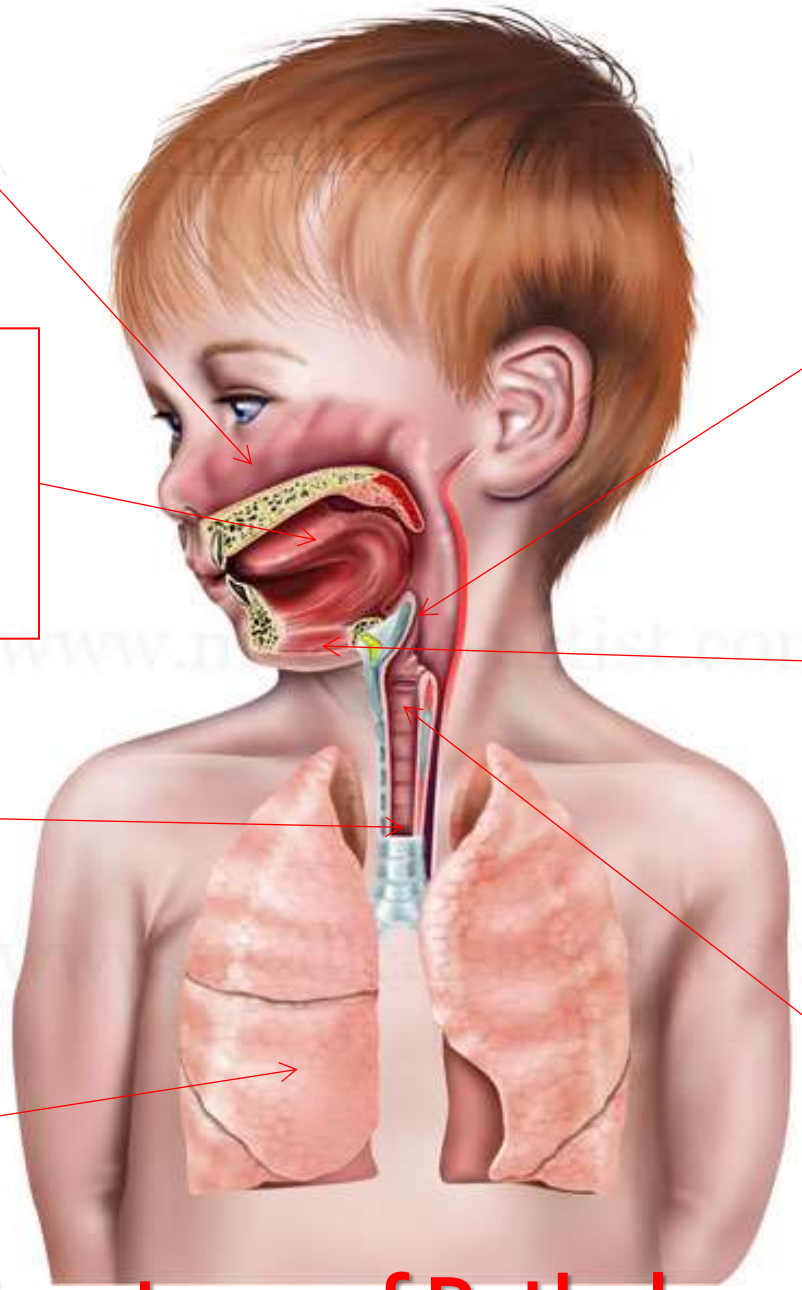
Dundee Focused FRCS ENT Viva Course

Paediatric Airway

www.frcsentvivacourse.co.uk



Choanal atresia
Nasal masses
Craniofacial

Micrognathia
Glossomegaly
IM
Retropharyngeal abscess
Caustics

Vascular compression
FB
Bacterial tracheitis
TOF

Bronchiolitis
Pneumonia
Asthma
Pneumothorax

Epiglottitis
Cysts
Laryngomalacia

Croup
Papilloma
VC palsy
FB
Web
Laryngeal cleft

Subglottic cysts
Subglottic stenosis
Haemangioma

Spectrum of Pathology

History

- Stridor / Stertor
- Voice / Cry
- Cough / Cyanotic attacks
- Feeding difficulties
- Failure to thrive
- Neonatal Intubation

Examination

- Stridor / Stertor
- Voice / Cry
- Cough
- WOB – tracheal tug, sternal recession, intercostal/subcostal recession
- Pectus excavatum, Harrison’s sulci
- Pallor, cyanosis

Neonatal nasal obstruction

- Obligate nasal breathers
- Rhinitis - main cause of neonatal nasal obstruction
- Choanal atresia, pyriform aperture stenosis, and congenital nasal masses must be ruled out when evaluating neonatal nasal airway obstruction
- Birth trauma - septal deformities / septal hematoma

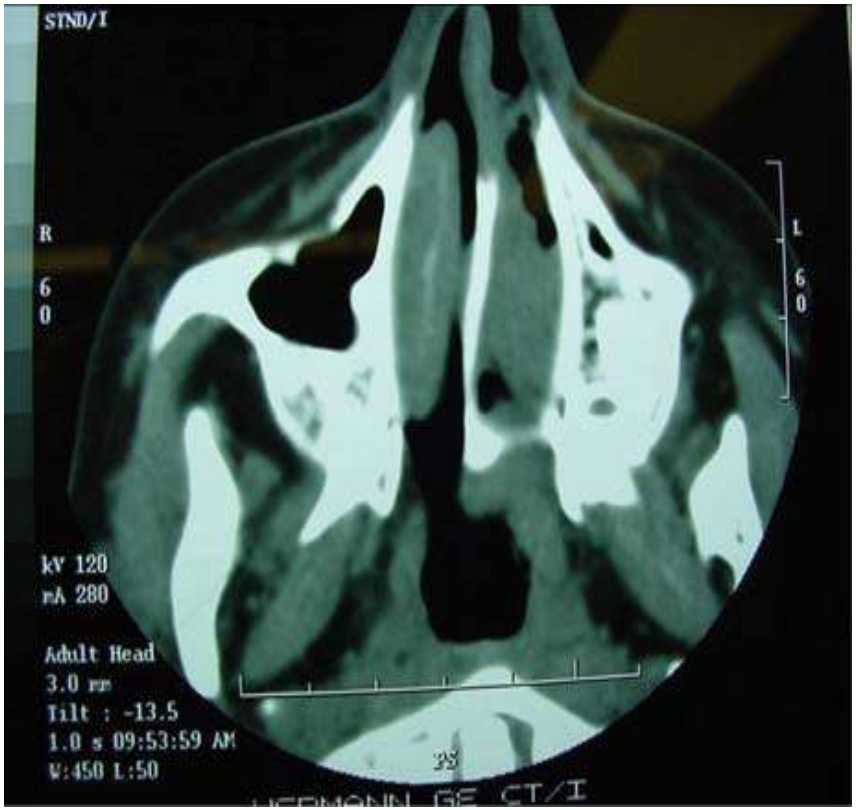
Choanal Atresia

Failure of the breakdown of buccopharyngeal membrane
Bony/Membranous/***Mixed***

Make the diagnosis

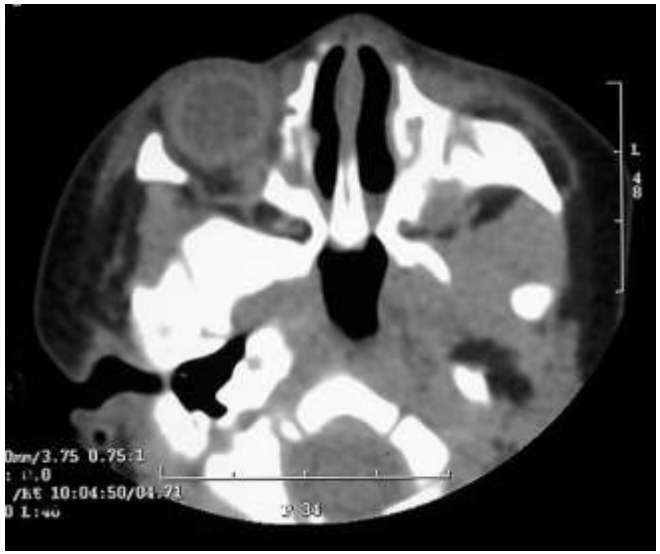
- Misting
- Pass feeding tube
- Nasal endoscopy
- Imaging
  * Decongest and suction nose pre feed & wrap CT

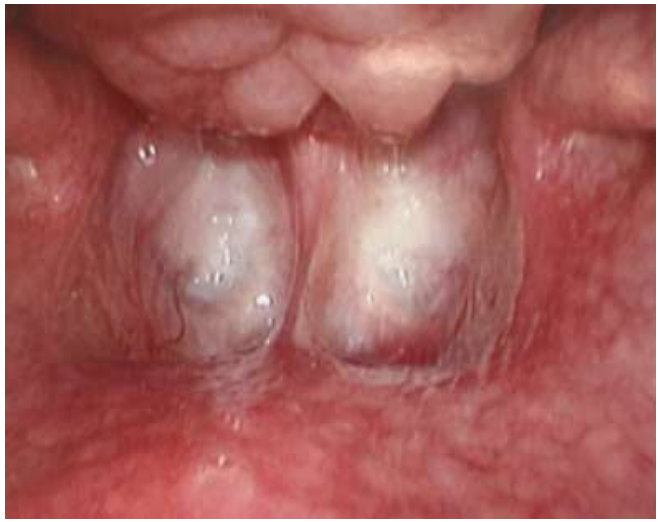
Choanal Atresia - Unilateral



- Unilateral obstruction and rhinorrhoea
- Constant, longstanding

Choanal Atresia - Bilateral



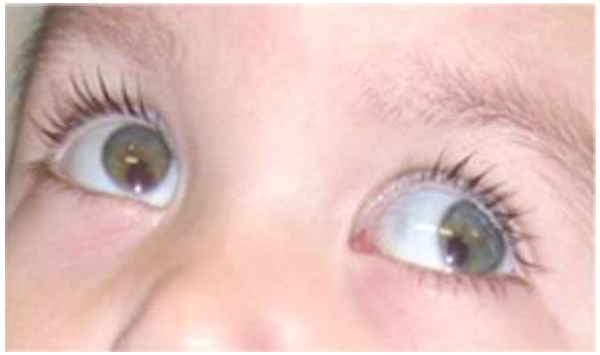


- Neonatal airway emergency
- Cyclical cyanosis

Emergency management:

- Oropharyngeal airway
- Taped in place
- ET intubation – safe transfer
- Orogastric feeding
- Enlist a paediatrician
- Surgical repair

CHARGE association



- **C**oloboma
- **H**eart abnormalities
- **A**tresia of nasal choanae
- **R**etarded growth & developmental delay
- **G**enital abnormalities
- **E**ar abnormalities

Laryngomalacia

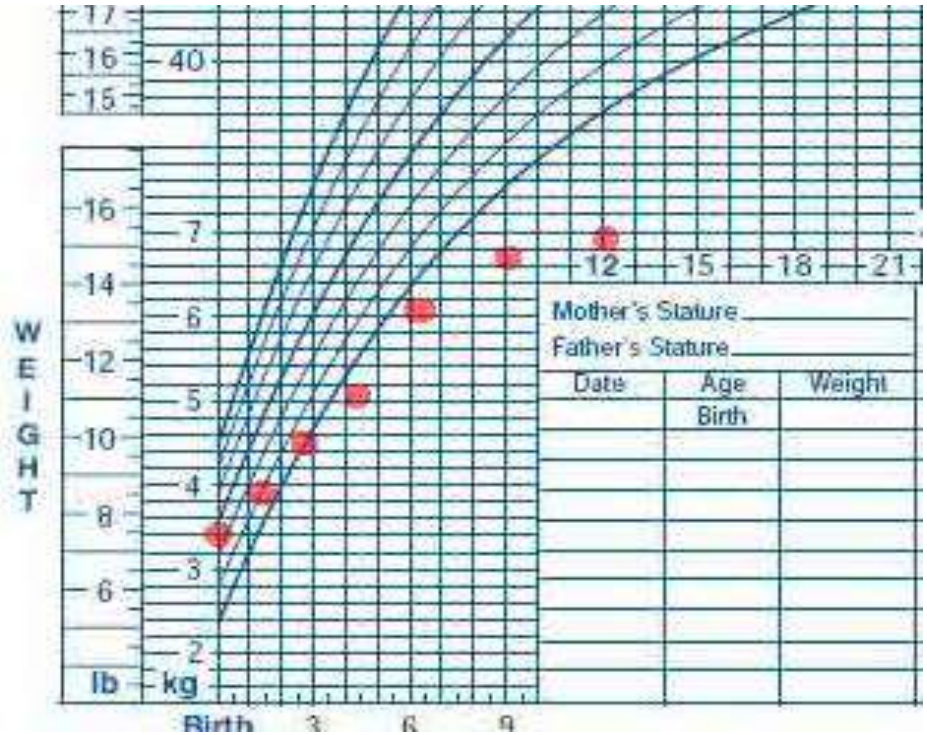
"Floppy larynx"

Commonest cause of neonatal tridor

Must know typical history

Know there are really 2 kinds
1. Anatomical variant

2. Neurological variant
   (reduced tone eg syndromic / neurologically impaired)



Then assess severity

? feeding problems + falling off growth chart

? Cyanotic episodes

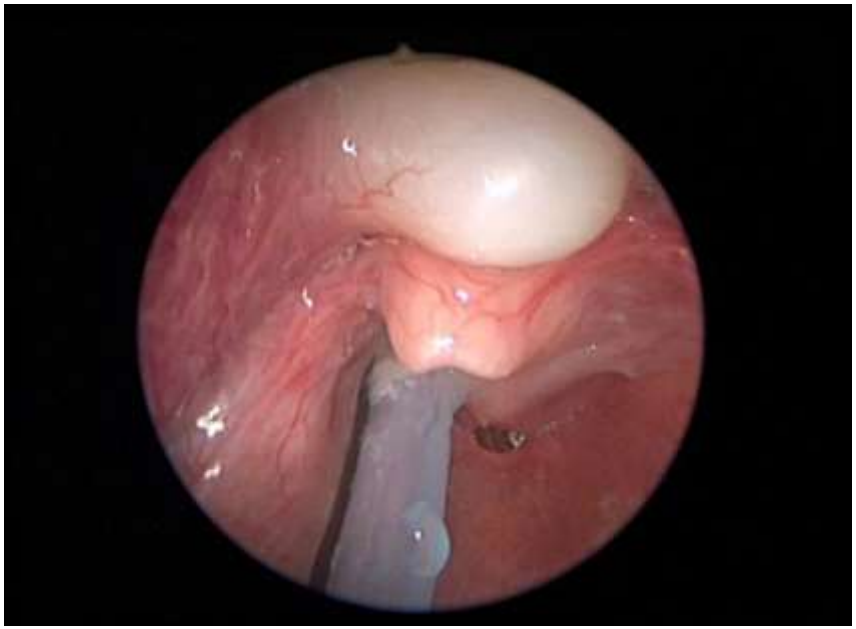
? Apnoeas

Observe WOB

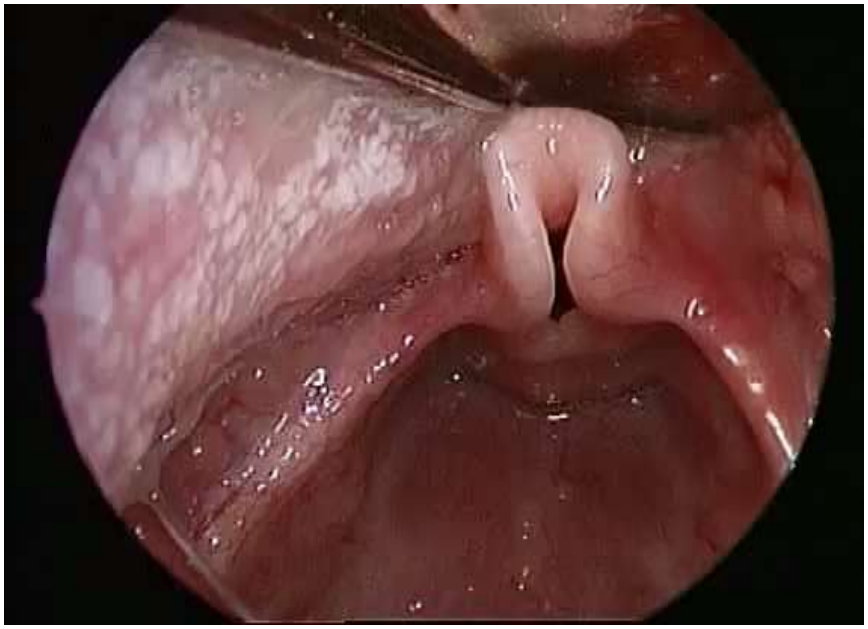
Do awake fibreoptic laryngoscopy

Rules out other pathology

eg vallecular cyst / VCP



compared to just
anatomical variant laryngomalacia



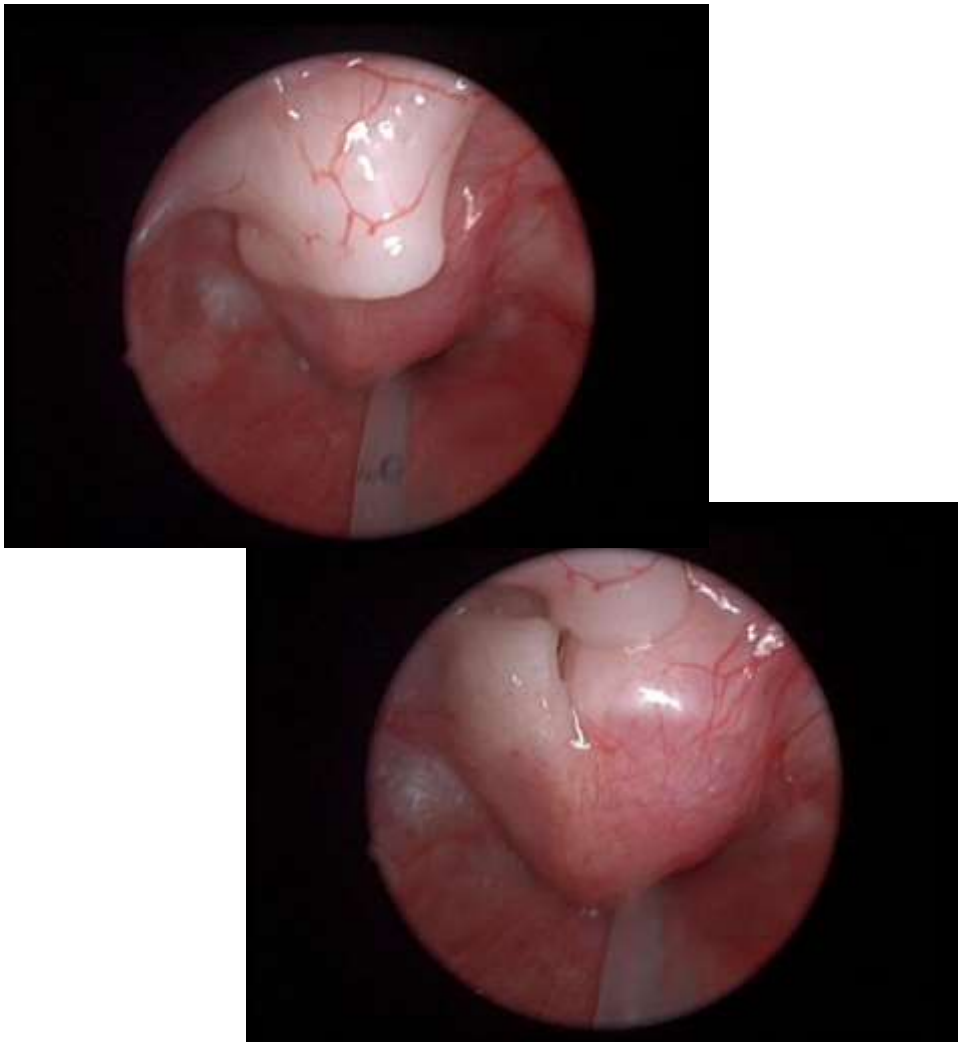
Management

- If V Mild:
  Infant gaviscon +/- ranitidine / observe
  (usually improve by 18months)

- If More Severe / not entirely typical:
  -> MLB

- Aryepiglottoplasty / supraglottoplasty

Neurological variant



- SALT assessment
- ***Don't trim as will aspirate***
  (unless at point need trachy when might consider it)

Vocal Cord Palsy

- 2nd most common cause of neonatal stridor
- 10% of congenital laryngeal anomalies
- Unilateral / Bilateral 1:1
- 50% associated with other anomalies

Vocal Cord Paralysis

Symptoms

Bilateral

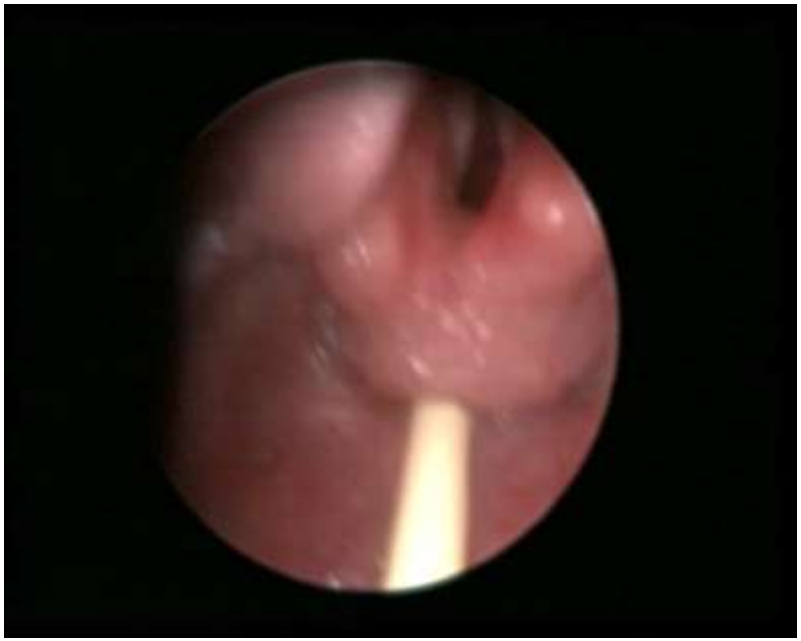
- High-pitched inspiratory stridor
- Cyanosis
- Apnoeas
- Paradoxical function (pressure changes)
  (close during inspiration and open during expiration)

Vocal Cord Paralysis

Symptoms

Unilateral (less symptoms)

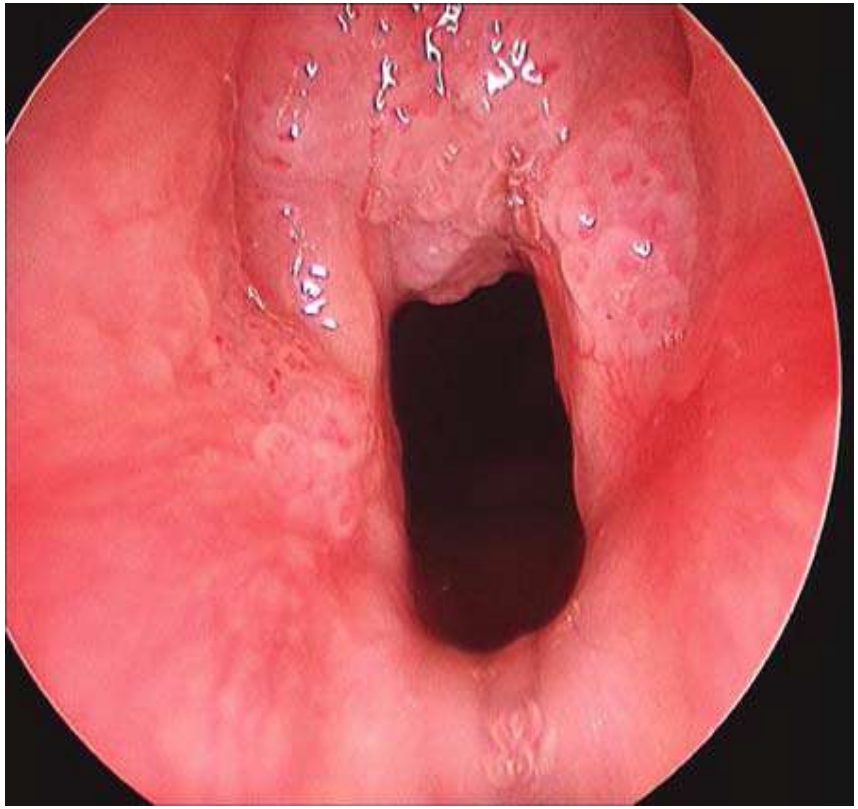
- Weak cry
- Feeding difficulties secondary to laryngeal penetration and aspiration of thin liquids
- Breathy hoarse voice



Vocal Cord Paralysis Diagnosis

- Awake flexible fibreoptic laryngoscopy
  - record for slow motion replay
- MLB
  - Palpation of the glottis to exclude cricoarytenoid joint fixation
- Imaging of head (MRI) and chest to evaluate for associated abnormalities (Neurological & Cardiovascular)
- Laryngeal ultrasound improving

JORRP



- Incidence 4 per 100,000
- M=F
- Hoarse voice, weak cry, stridor, chronic cough, paroxysmal choking
- HPV 6 & 11
- > 200% increased risk in births to mothers with a h/o genital warts
- CS not protective

JORRP – Surgical options

- Cold steel
- CO2 laser
- KTP/Nd:Yag laser
- Pulsed-dye laser
- Microdebrider
- Coblator

Goals

Eradicate disease

Preserve adequate airway

Improve voice

Limit damage to underlying laryngeal mucosa

Adjuvant therapy

Consider when:

- 4 surgical procedures per year
- distal pulmonary disease
- rapid re-growth with airway compromise

Therapy	Evidence	Administration	Mechanism
Alpha-interferon	Ib	s/c injection Intralesional injection	Immunomodulation /inhibitor of viral protein synthesis
Cidofovir	III	Intralesional injection IV	Activity against DNA viruses
Ribavirin	V	Oral/neb	Broad spectrum antiviral
Retinoic acid	V	Oral	Modulates epithelial differentiation
Indole-3 carbinol	V	Oral	Induces anti-proliferative 2 methoxyoestrone
Cimetidine	V	Oral	Immunomodulation
Mitomycin-C	V	Local application	Anti-mitogenic

Natural history

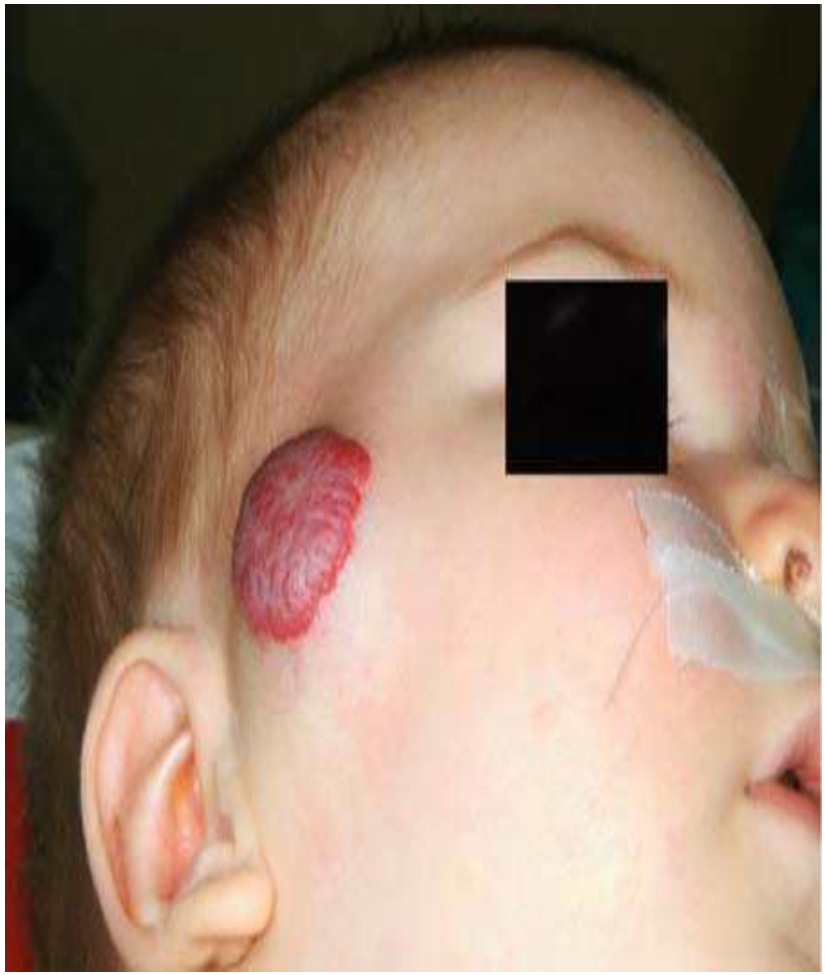
- Spontaneous regression
- Usually around puberty
- Average debulking procedures n= 7-13
- Extra-laryngeal spread in ~ 30%
- Tracheostomy needed in ~ 30%
  (? Activates distal disease)
- Malignant transformation rare but fatal

Bad prognostic markers

- HPV 11 infection
- Age at onset < 3 yrs
- CS birth

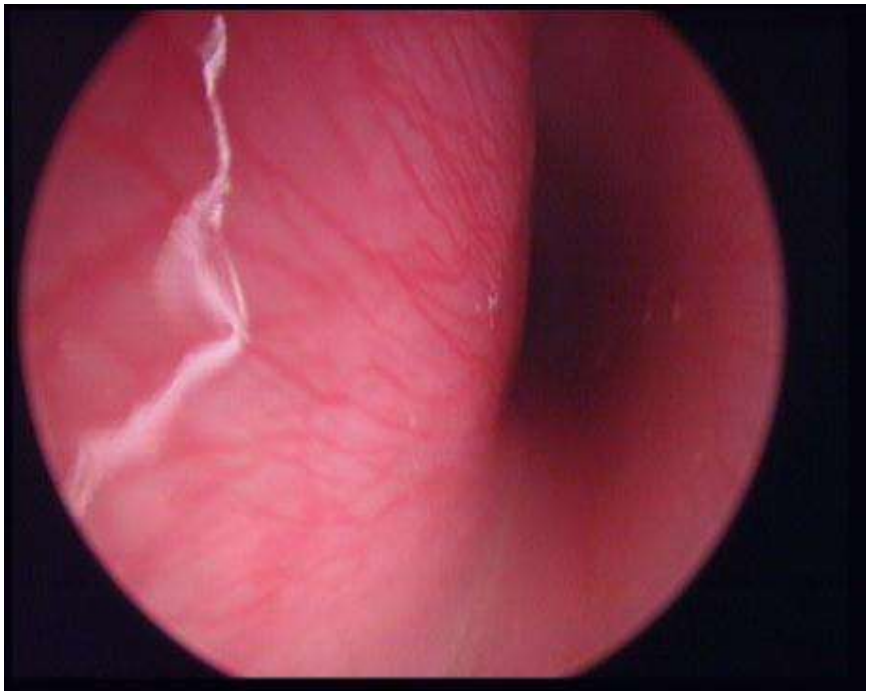
Subglottic Haemangioma

Top Tips



50% of patients with SGH have associated head and neck cutaneous haemangioma

- Presentation peaks at 6 weeks
- progressive stridor, “recurrent croup”
- feeding difficulties, FTT
- Left lateral subglottis
- Can be biopsied safely as capillary not cavernous haemangioma
- Involute sufficiently so that most are asymptomatic by 2-3 years



Management

Propranolol

Propranolol for severe hemangiomas of infancy
Leaue-Labreze C et al
New Eng Journal Med 2008 358:2649-2651

How does it work?

- Accidental discovery
- Non selective beta-blocker
- Effective during proliferative phase
- ? Precise mechanism of action
  - Vasoconstriction
  - Inhibition of angiogenesis
  - Induction of apoptosis

Treatment protocol

- ECG
- ECHO
- Daycase admission
- BM Monitoring
- Start 1mg/kg/day 1st week
- Continue 2mg/kg/day
- Duration based on clinical response
- Regular follow-up

Know the Side Effects

- Bradycardia
- Hypotension
- Bronchspasm
- Peripheral vasoconstriction
- Weakness and fatigue
- Sleep disturbance
- Hypoglycaemia
- Gastrointestinal disturbances e.g. constipation/diarrhoea

Subglottic Stenosis

Top Tips

- Congenital / acquired

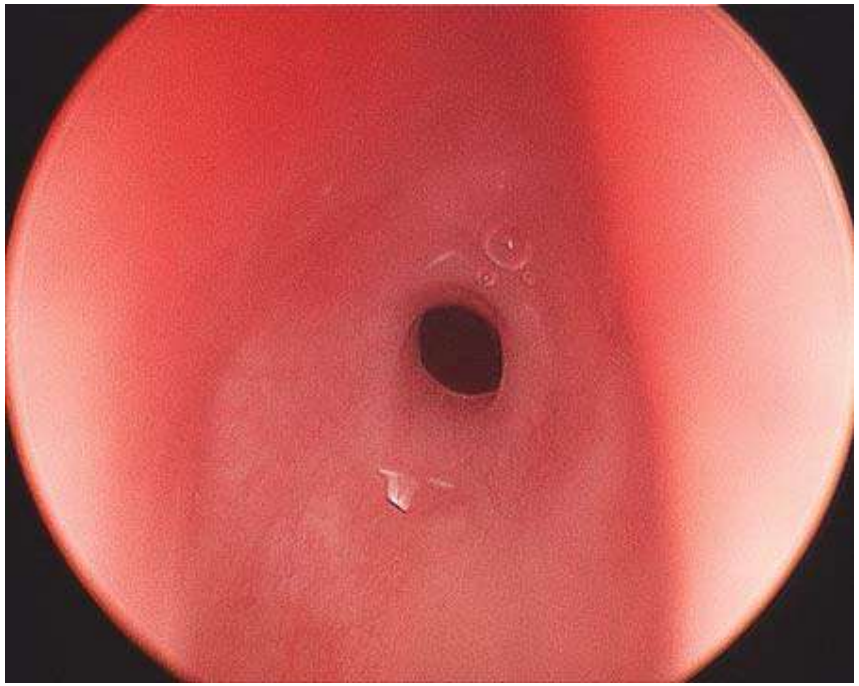
Prevention

Short duration of intubation

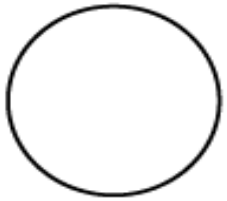
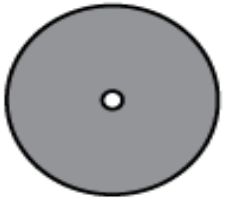
Small tubes

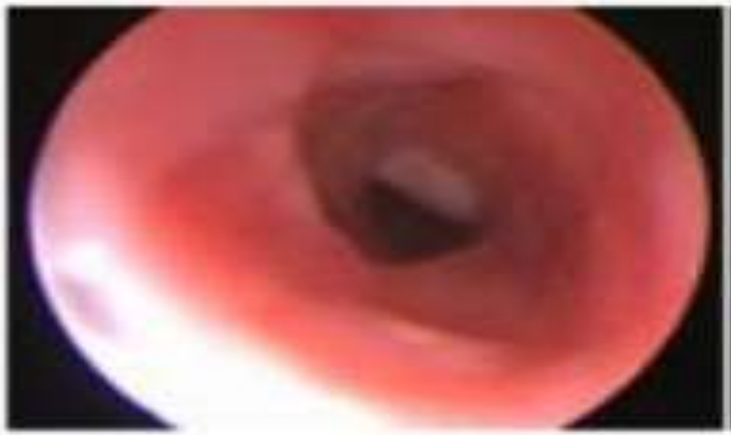
Nasal tubes

Uncuffed tubes

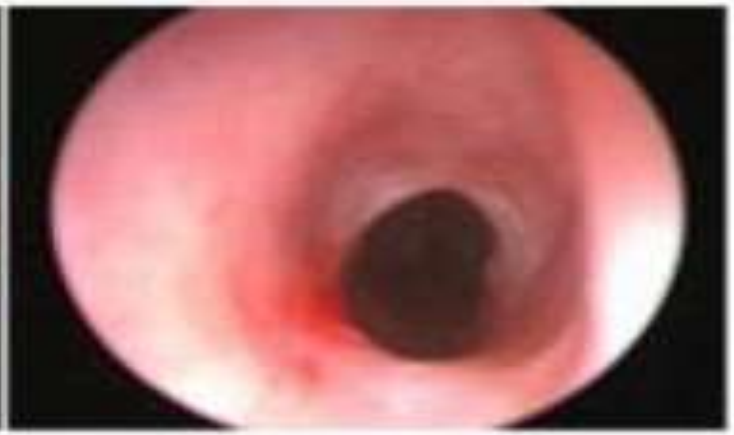


Myer-Cotton Grading

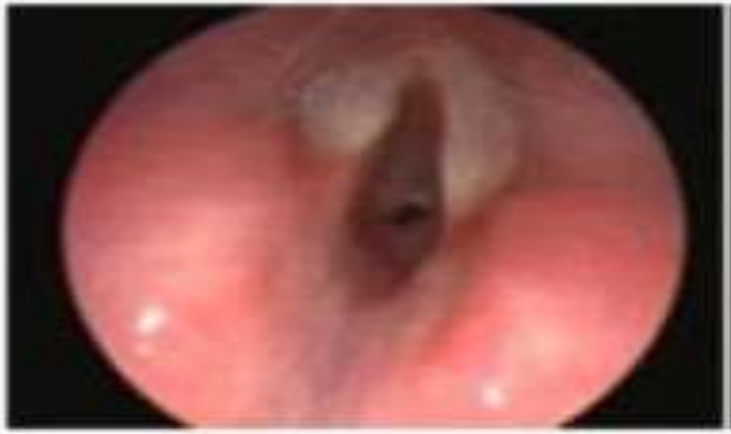
Classification	From	To
Grade I	 No Obstruction	 50% Obstruction
Grade II	 51% Obstruction	 70% Obstruction
Grade III	 71% Obstruction	 99% Obstruction
Grade IV	No Detectable Lumen	



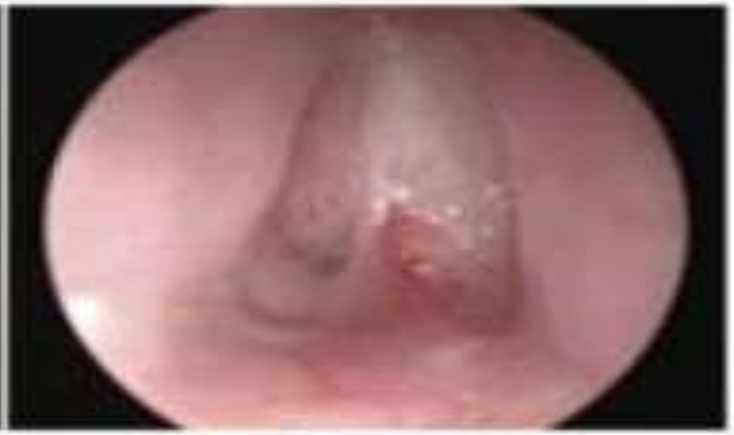
Grade 1
Stenosis 0-50%



Grade 2
Stenosis 51-70%



Grade 3
Stenosis 71-99%



Grade 4
Stenosis 100%

Management strategies

- Endoscopic balloon dilatation
- Endoscopic cricoid split
- Endoscopic posterior graft
- Mitomycin C
- Open cricoid split
- Temporary trachy
- LTR with costal cartilage graft (ant/post graft)
- Cricotracheal resection (CTR) (Severe Gd 3 & 4)

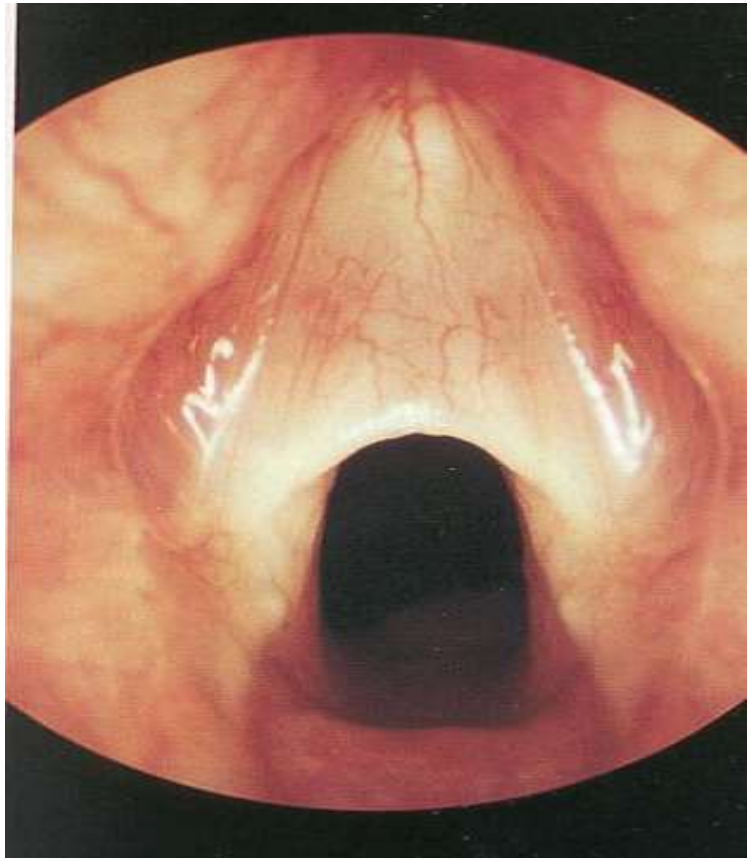
Congenital Laryngeal Webs

- Uncommon
- Failure of laryngeal recanalisation
- Most are glottic (75%)
- Symptoms
  - Hoarseness
  - Aphonia if severe
  - Airway obstruction
- Complete laryngeal atresia is incompatible with life and needs emergency tracheostomy

Laryngeal Web Diagnosis

- Flexible laryngoscopy
- MLB

  - to exclude co-existing subglottic stenosis



Treatment

- Thin anterior glottic web
  Incision or dilation
- More significant glottic lesion
  Incision and dilation with possible revision
- Subglottic involvement is usually accompanied by anterior cricoid plate abnormality
  External approach with division of the web and the cricoid plate (LTR)
- >75% glottic involvement and significant subglottic extension
  Tracheostomy soon after birth