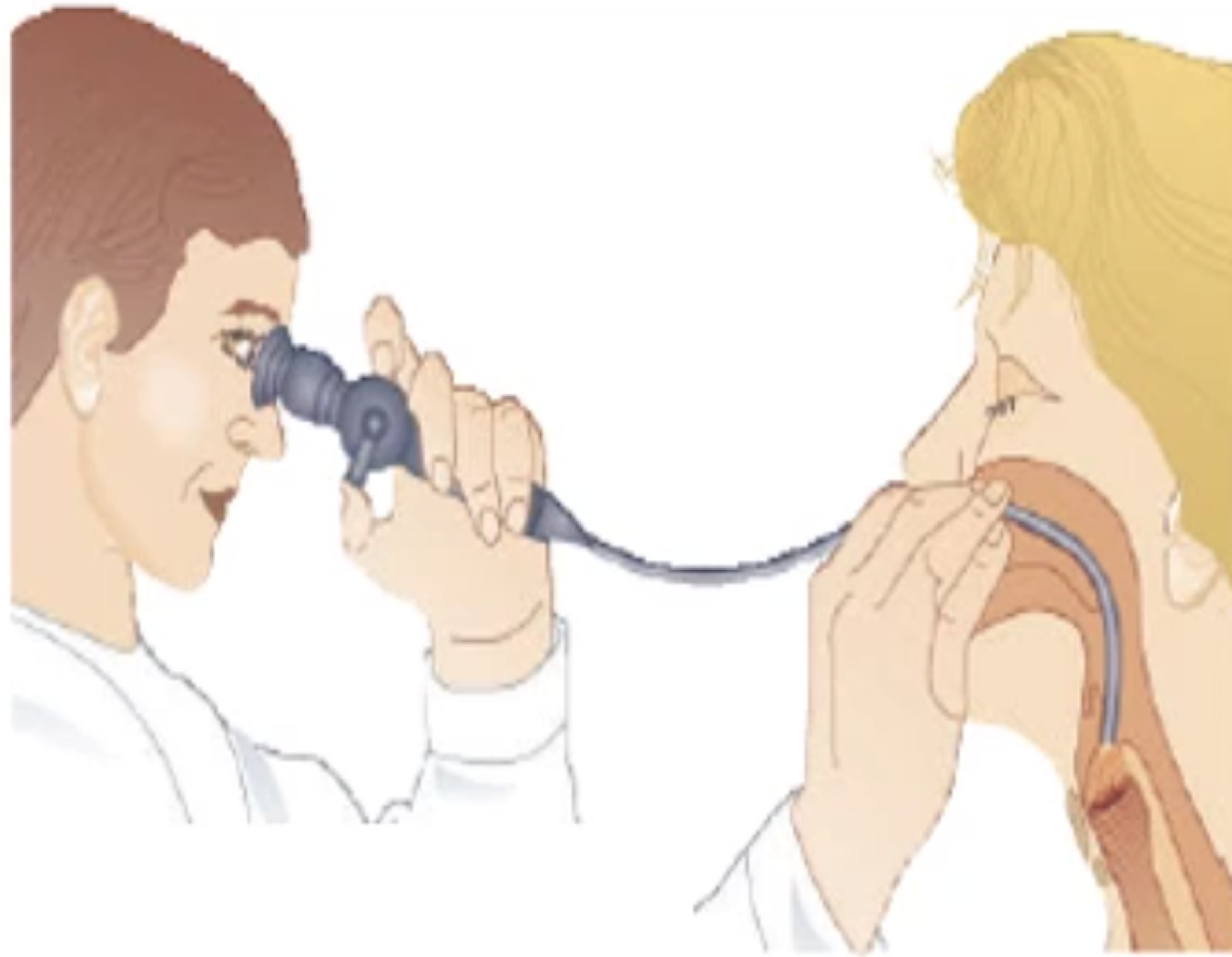
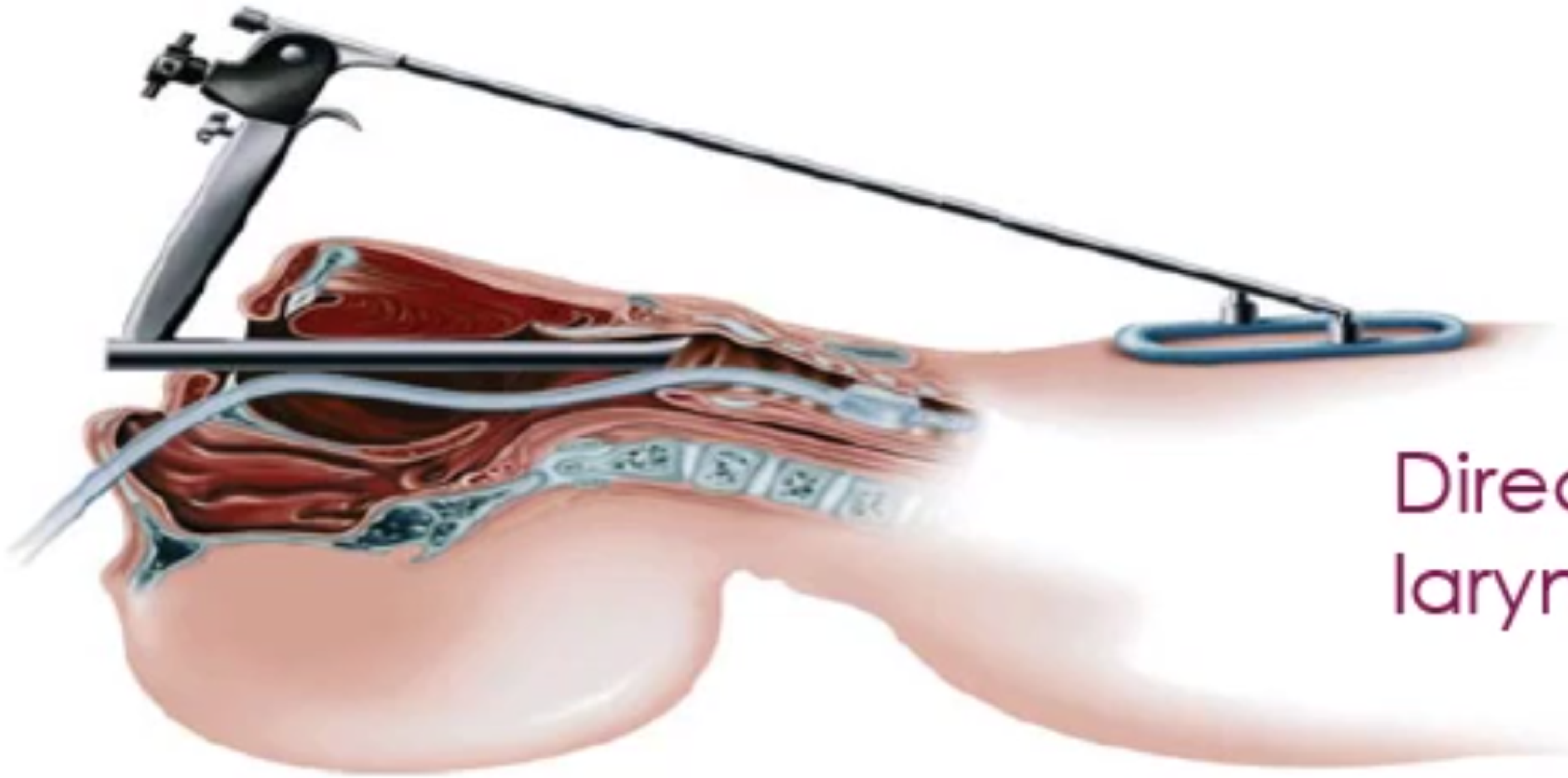


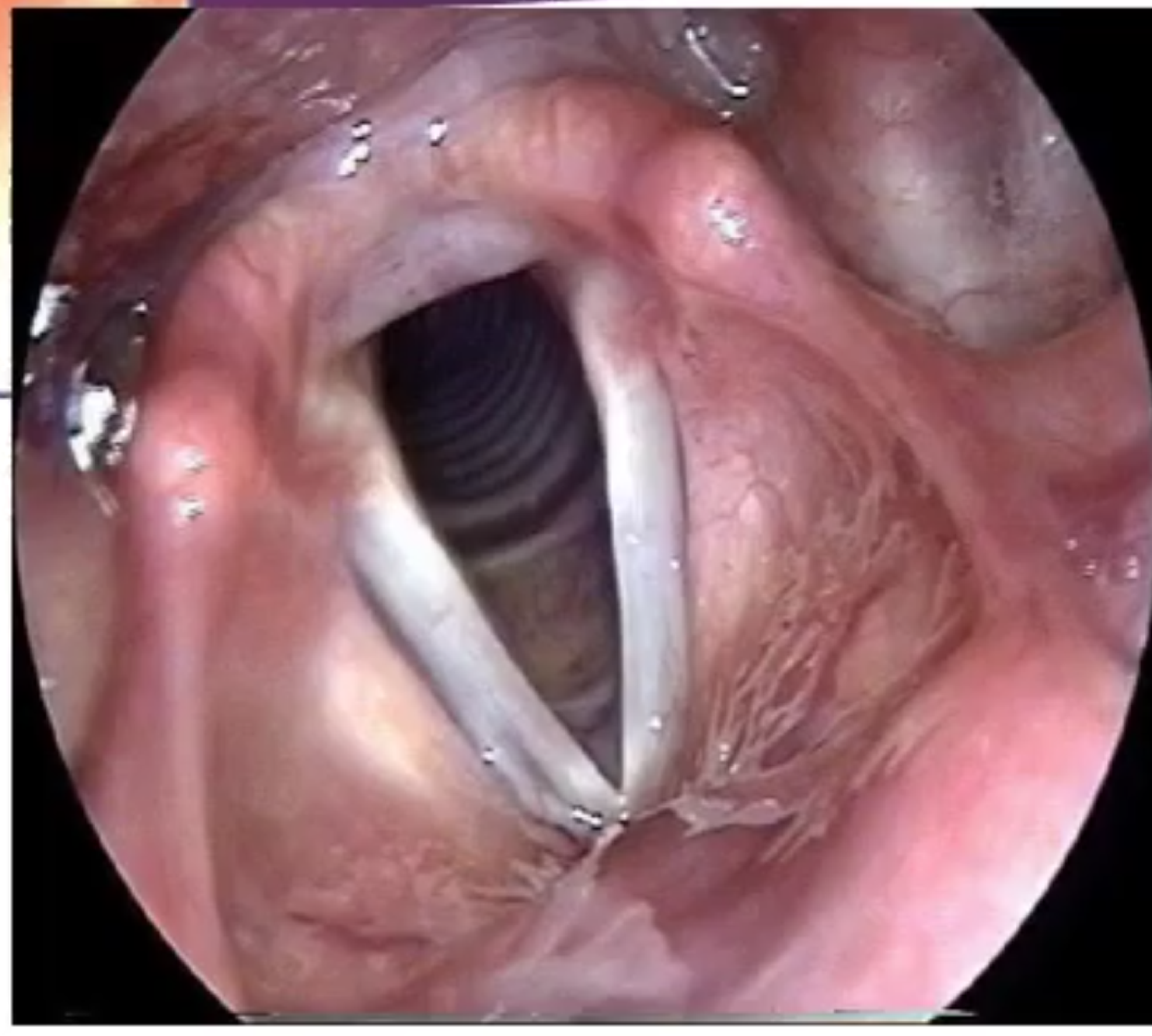

Tongue
Vestibular fold
Ventricle
Vocal fold
Piriform recess
Posterior wall of pharynx
Epiglottis
Vallecula
Epiglottic tubercle
Ary-epiglottic fold
Trachea
Cuneiform cartilage
Corniculate cartilage

Flexible fibrooptic nasopharyngolaryngoscopy





Direct laryngoscopy



NORMAL LARYNX

Acute laryngitis :

<2 weeks inflammatory changes in laryngeal mucosa.

Etiology (more common in the winter months) :

1- Viral : influenza , adenovirus .

2-Bacterial : group A streptococcus .

3-Mechanical acute voice strain –sub mucosal .

4-Hemorrage – vocal cord edema –{hoarseness}.

Clinical features :

1-URTI symptoms

2-Hoarseness

3-Aphonia

4-Cough attacks

5-Dyspnea

6- Stridor (rare)

True vocal cord erythematous/edematous with vascular injection and normal mobility .

Predisposing factors :

1- URTI

2- Overuse of the voice

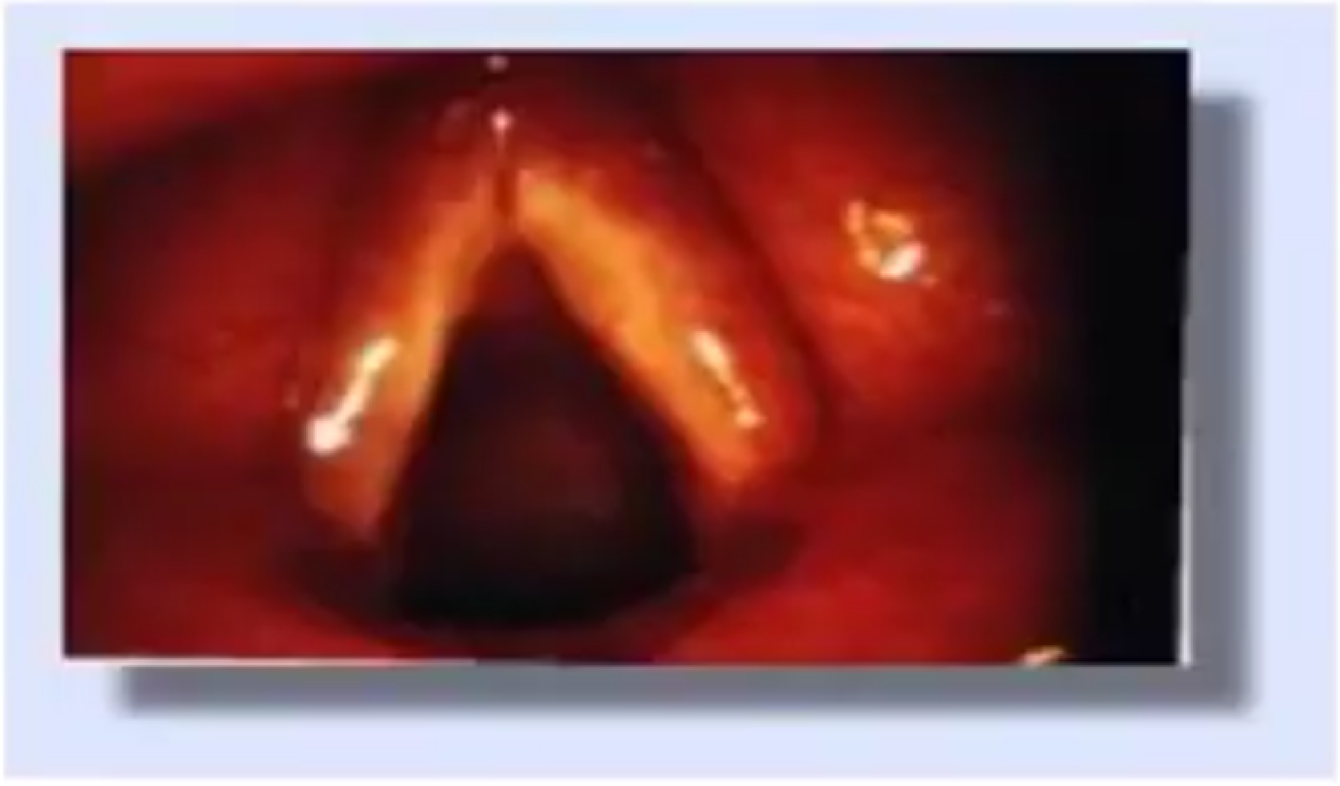
3- Smoking (active or passive)

4- Alcohol

Treatment

- Usually self limited resolves within 1 week
- Voice rest
- Humidification
- Hydration
- Avoid irritants (smoking)
- Antibiotics if there is evidence of bacterial laryngitis.

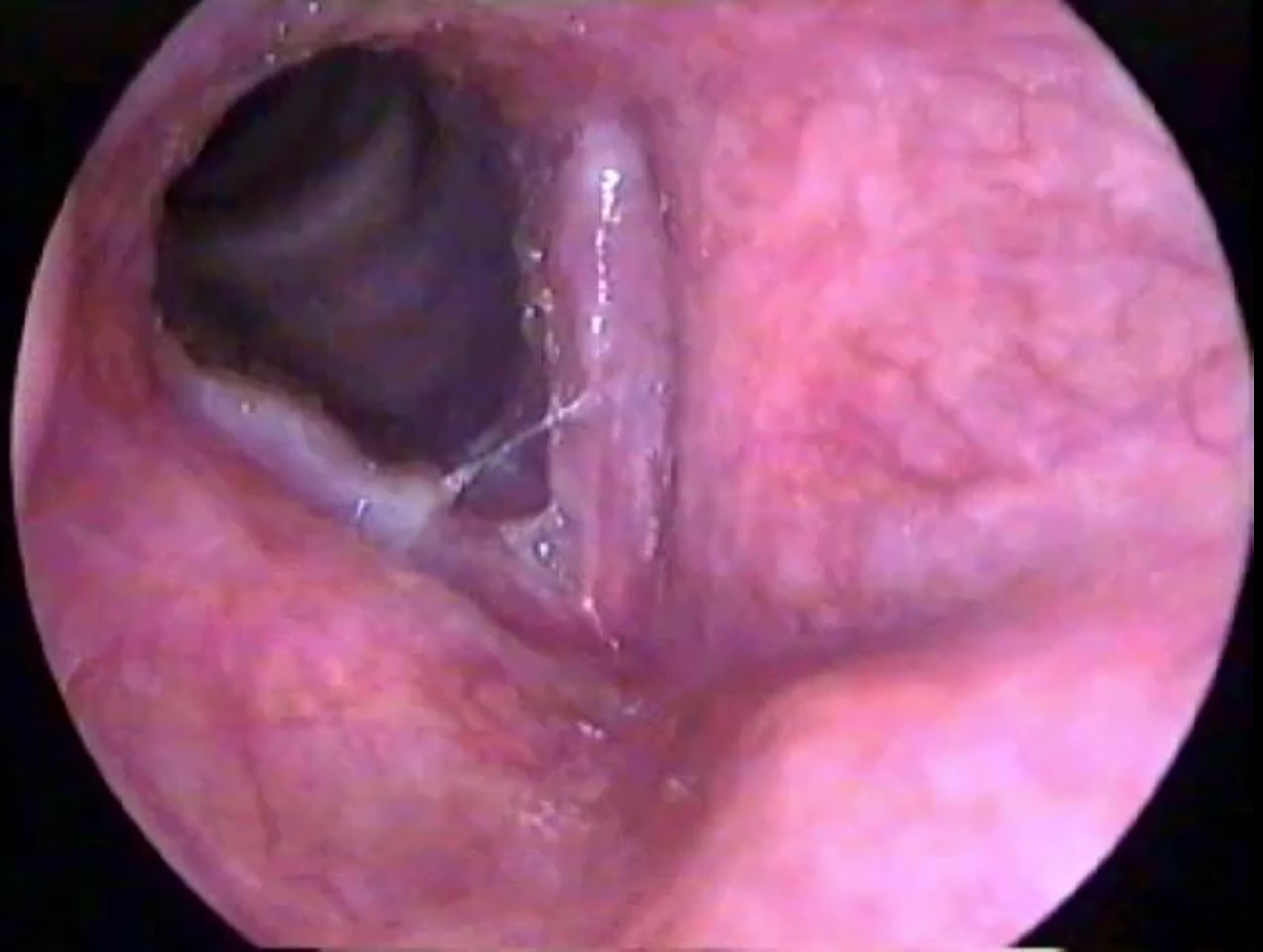
Acute laryngitis



Viral

Hypervascularity

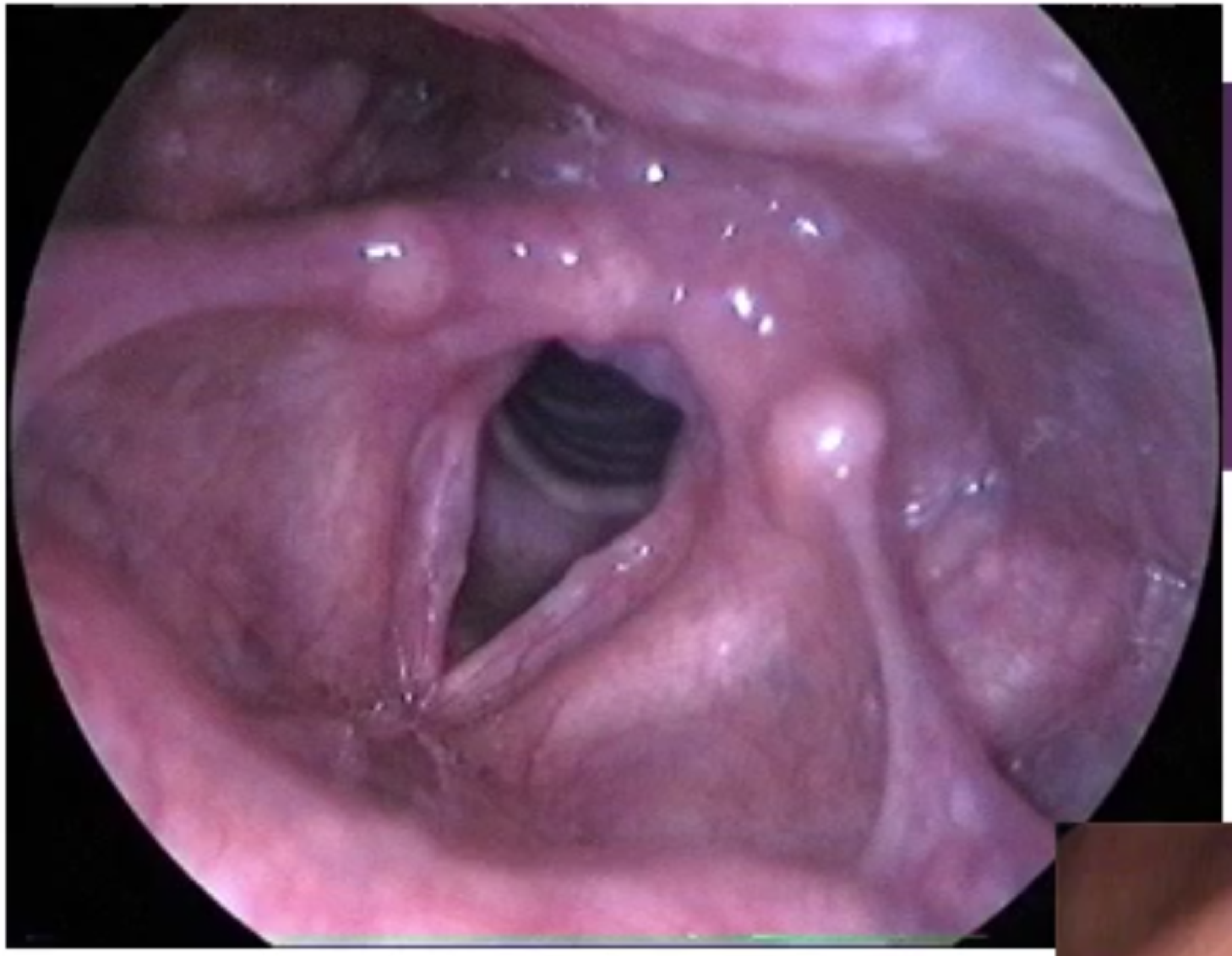

www.otorhinolaryngologyportal.com

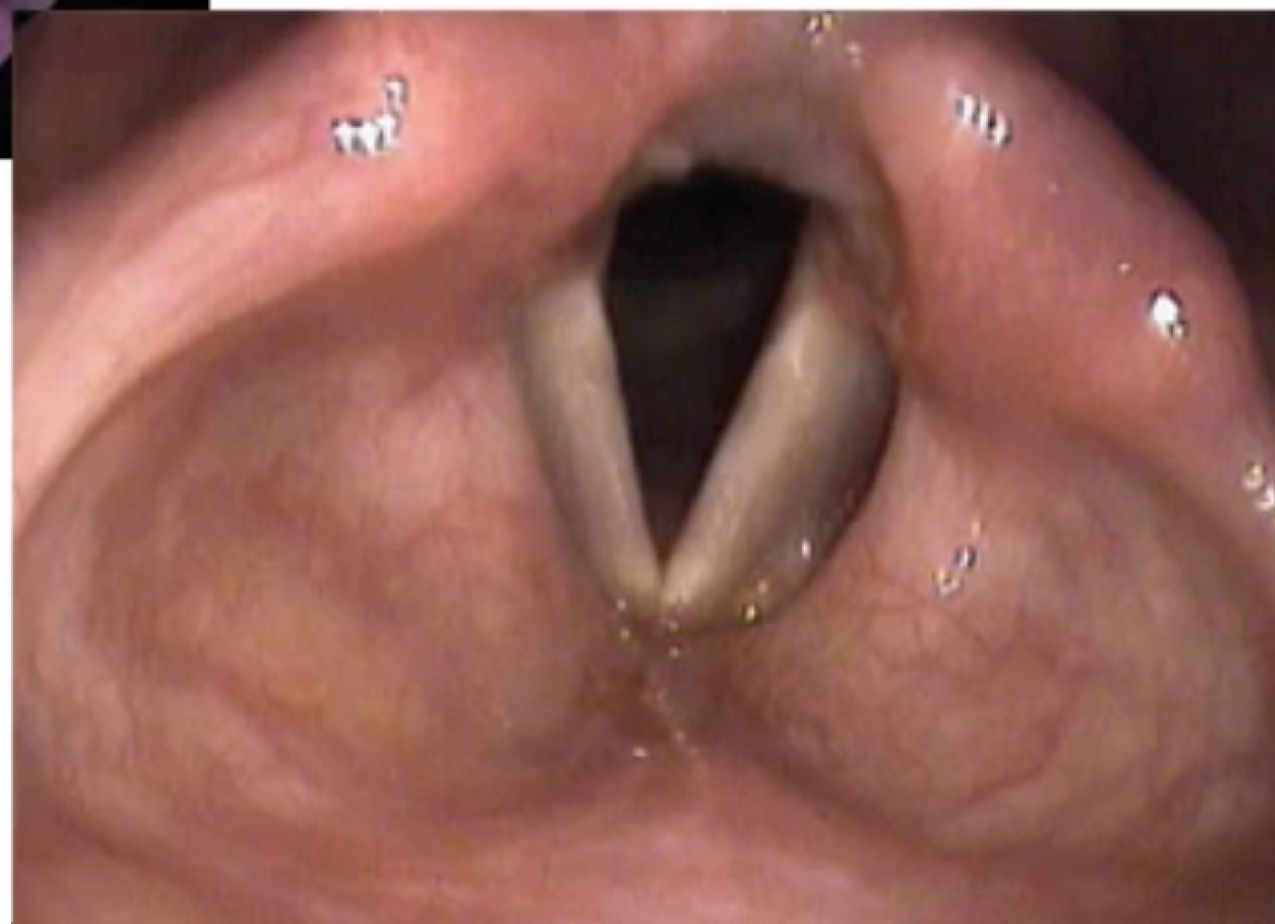


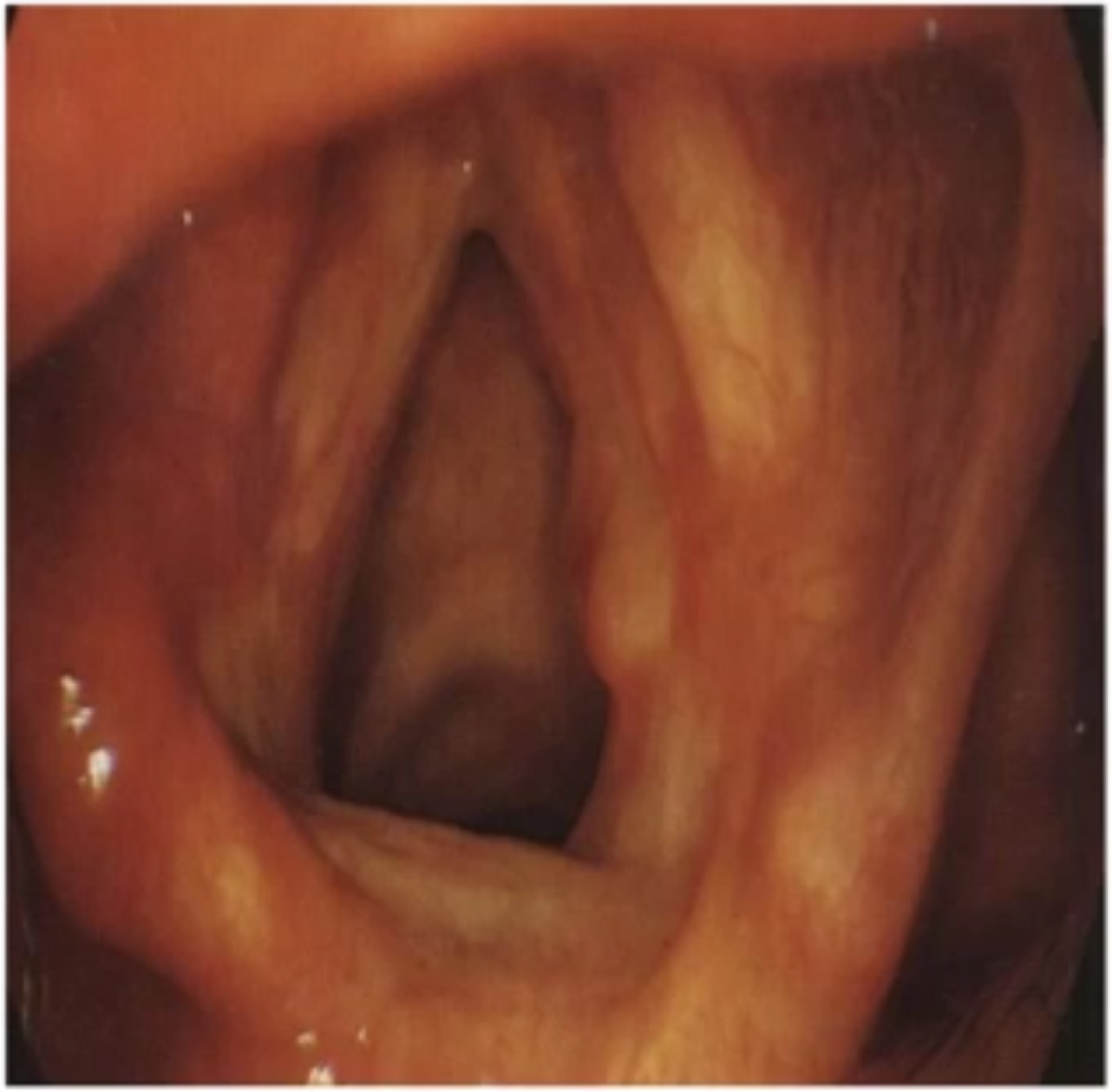
Chronic laryngitis

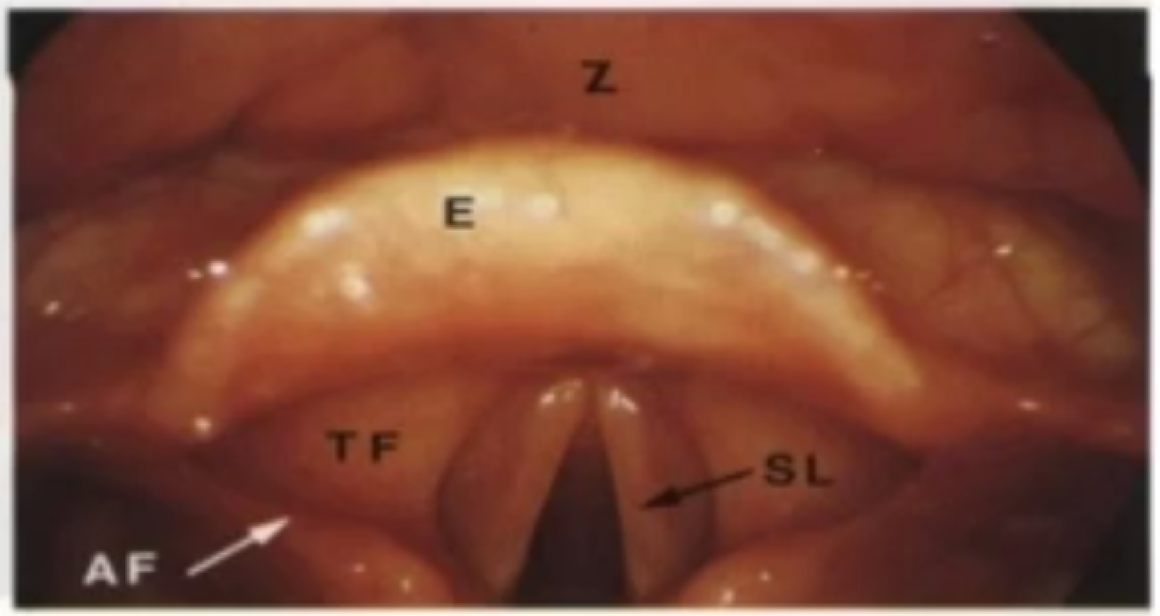
>2 weeks inflammatory changes in laryngeal mucosa.

- Etiology:
- 1st Most common is smoking & 2nd is GERD
- Recurrent acute laryngitis
- Chronic voice strain
- Chronic sinusitis with post nasal drip
- Chronic alcohol use
- Systemic : allergic , hypothyrodism .







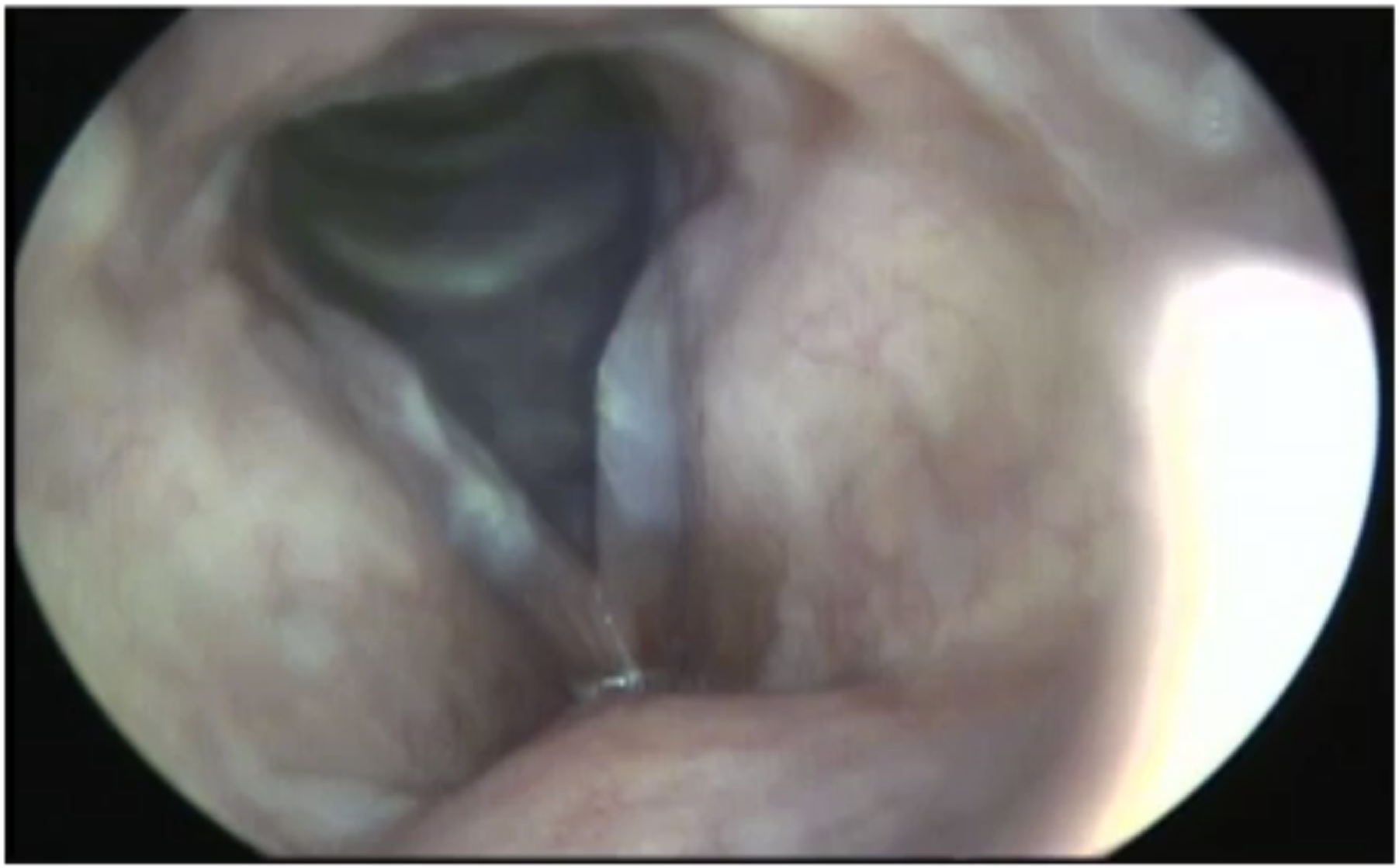


Chronic laryngitis

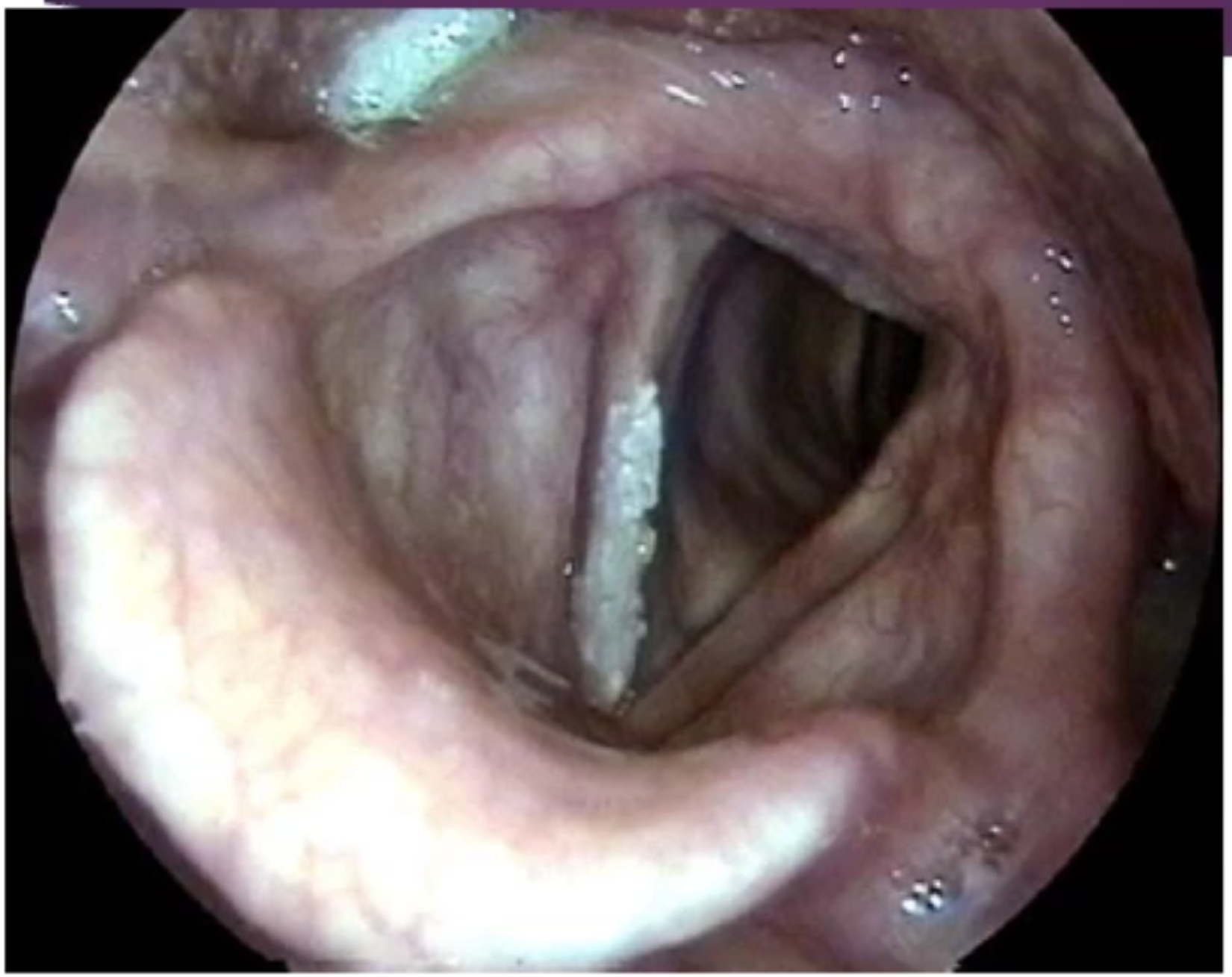
hypertrophic))

Normal larynx

SMOKER WITH CHRONIC LARYNGITIS & LEUKOPLAKIA



LEUKOPLAKIA OF Vocal cord



Leukoplakia or 'white plaque' noted on the vocal folds. This is due to accumulation of keratin and some of the time is associated with cellular abnormalities of the vocal folds

Vocal cord lesions

Benign (noncancerous) growths that include nodules, polyps, and cysts. All can cause hoarseness and are typically associated with vocal overuse or vocal cord trauma.

VOCAL CORD POLYPS

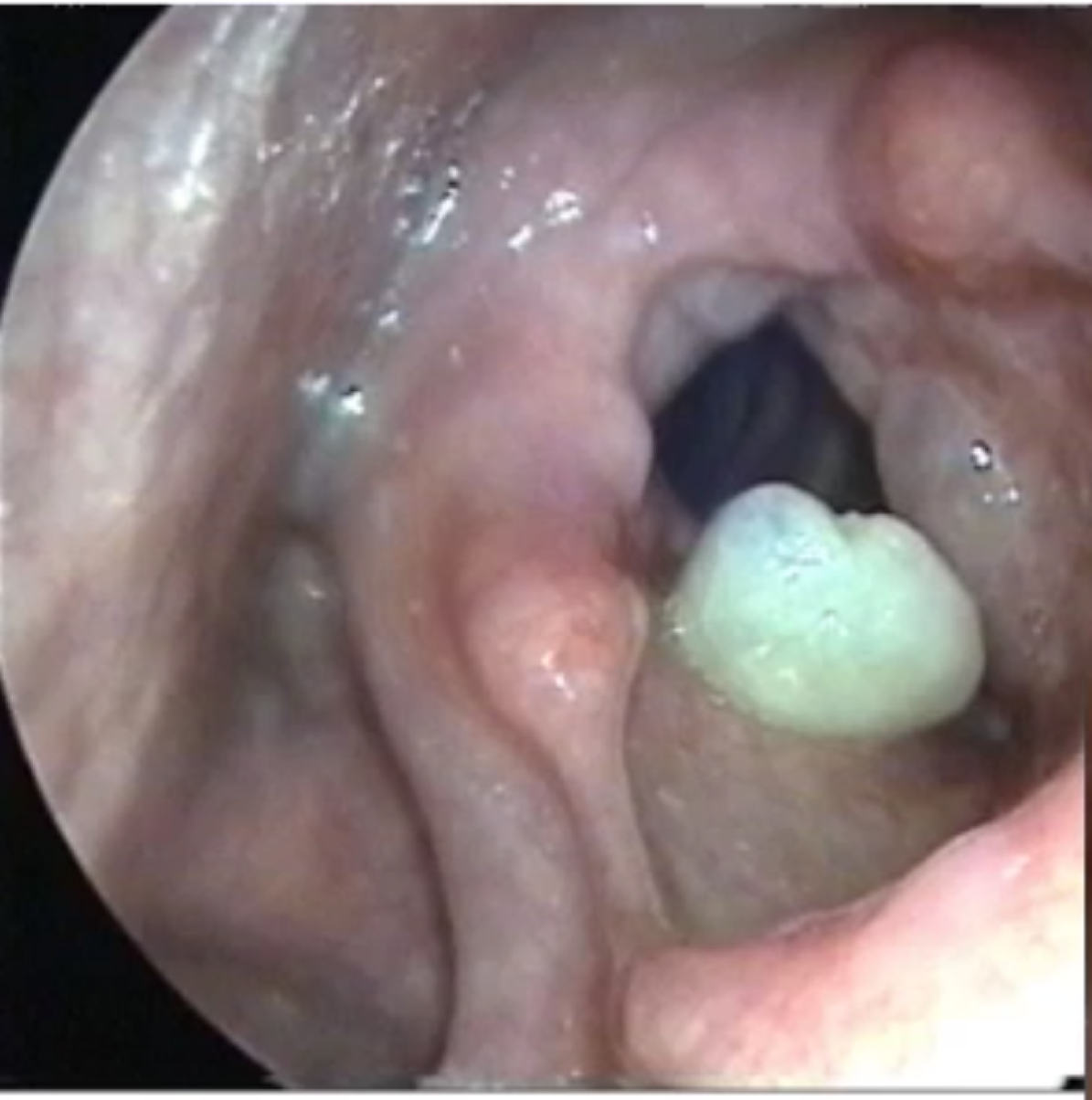
-Most common benign tumor of vocal cords

There is usually irritation of vocal cords such as smoking , GERD , alcohol . .

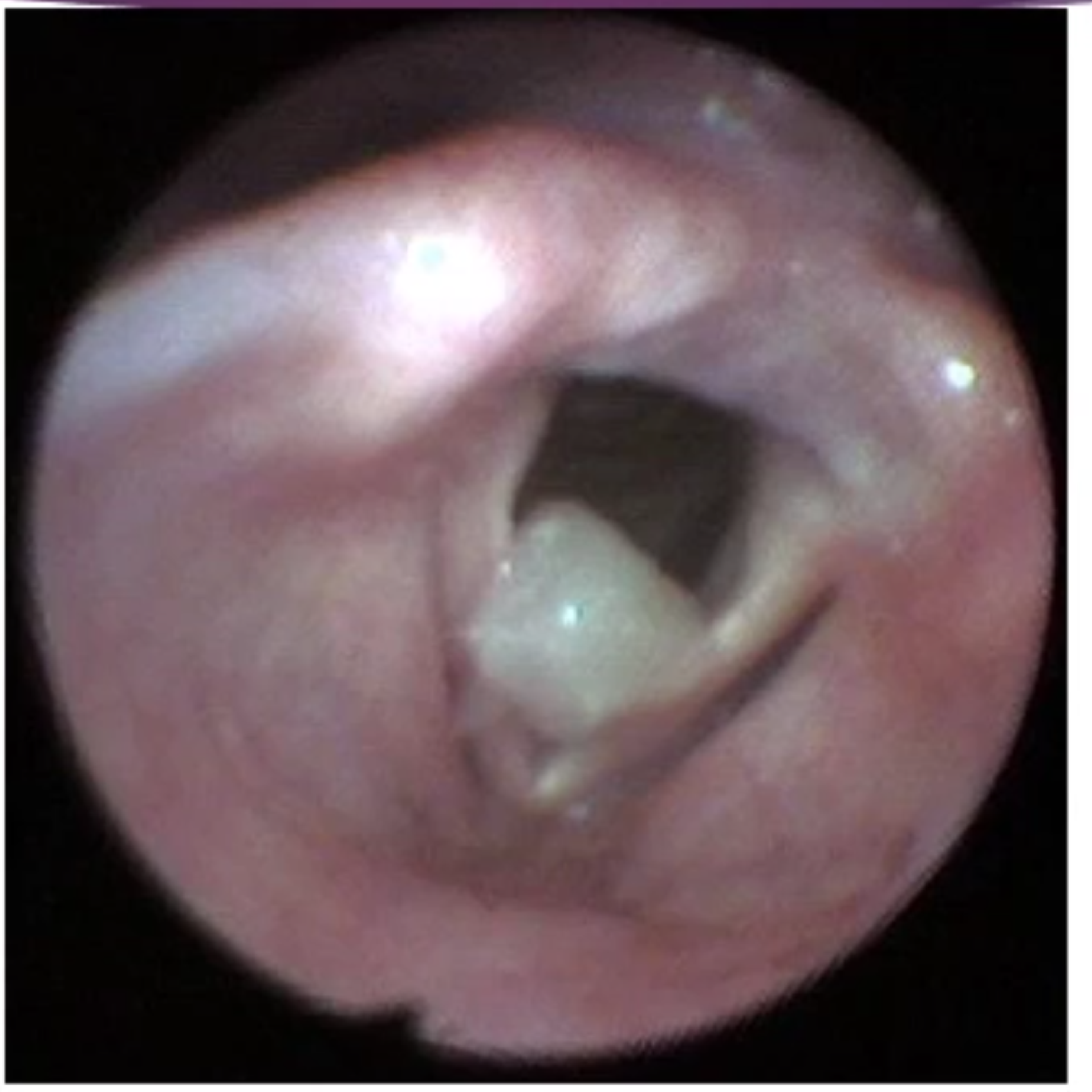
-usually unilateral however it can be bilateral

-It doesn't have a classical site

-management: is stop smoking or alcohol, anti reflux medication, vocal cord rest and the patient may need operation -



LARYNX VENTRICULAR POLYP



VOCAL CORD NODULES (singer nodule)

The cause of it usually vocal abuse (the usual risk factor of it) .. because it may cause subepithelial haemorrhage then it becomes fibrosis which is the nodule .

-The classical site of it on the junction between the anterior one third of the vocal cord with the posterior 2/3 of it , however it can occur anywhere .

-usually it is bilateral but it can be unilateral

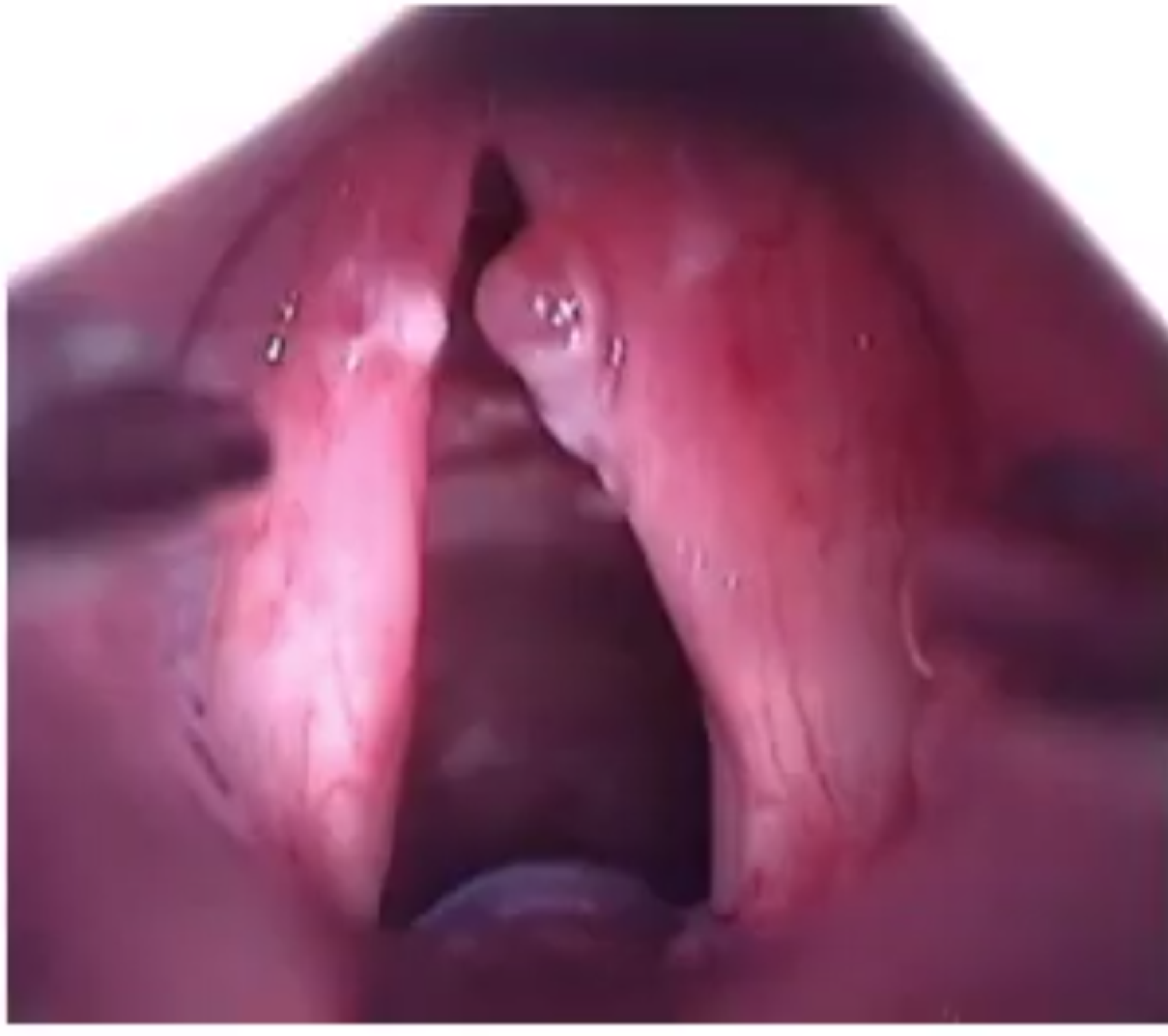
-Management of it: is vocal cord rest , speech therapist -90% of the patients improves by this management

VOCAL CORD NODULES

On laryngoscope :

Red , soft nodules (acute)

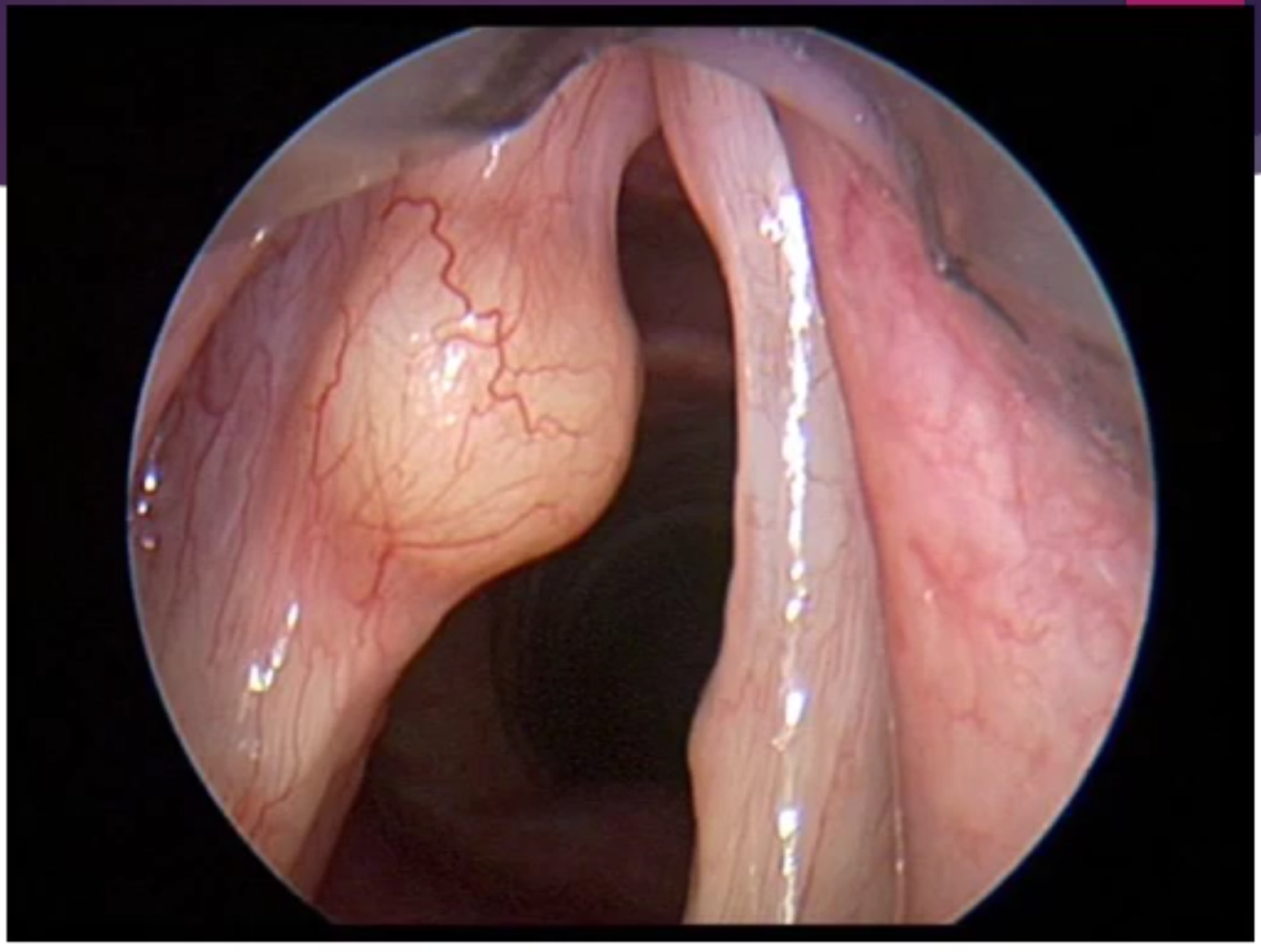
Chronic nodules become fibrotic, hard , white.



	Vocal cord polyps	Vocal cord nodules
Pathogenesis :	structural manifestation of vocal cord irritation. Acutely polyp forms due to capillary damage in the subepithelial space during extreme voice exertion	-Early nodules occur due to submucosal hemorrhage -Mature nodules from hyalinization occure with long term voice abuse.
Presentations :	30- 50 y.old .. Hoarsness , aphonia ,cough, dyspnea Pedicled polyp on free edge of cord.. Soft , asymmetrical, more common in anterior 1/3 of the vocal cord ,most unilateral .	In singers childrens ,teachers Hoarseness worse at end of day Often bilateral , at junction of anterior 1/3 and posterior 2/3 of vocal cords (maximal point vibration).
Causes:	-Voice strain (muscle tension dysphonia) -Laryngeal irritation (GERD ,allergy, smoke).	-long term voice abuse. -Frequent URTI ,smoke , alcohol.
Management:	-Avoid irritant.	-Voice rest (4 weeks)

TRUE VOCAL CORD CYST

sac around a fluid–filled or semisolid center. These are less common than vocal cord nodules and polyps. There are 2 types of vocal cord cysts, mucus retention cysts and epidermoid (or sebaceous) cysts.



Recurrent respiratory papillomatosis (RRP)

Characterized by :

-the development of exophytic warty lesions, primarily within the larynx, but which may be found in the nose, pharynx, and trachea.

-is benign but associated with significant morbidity and

mortality.

- Caused by **HPV mostly** by benign serotypes of the virus (6,11) but sometimes it is caused by the malignant types (16,18)

There is a bimodal distribution;

juvenile-onset :

-by vaginal delivery from the cervix

-is generally diagnosed between the ages of 2 and 4 years

And is more aggressive than adult-onset disease

adult-onset disease,:

-by sexual

- peaks in the third decade.

Clinical Findings

Papillomas typically appear as multiple, friable, irregular warty growths in the larynx. These lesions particularly affect the "true" and "false" vocal cords, but they are also found in other parts of the larynx and upper aero digestive tract.

Presentation depends on the site of the lesion:

*Patients with glottic lesions present with dysphonia;

*those with supraglottic lesions may present with stridor.

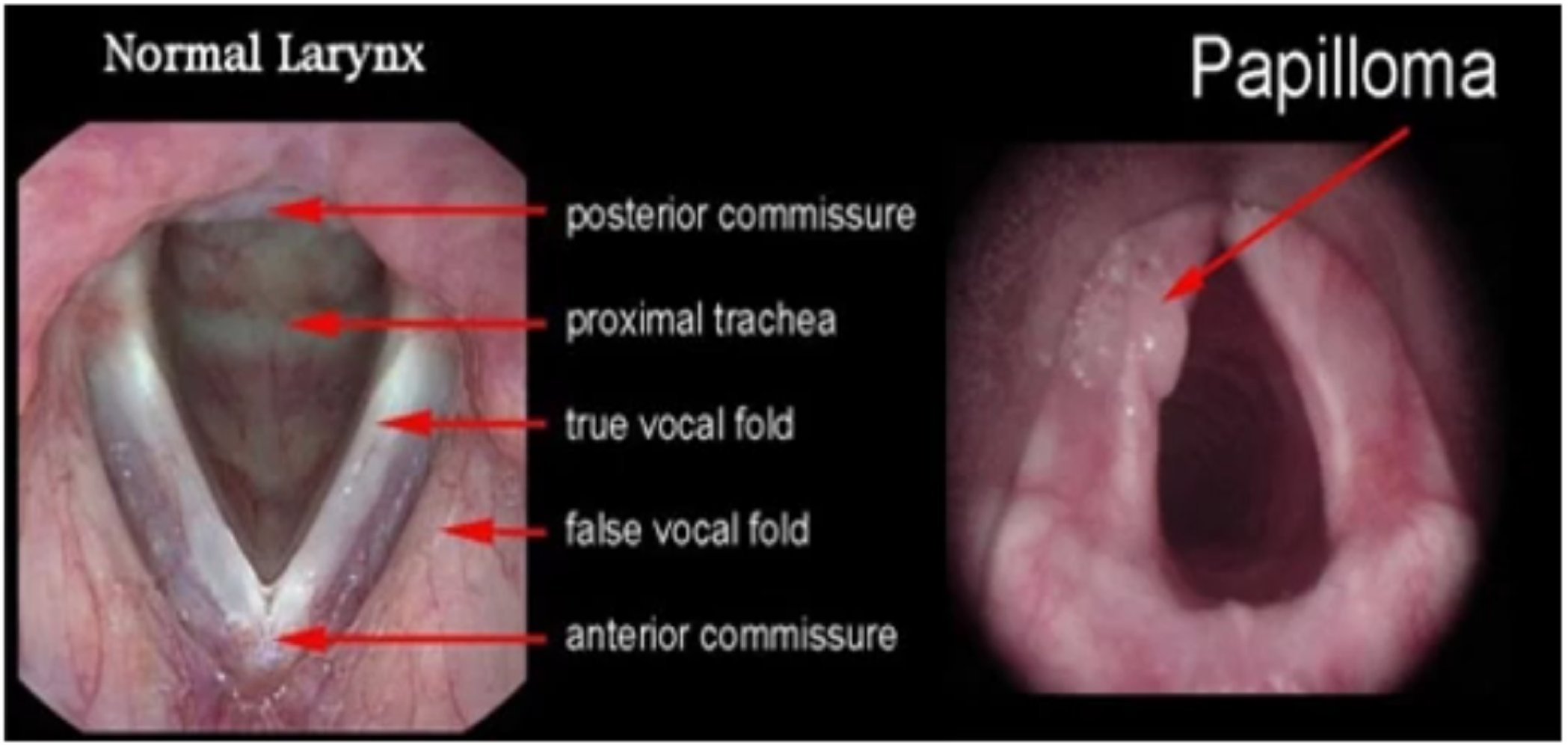
Treatment

HPV cannot be eradicated from the larynx. Even after spontaneous remission, HPV DNA can be detected in otherwise normal mucosa.

The aim of treatment is therefore to remove symptomatic lesions with minimal morbidity. Suitable techniques include CO2 laser resection, cold steel dissection, or use of the laryngeal microdebrider. Tracheostomy should be avoided and is associated with distal airway involvement. Adjuvant treatments include intralaryngeal injection of cidofovir (Vistide).

A vaccine for HPV 6, 11, 16, and 18 is currently undergoing trials, and its introduction could significantly reduce the incidence of RRP.

LARYNGEAL PAPILLOMATOSIS



Vocal cord paralysis

Unilateral : weak breathy voice

Bilateral : respiratory is compromised & may present as stridor .

Causes :

- **1–Neoplastic** : neoplams in thyroid gland.. esophagus .. larynx ..lymph nodes or any thing that can invade vocal cord or laryngeal nerves
- 2– **Traumatic mostly iatrogenic trauma** to vocal cords or laryngeal nerves such as thyroidectomy ,parathyroidectomy , lymph node dissection , tracheal surgery , laryngeal surgery ,esophageal surgery , arch of aorta surgeries , patent ductus arteriosus surgery , cervical surgery by anterior approach.
- 3– **Others** : cricoaryteniod joint arthritis (stiffness)next to vocal cord , DM by mononeuritis multiplex which lead to recurrent laryngeal nerve inflammation .. viral neuritis

Left Vocal Cord PARALYSIS

REFLUX LARYNGITIS

Is an irritation in the back of the throat due to acid or other chemicals that come up from stomach .

***typical symptome include :**

Hoarseness , a sensation of lump ,

excessive need to clear the throat ,non produvtive cough

Heart burn

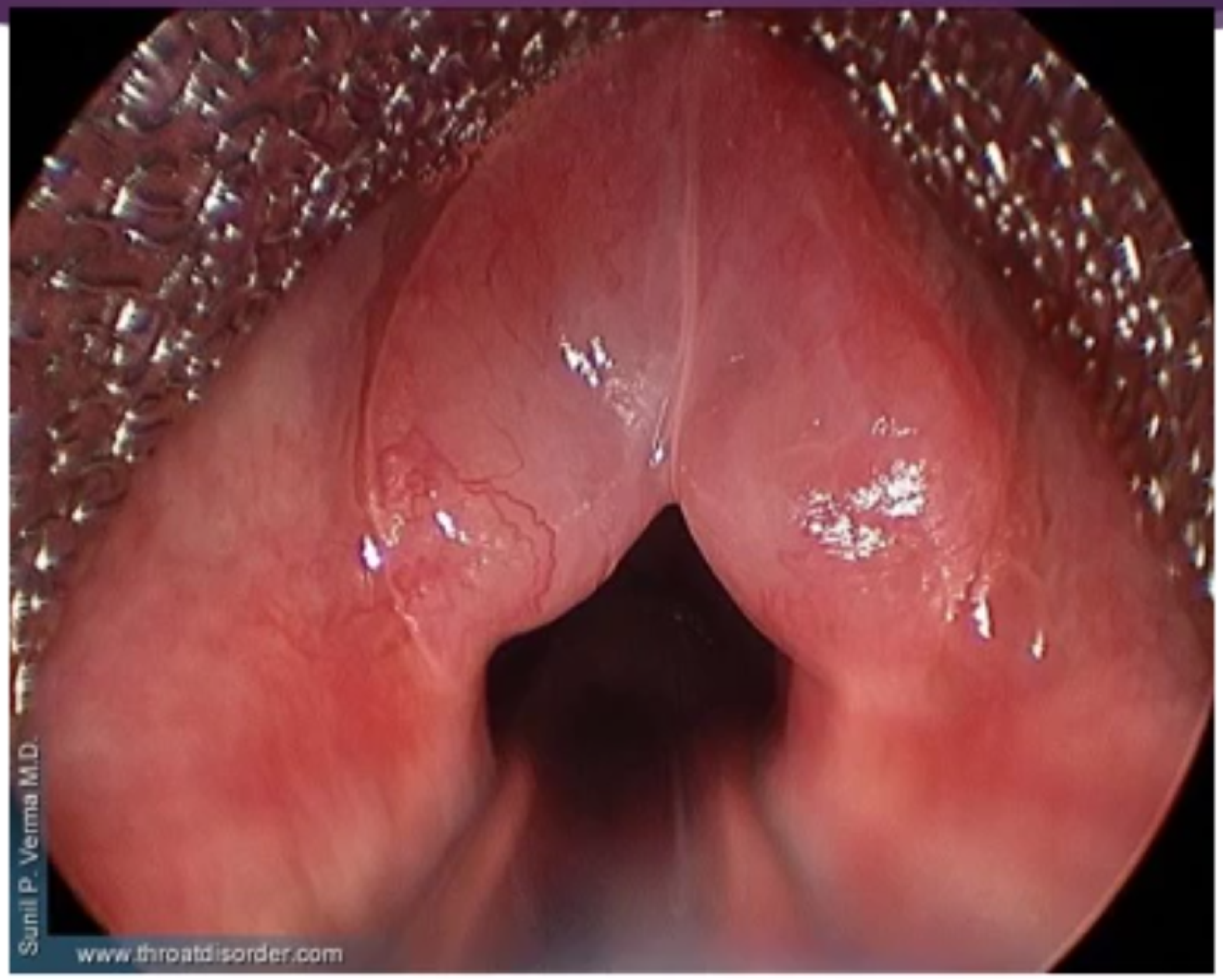
Tratment :

1.Life style change

2. Medication

3. Surgery (fundoplication)

Reinke's edema



Its the swelling of the vocal folds due to fluid collection (edema) in superficial lamina propria of vocal folds (Reinke's space)

Symptoms :

Dysphonia, dyspnea , hoarseness ,sac like appearance

***risk factor :**

Smoking , GERD ,Hypothyrodism

Treatment :

1. Eliminate /control risk factor that causing the disease
2. Surgery (micro laryngoscopy)

Epiglottitis (supraglottitis)

-severe rapid inflammation within few hours

-edema of epiglottis and larynx.

-Usually It affects children between 1-4 years .

-Haemophilus influenzae type B (HIB) is the responsible pathogen in most cases

- rare nowadays due to vaccine for H. influanze Type B

Symptoms :

- Rapid progression of symptoms.
- Severe odynophagia with drooling of sliva
- Irritability, fever, toxicity, or any combination of these symptoms.
- Stridor (late sign).

lateral neck soft tissue X-ray we may see **the thumb sign**.

Treatment :

The management of a child with suspected epiglottitis

requires close cooperation among the otolaryngologist, the

anesthesiologist, and the pediatrician. The child should bedirectly transferred to the operating room where equipment

for emergency tracheotomy must be available. After

inhalational anesthesia, the supraglottis can be inspected

and the presence of erythema and edema confirms the

diagnosis. The airway is then secured by endotracheal intubation.

Once the airway is safe, blood cultures and swabs

of the supraglottis can be obtained and an intravenous cannula

inserted. Parenteral antibiotic therapy (eg, ceftriaxone

or cefotaxime) should then be started. Supraglottitis usually

responds rapidly to treatment and extubation is often

possible after 48–72 hours.

LARYNGOMALACIA

LARYNGOMALACIA

is common in paediatrics (it is in 10% of all neonates at birth)

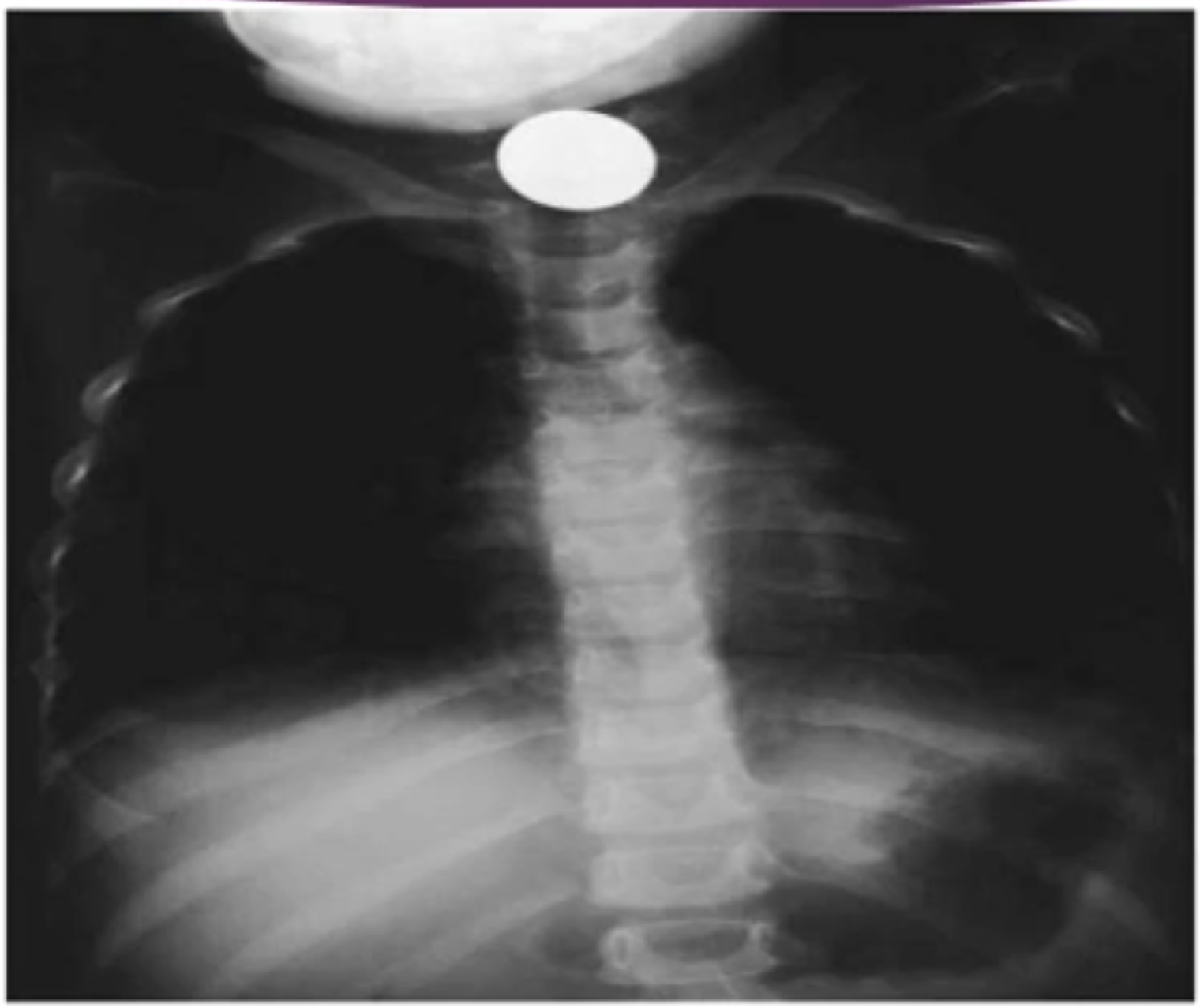
laryngeal cartilages are not hard enough .. so they become easily collapsed so they

may have sleep apnea , stridor , shortness of birth , weak cry , poor feeding . we can diagnose it by direct laryngoscope we will see **omega shape larynx**

LARYNGEAL WEBS

LARYNGEAL CLEFTS

F.B. INGESTION



Laryngeal carcinoma

Glottic > Supraglottic > Subglottic.

Mostly squamous cell carcinoma. 95%

M:F-10:1. mean age 45-75 years.

Main risk factor is smoking.

Other risk factors have been identified

HPV infection which results in

laryngeal papillomatosis, usually benign, but subtypes16,18 are known to degenerate into SCC. Genetics ,nutritional deficiencies, previous neck irradiation ,GERD ,alcohol.

Histological types

SQUAMOUS CELL CARCINOMA

SALIVARY GLAND CANCERS

SARCOMAS

Neuroendocrine tumors ;carcinoid tumors, lymphoma, metastases,

C. SARCOMAS

Malignant growths of mesenchymal origin are rarely seen in the larynx. The most common is chondrosarcoma.

Chondrosarcoma of the larynx arises most often from the cricoid cartilage and is characterized by a submucosal mass of the posterior glottis with stippled calcification on CT Scan

Signs and Symptoms

Glottic > hoarseness.

Supraglottic > dysphagia.

Subglottic > airway problem usually stridor

- odynophagia,
- otalgia ,
- Dyspnea ,
- cough , hemoptysis
- Cervical nodes
- Weight loss

Supraglottic cancers, however, typically

present at a more advanced stage because tumors are bulkier (ie, at a higher T stage) before voice changes, dysphagia, airway compromise, or aspiration become apparent.

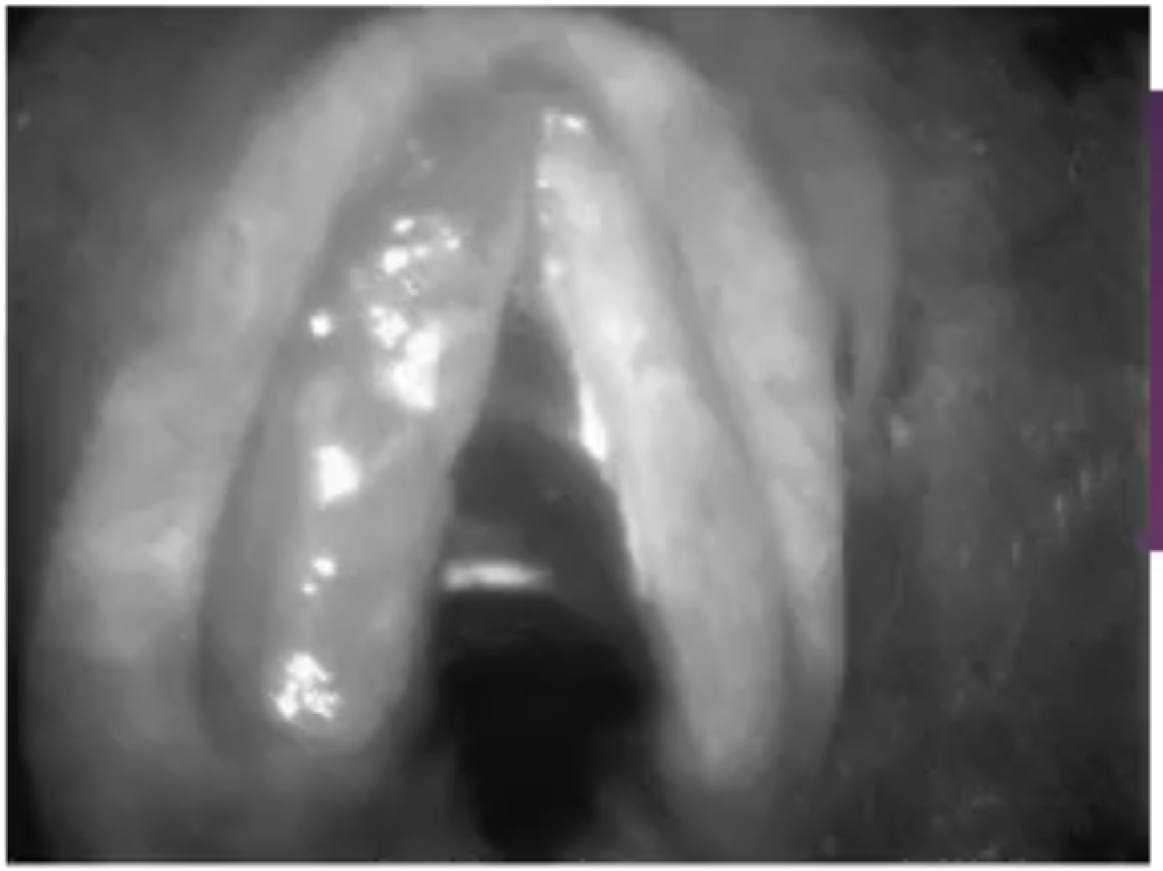
Because the supraglottis has a richer lymphatic supply, supraglottic primary lesions tend to metastasize earlier and are more often diagnosed at the advanced N stage.

Investigation

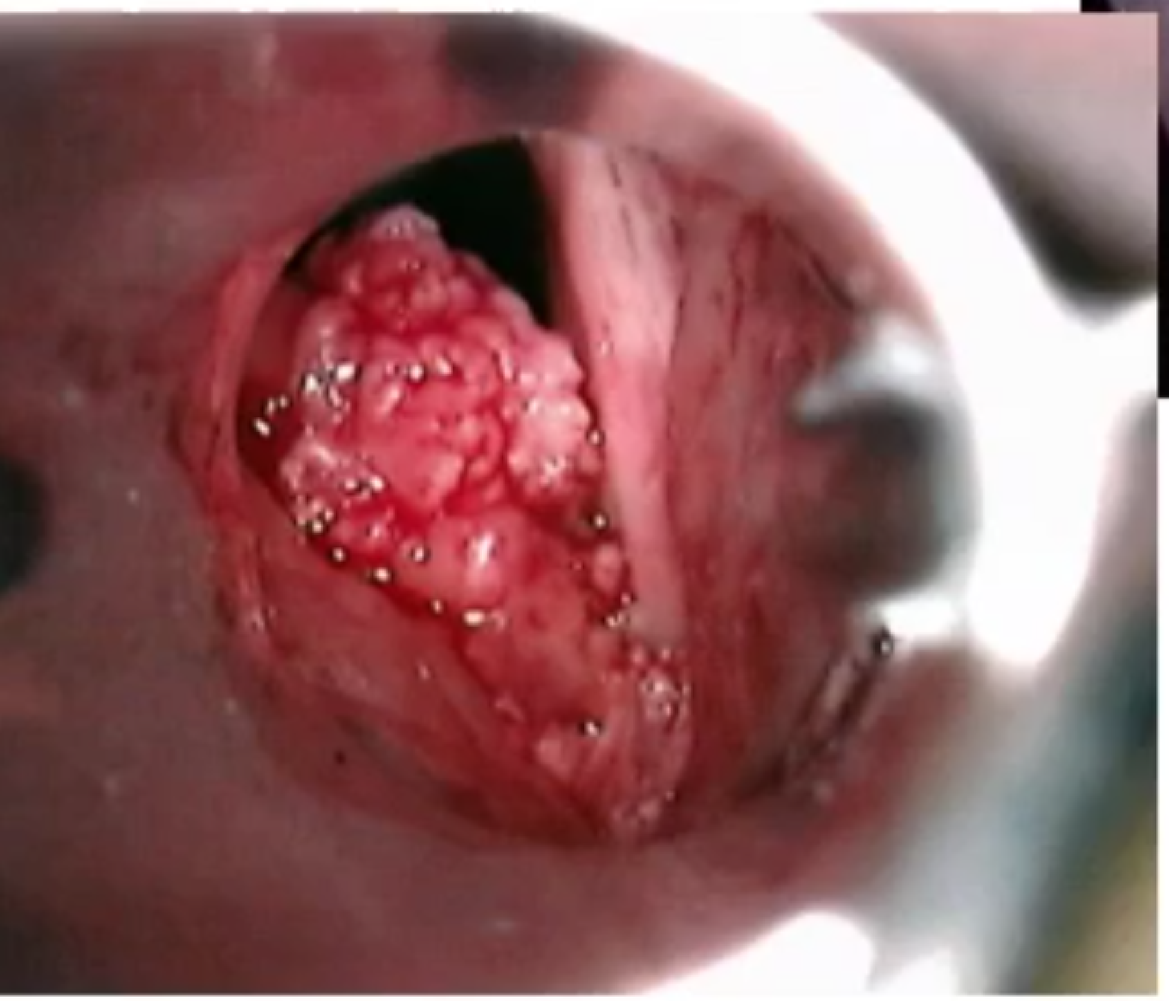
Laryngoscopy

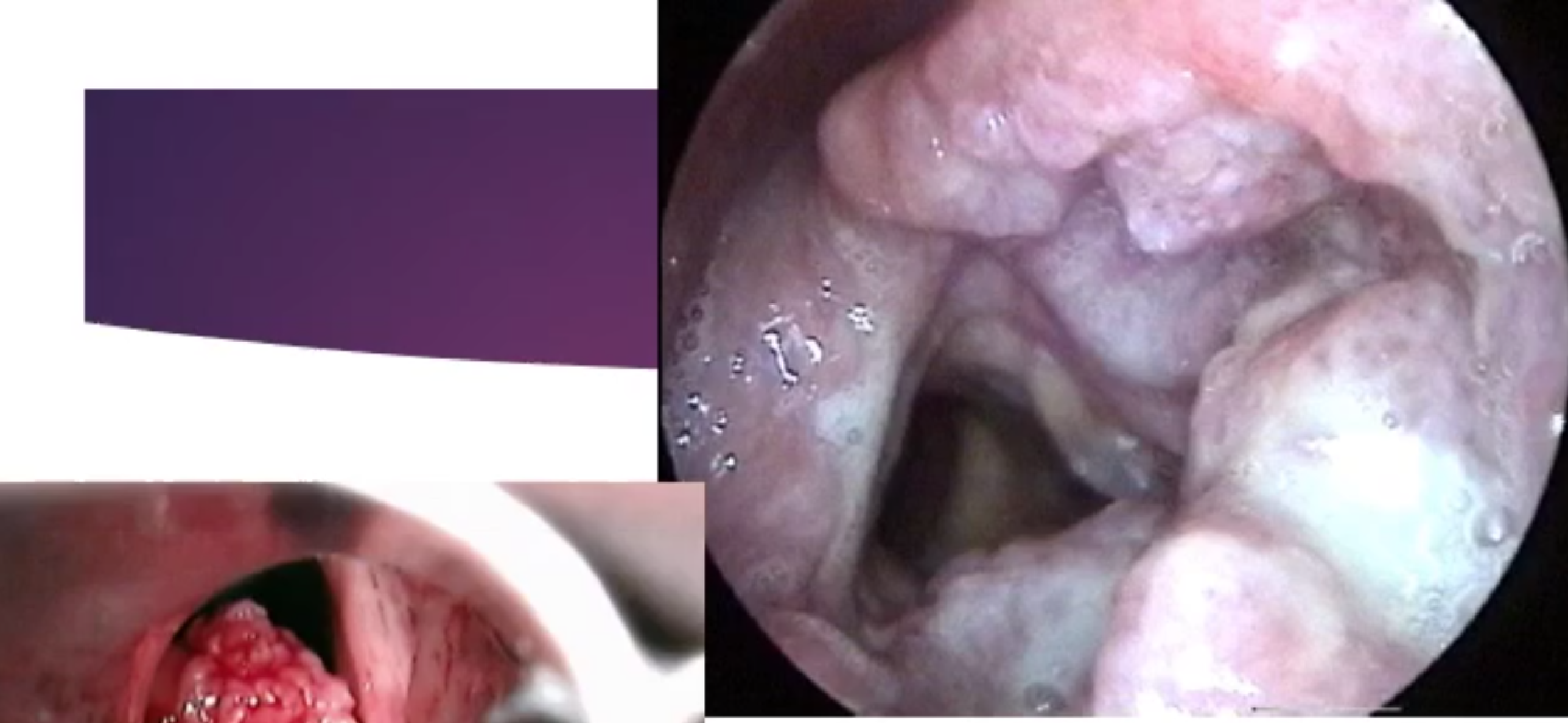
CT / MRI

CXR



Laryngeal carcinoma





Supraglottic CA

BOTH VOCAL CORD TUMOR

TRUE & FALSE VC CA

Treatment

- Treatment depends on TNM stage.
- Radiotherapy.
- Surgery.
- Chemotherapy.
- Tracheostomy.
- Speech valve.

Early stage "1, 2": radiation.

Stage 3: surgery vs chemo radiation.

Stage 4: surgery with possible post op radiation

In general, chemotherapy in head and neck cancer is used as adjuvant therapy with surgery or radiation, not used as primary therapy."

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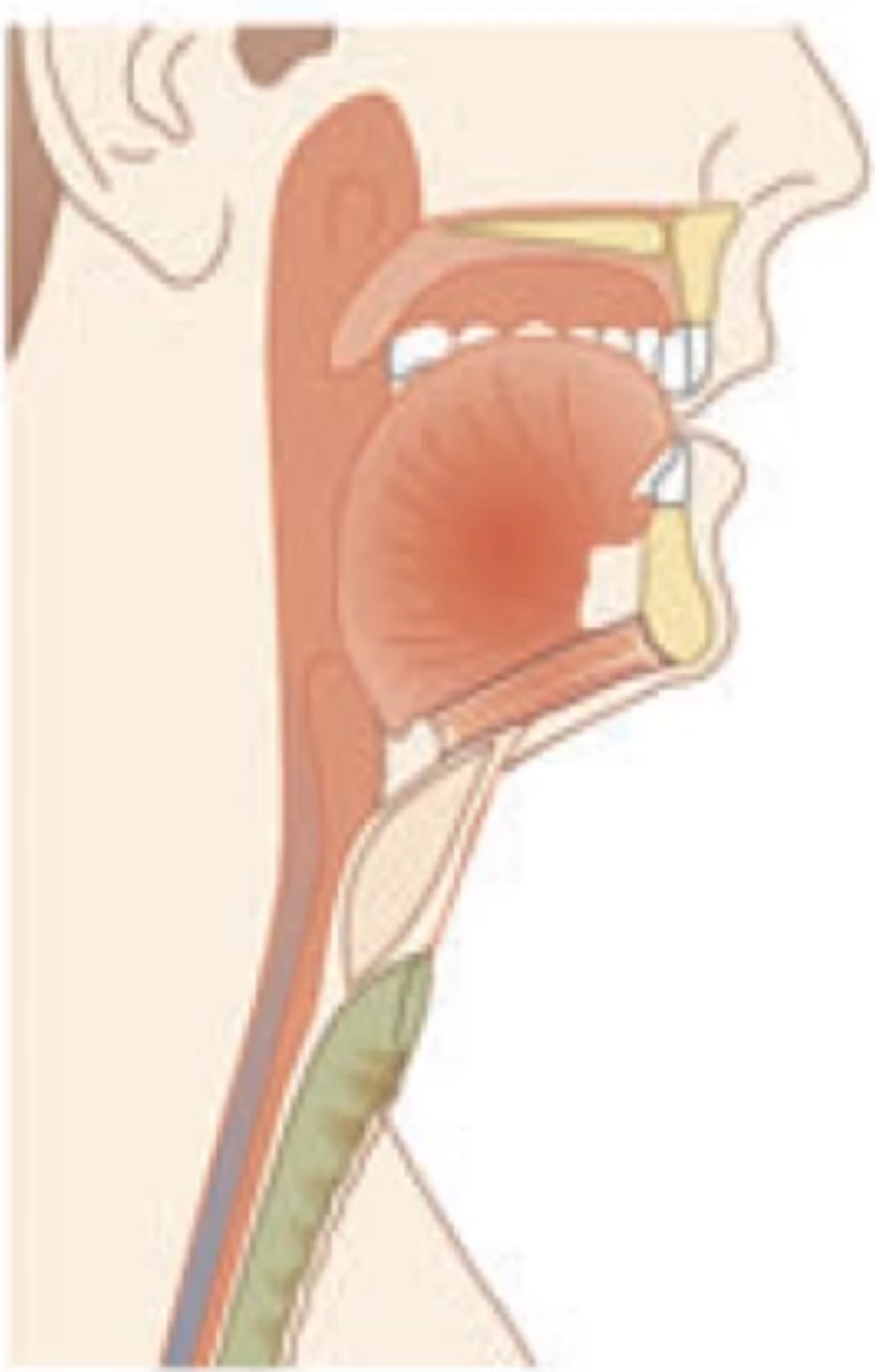
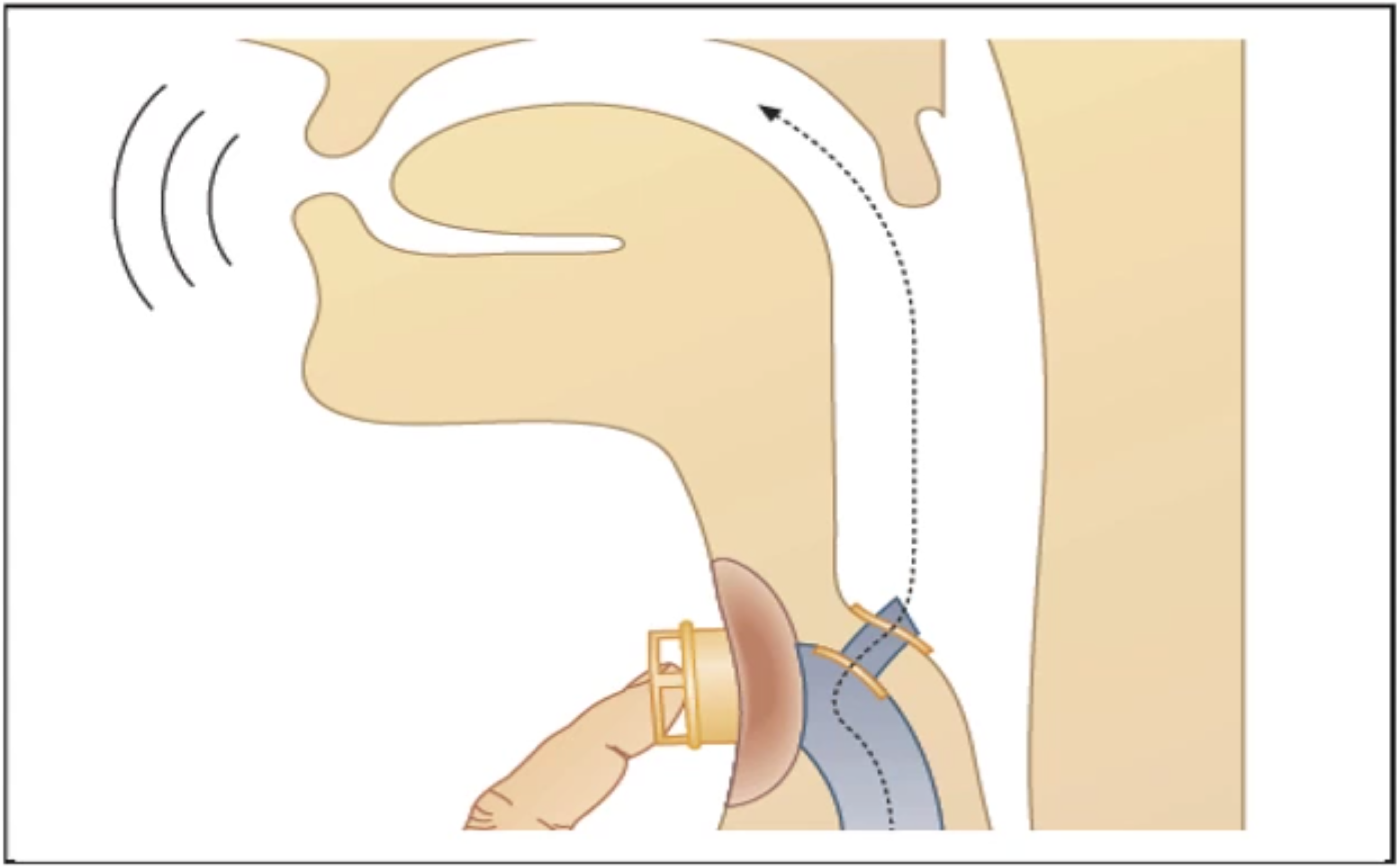
Before laryngectomy



After laryngectomy

Fig. **Speech valve prosthesis**



Principle of a speech valve prosthesis for voice rehabilitation after laryngectomy, illustrated here for a Provox valve.