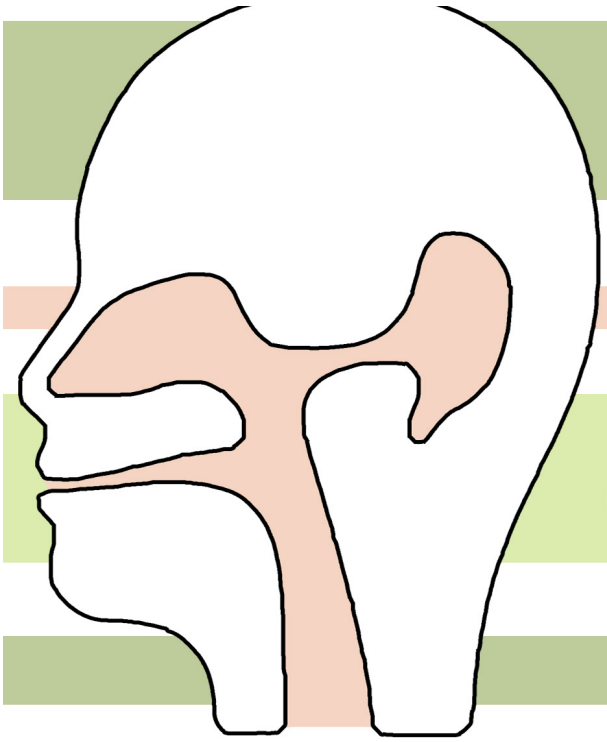


EAR, NOSE AND THROAT

(16) Larynx II

Leader: Maha Allhaidan

Done by: Hind Almuhaya

Revised by: Maha Allhaidan

Doctor's note Team's note Not important Important 431 teamwork

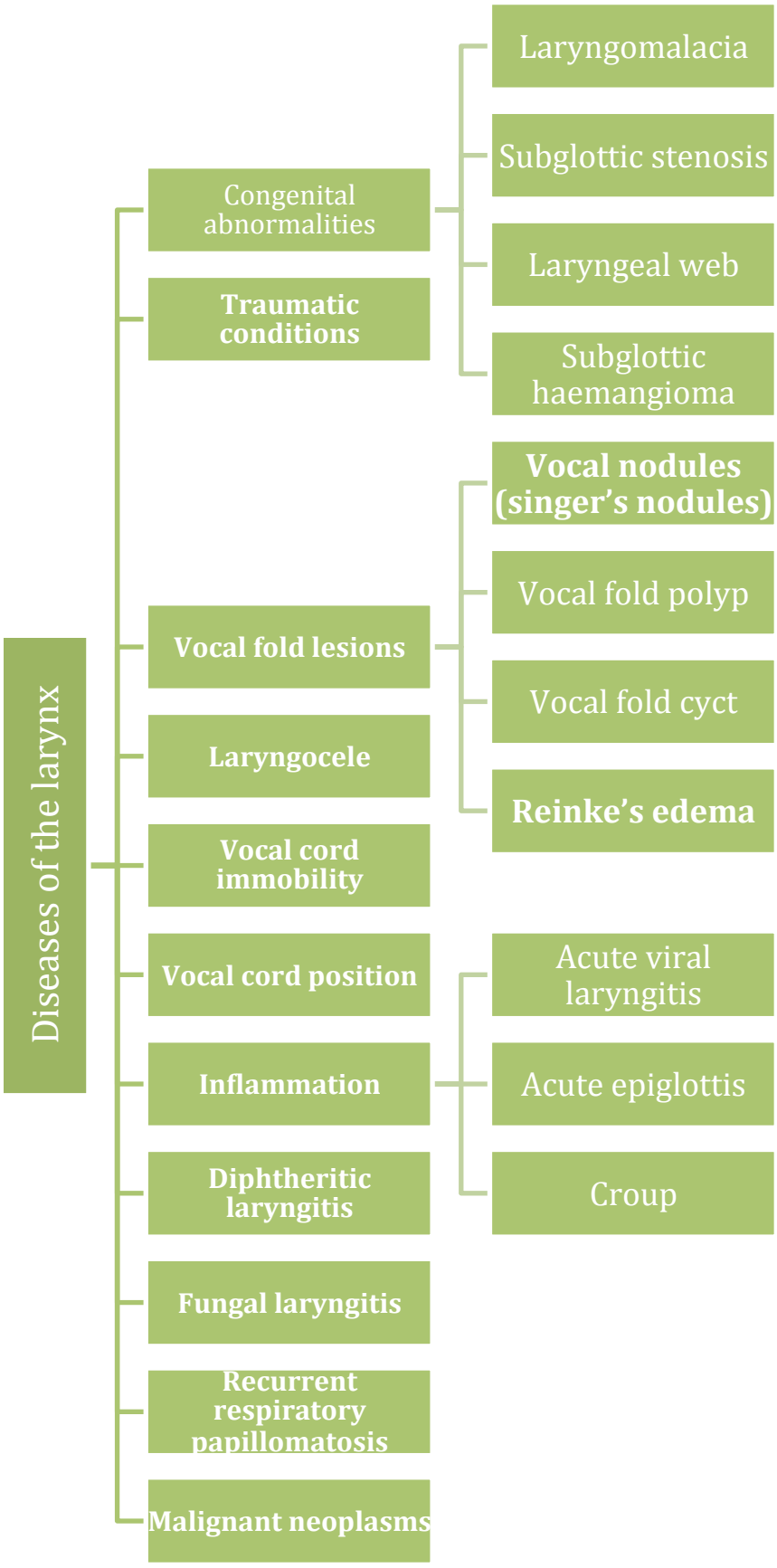
(431 teamwork do not highlight it in yellow, but put it in a yellow "box")

Objectives:

To know

- Congenital diseases of the larynx (in brief) (laryngomalacia, web, subglottic stenosis, and hemangioma)
- Benign swelling of larynx (Singer's nodule, polyps, granuloma, J. L. papillomatosis)
- Acute and chronic laryngitis
- Non-specific laryngitis
- Specific laryngitis (acute epigllotitis, croup)
- Laryngeal paralysis (unilateral and bilateral)

Mind Map


Diseases of the larynx
Congenital abnormalities
Laryngomalacia
Subglottic stenosis
Laryngeal web
Subglottic haemangioma
Traumatic conditions
Vocal fold lesions
Vocal nodules (singer's nodules)
Vocal fold polyp
Vocal fold cyct
Reinke's edema
Laryngocele
Vocal cord immobility
Vocal cord position
Inflammation
Acute viral laryngitis
Acute epiglottis
Croup
Diphtheritic laryngitis
Fungal laryngitis
Recurrent respiratory papillomatosis
Malignant neoplasms

Congenital abnormalities of the larynx

1) Laryngomalacia

- Most common cause of stridor in neonate and infants

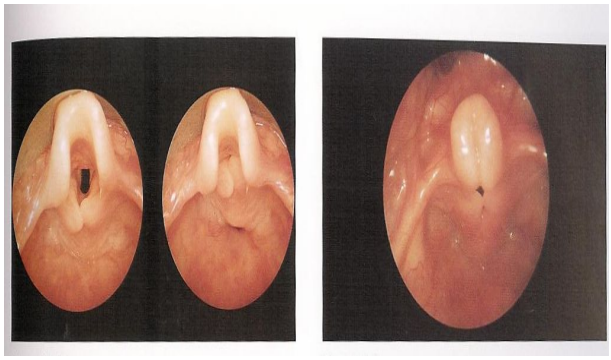
Most common laryngeal anomaly.

Pathophysiology: immature cartilage, omega shaped epiglottis

Management: observation, epiglottoplasty, correct GERD if present.

- **Laryngeal finding:**
  - Inward collapse of aryepiglottic fold (short) into laryngeal inlet during inspiration
  - Epiglottis collapses into laryngeal inlet.
- **SSX:**
  - **Intermittent inspiratory stridor** that improve in prone position.
- **DX:**
  - HX and endoscopy "flexible endoscope through the nose" it can't be diagnosed in the OR when the patient is sedated
- **RX:**
  - Observation
  - Supraglottoplasy
  - Epiglottoplasty
  - Tracheostomy

Omega shaped epiglottis →



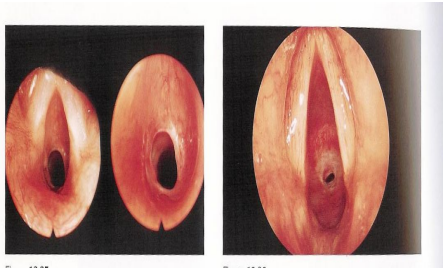
Normally in inspiration:
The epiglottis is open and vocal cords are abducted

2) Subglottic stenosis

Can be acquired " most common" or congenital

Acquired: due to **prolonged intubation**

Incomplete recanalization, small cricoid ring



- **Types:**
  - Membranous
  - Cartilaginous
  - Mixed
- **Grades:**
  - I <50%
  - II 51-70%
  - III 71-99%
  - IV complete obstruction (no detectable lumen)

- **SSX:**

- Biphasic stridor " during inspiration and expiration "
- Failure to thrive

- **DX:**

Chest and neck X-ray, flexible endoscope

- **RX:** tracheotomy

Grade I - II	Grade III –IV
Endoscope (CO2 or excision with dilation) "Ballon"	Open procedures: -LTR "laryngotracheal reconstruction" or CTR - Ant cricoid split

3) Laryngeal web

Patient with Anterior laryngeal web → dysphonia

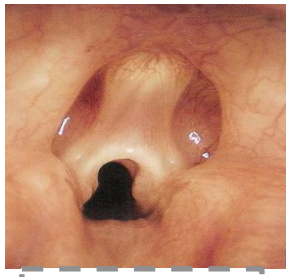
Patient with Posterior laryngeal web → dysphonia and stridor

Incomplete decanalization

- **Types:**
  - Supraglottic
  - Glottis
  - Subglottic

- **SSX:**

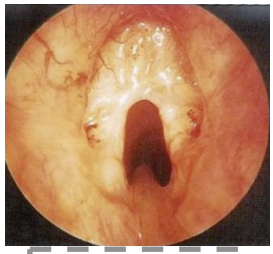
- Weak cry at birth
- Variable degrees of respiratory obstruction
- On and off stridor



Congenital

- **DX:** Flexible endoscope

- **Rx:**
  - No treatment
  - Laser excision
  - Open procedure + tracheostomy

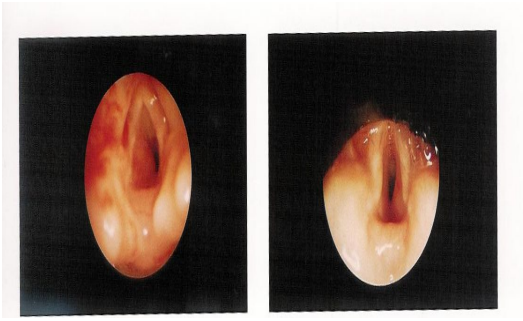


Iatrogenic

4) Subglottic haemangioma

Most common in subglottic space
- **50%** of subglottic hemangiomas associated with cutaneous involvement

- **Types:**
  - Capillary (typically resolve)
  - Cavernous



- **SSX:** biphasic stridor

- **DX:** endoscope

- **RX:**
  - Observation
  - Corticosteroid
  - **Propranolol** (to decrease neovascularization)
  - CO2 LASER

Traumatic conditions of the larynx

- Direct injuries (blows)
- Penetration (open)
- Burns (inhalation, corrosive fluids)
- Inhalation foreign bodies

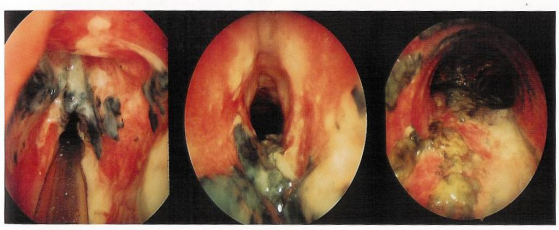
- **Intubations injuries:**
  - Prolonged intubation
  - Blind intubation
  - Too large tube

- **Pathology:**

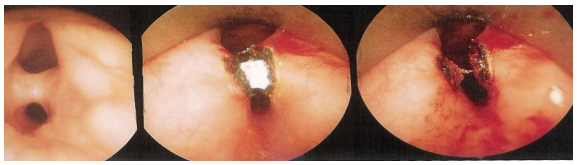
Abrasion ► granulomatous formation ► subglottic stenosis

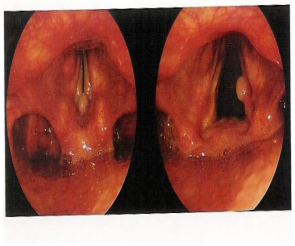
- **SSX:** hoarsness, dyspnea

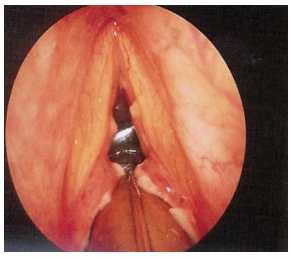
- **RX:**
  - Voice rest
  - Endoscopic removal
  - Prevention



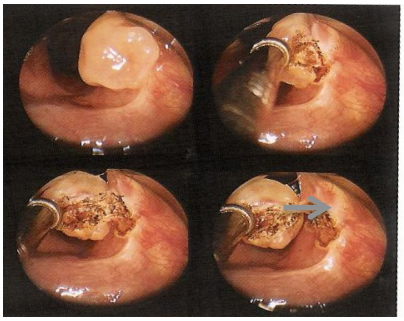
- Inhalation "sloughing and carbonized tissue"
- Give steroid, antibiotic and Anti-Reflux Drugs

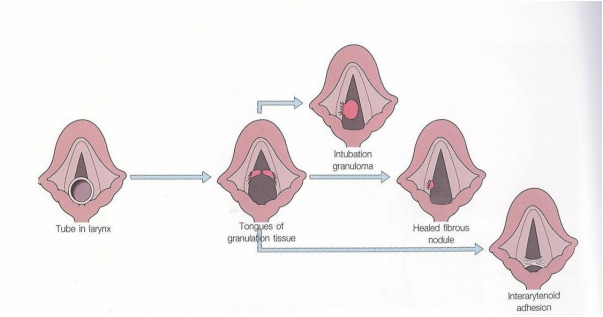






- Granuloma.
Common with intubation or reflux
- Granulomas are benign lesions usually located on the posterior third of the vocal fold "vocal process"





- Big granuloma

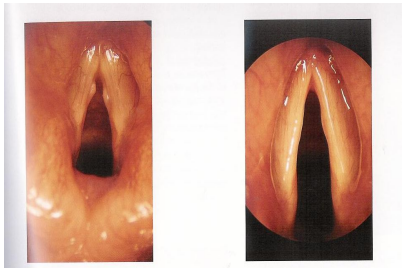
Usually they don't remove it If we remove it --> 40% recurrent

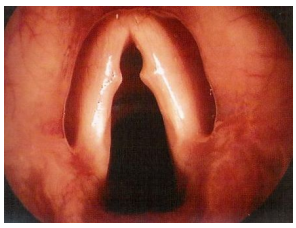
- **Treatment:**

Antireflux treatment, voice rest, lifestyle modifications, steroid therapy, no coffee or late eating

Vocal fold lesions secondary to vocal abuse and trauma

1) Vocal nodules (singer's nodules)



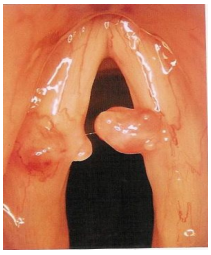


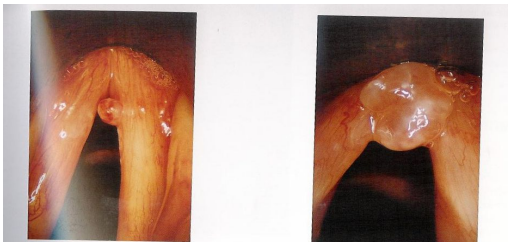
- At junction of ant 1/3 and mid 1/3
  - **RX :**
    - voice therapy
    - surgical excision (microlaryngoscopy)

2) Vocal fold polyp:

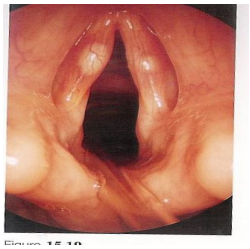
- Middle and ant 1/3, free edge, unilateral (Usually anterior)
- Mucoid, hemorrhagic

  - **RX:** surgical excision





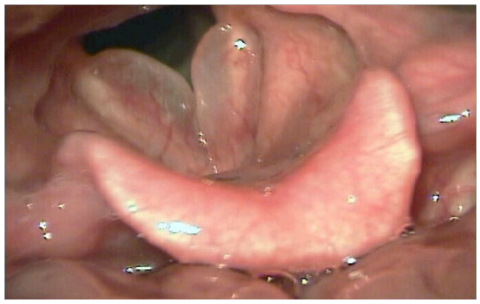
3) Vocal fold cyst:



- congenital dermoid cyst
- mucus retention cyst

- **RX:** surgical excision

4) Reinke's edema



- **RX:**
  - Voice rest, stop smoking, anti reflux therapy
  - Surgical excision

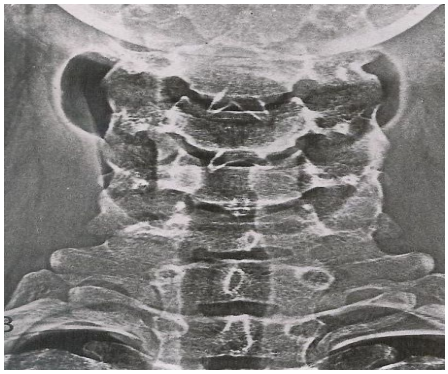
Accumulation of fluid in **Reinke's** space (Common in smokers)

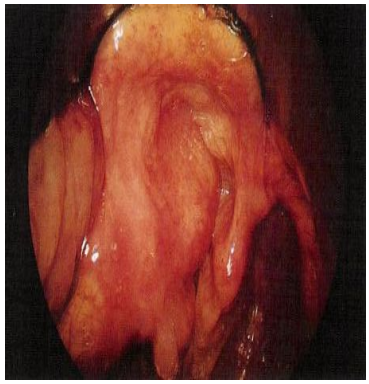
Laryngocele

- Air filled dilation of the appendix of the ventricle, communicates with laryngeal lumen
- Congenital or acquired
- Common site: ventricle

- **Types:**
  - External: through thyrohyoid membrane
  - Internal
  - Combined

- **Rx:** marsupialization





Vocal cord immobility

- Causes:

Adult	
"Iatrogenic" Trauma	Non-iatrogenic trauma
❖ cervical surgery ❖ Thoracic surgery ❖ Skull base surgery ❖ Other medical procedure	❖ Tumor ❖ Medical disease - CVD - Neurological - Developmental abnormalities - Drug neurotoxicty - Granulmatoues dieses ❖ Idiopathic

Children	
Arnold chiari malformation	Birth trauma "Forceps delivery"

- SSX:
  - Dysphonia
  - Chocking
  - Stridor

Vocal cord position

Median, paramedian, cadaveric

- Rx:

Self-limiting or permanent paralysis

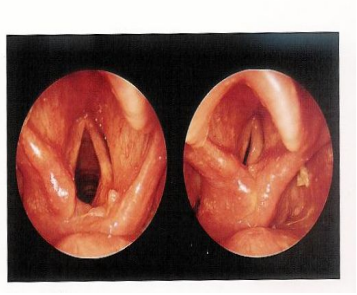
- For medialization:
  - Vocal cord injections
    - Gelfoam, fat, collagen, Teflon.
  - Thyroplasty type 1 silicon block "permanent"

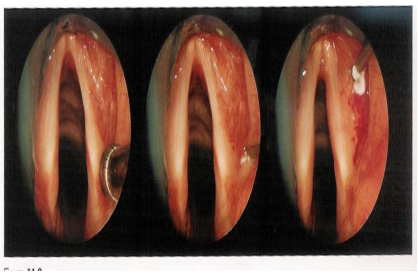
- For lateralization:
  - cordotomy
  - Arytenoidectomy "partial"
  - Tracheotomy

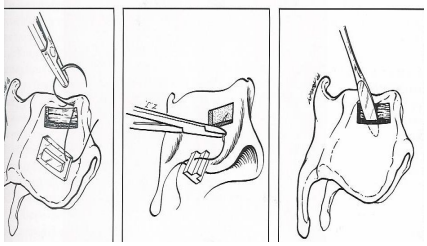
Vocal cord paralysis can be unilateral or bilateral.

Unilateral → one work and the other is paralyzed with gap in between → affect voice "breathy"
Treatment: medialization "inject the paralyzed cord to Inflate it → closure of the gap.

Bilateral → adduction of the cords "can't open" → stridor, voice is fine
Treatment: lateralization



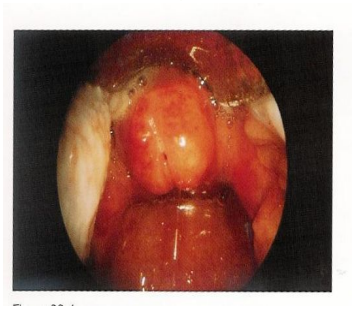


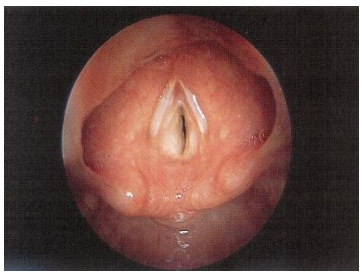


Arytenoidectom

Inflammation of the larynx

	Acute viral laryngitis	Acute epiglottis (important)	Croup (laryngotracheobronchitis)
	- Rhinovirus - Parainfluenza	- Haemophilis influnzae B - 2-6 years	– Primary involves the subglottic – Parainfluenza 1-3 – 1-5 years
SSX	dysphonia, fever, cough	fever, dysphagia, drooling, dyspnea, sniffing position, no cough, normal voice	– biphasic stridor, fever brasssy cough, hoarseness, no dysphagia
DX		x-ray (thumbprint sign)	x-ray, steeple sign
Rx	conservative	– do not examine the child in ER – Intubation in OR – IV abx – corticosteroid "for edema"	– humidified oxygen, racmic epinephrine, steroid





Diphtheritic laryngitis

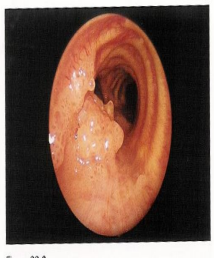
- Causes:
  - Corynebacterium diphtheriae
- Ssx:
  - Cough, stridor, dysphonia, fever
  - Greyish –white membrane
- Treatment:
  - Antitoxin injection
  - Systemic pencillin
  - Oxygen
  - Tracheostomy

Fungal laryngitis

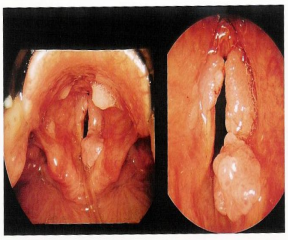
- Immunocompromised
- Candidiasis, aspergillosis
  - Ssx:
    Dysphonia, cough, odynophagia
  - RX: antifungal regimen

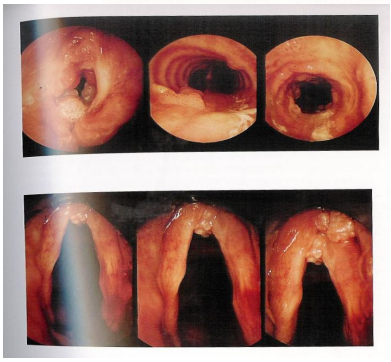
Recurrent respiratory papillomatosis (important)

- 2/3 before age 15
- Rarely malignant change
- HPV 6-11 common
- HPV 16-18 (malignancy)
  - Risks:
    - Younger first time mother (condyloma acuminata)
    - Lesions: wart like (cluster of grapes)



- Types:
  - Juvenile "affect children and it's very aggressive"
  - Senile
- SSX:
  - Hoarseness, stridor
- RX:
  - Laser excision, microdebrider
  - Adjunctive therapy: **Cidofovir**, acyclovir, interferon





Malignant neoplasms of the larynx

- 1-5 % of all malignancies
- All are squamous cell carcinomas;

- **Ssx:** Hoarseness, aspiration, dysphagia, stridor, weight lost
- **Risks:** Smoking, alcohol, radiation exposure.

Classification

Supraglottic

- 30-40-% of laryngeal Ca
- 25-75% nodal metastasis

Glottic

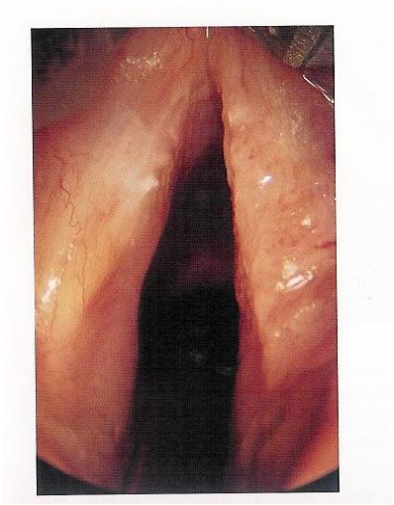
- 50-75%
- Limtted regional metastasis

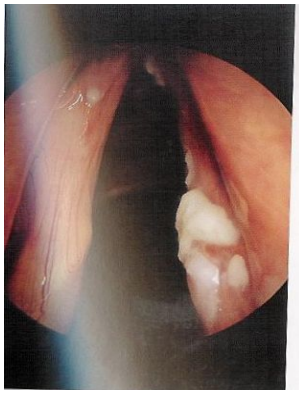
Subglottic

- Rare
- 20% regional metastasis

- RX:

– Radiotherapy
– Hemilaryngectomy. Total laryngectomy + neck dissection





Summary

Congenital abnormality	Pathophysiology	Symptoms	Diagnosis	Management
Laryngomalacia	Most common cause of stridor in neonate and infants	Intermittent inspiratory stridor that improve in prone position.	HX and flexible endoscope	- Observation - Supraglottoplasy - Epiglottoplasty - Tracheostomy
Subglottic stenosis	Incomplete recanalization, small cricoid ring	Biphasic stridor Failure to thrive	Chest and neck X-ray, flexible endoscope	Tracheotomy - **Grade I & II:** Endoscope (CO_2 or excision with dilation) - **Grade III & IV:** Open procedures: -LTR or CTR - Ant cricoid split
Laryngeal web	Incomplete decanalization	- Weak cry at birth - Variable degrees of respiratory obstruction - On and off stridor	Flexible endoscope	- No treatment - Laser excision - Open procedure + tracheostomy
Subglottic haemangioma	- Most common in subglottic space - 50% of subglottic hemangiomas associated with cutaneous involvement	Biphasic stridor	Endoscope	- Observation - Corticosteroid **- Propranolol** - CO_2 LASER

Summary

Vocal Cords: Polyps vs. Nodules (from Toronto notes)

Polyps	nodule
Unilateral, asymmetric	Bilateral
Acute onset May resolve spontaneously	Gradual onset Often follow a chronic course
Subepithelial capillary breakage	Acute: submucosal hemorrhage or edema Chronic: hyalinization within submucous lesion
Soft, smooth, fusiform, pedunculated mass	Acute: small, discrete nodules Chronic: hard, white, thickened fibrosed nodules
Surgical excision if persistent or in presence of risk factors for laryngeal cancer	Surgical excision if refractory

Vocal Cord Paralysis:

Unilateral: affected cord lies in the parmedian position, inadequate glottic closure during phonation > weak, breathy voice.
Usually medializes with time whereby phonation and aspiration improve.
Treatment options include voice therapy, injection laryngoplasty (Radiesse), medialization using silastic block.

Bilateral: cords rest in midline therefore voice remains good but respiratory function is compromised and may present as stridor.
If no respiratory issues, may monitor closely and wait for improvement. If respiratory issues, intubate and will likely require a tracheotomy.

Summary

Benign Laryngeal Papillomas (from Toronto notes):

Etiology
- HPV types 6, 11
- possible hormonal influence, possibly acquired during delivery

Epidemiology
- biphasic distribution: 1) birth to puberty (most common laryngeal tumour) and 2) adulthood

Clinical Features
- hoarseness and airway obstruction
- can seed into tracheobronchial tree
- highly resistant to complete removal
- some juvenile papillomas resolve spontaneously at puberty
- may undergo malignant transformation
- laryngoscopy shows wart-like lesions in supraglottic larynx and trachea

Treatment
- microdebridement or CO_2 laser
- adjuvants under investigation: interferon, cidofovir, acyclovir
- HPV vaccine may prevent/decrease the incidence but more research is needed

Laryngeal Carcinoma (from Toronto notes):

- **Etiology**

SCC most common 3 sites:
1. Supraglottic (30 to 35%)
2. glottic (60 to 65%)
3. subglottic (1%)

- **Mean age:** 45 to 75 M:F = 10:1

- **Risk factors:**

Smoking/EtOH
HPV 16 infection strongly associated with the risk of laryngeal squamous cell cancers

- **Clinical Features**

Dysphagia, odynophagia, globus
Otalgia, hoarseness,
Dyspnea/stridor
Cough/hemoptysis
Cervical nodes (rare w/ glottic CA)

- **Diagnosis:** Laryngoscopy CT/MRI

- **Treatment**: 1ry radiation - 2ry surgery - 1ry surgery for bulky T4 disease

MCQ's:

Q1: Commonest causative organism leading to Acute Epiglottitis

a) Staphylococcus aureus
b) Streptococcus
c) H Influezae B
d) Corynebacterium diphtheria

Q2: Steeple sign is seen in

a) Acute laryngotracheobronchitis
b) Acute epiglottitis
c) Retropharyngeal foreign body
d) Quinsy

Q3: Diptheria causes

a) Diptheria causes
b) Myocarditis
c) Peripheral neuritis
d) All of the above

For mistakes or feedback

ENTteam432@gmail.com

Answers
Q1: C
Q2: A
Q3: D