GENERAL ENT “EMERGENCIES”

- ENT for A&E

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THE ROYAL ADELAIDE HOSPITAL  
ADELAIDE  
SOUTH AUSTRALIA
Overview

• INFECTIONS- Present with Acute Pain, Fever, Discharge & Dysfunction

• NEOPLASMS- Beware Unilateral Symptoms and Signs, Chronic Pain

• Otologic Disorders
  – Hearing Loss
  – Pain
  – Disorder of balance

• Nasal Disorders
  – Nasal Obstruction
  – Facial Pain / Disorder of sense of smell
  – Bleeding

• Facial, Oral and Pharyngeal Disorders
  – Facial muscular dysfunction
  – Dysphonia / Dysphagia
  – Airway
Otologic Disorders
Anatomy

- Pinna
- Ear canal
- Tympanic membrane
- Middle ear and mastoid
- Inner Ear
Traumatic Disorders of the Pinna

• **Hematoma**
  - Risk of cartilaginous necrosis
  - Drain
  - Antibiotics
  - bulky ear dressing
  - close follow up

• **Lacerations**
  - single layer closure
  - pick up perichondrium
  - bulky ear dressing
Aspiration of Pinna Hematoma
L.A. for Traumatic Disorders of the Pinna

- Can use posterior auricular or "ring" block (modified Plester injection technique) for local anesthesia
- 2% Lignocaine 1/ 80 000 Adrenaline
Pinna

• *Chondritis - Cellulitis* ?
  
  - Infectious
  - difficult to treat
  - poor blood supply
  - cover S. Aureus and Pseudomonas
  - extra care in diabetics

- **Inflammatory causes**
  - Seronegative arthritis at times indistinguishable from infection
  - usually the ear lobe is spared
Wax in External Ear Canal

- Wax is normal (keratin, fatty acids, cholesterol)
- Ceruminous gland is modified sweat gland
- Sebaceous glands
- Outer 2/3 of ear canal
- Wax moves due to epithelial migration and jaw movement
- pH keeps fungus and other infections out
- Only treat wax if obstructing ear canal
- Soften wax
  - Oily ear drops
- Break up wax
  - 4% Bicarbonate soda
  - Dilute peroxide and glycerine based solutions
- Tissue spears

- DO NOT INSTRUMENT DEEPER THAN 3cm.
- SYRINGE CAREFULLY – VOLUME NOT PRESSURE TECHNIQUE
Otitis Externa

• Presentation
  – Pain / Tenderness
  – Scant discharge

• Types
  – Viral (vesicles)
  – Bacterial
  – Fungal

• Treatment
  – Ear Toilet
  – Powder
  – Topical Antibiotic Drops
  – Analgaesia
  – Water precautions
  – ? Systemic Antibiotics

• Malignant O.E.
  – Skullbase osteomyelitis
  – Immunosuppressed / Diabetics
  – Fulminant / lethal
  – Pseudomonas
  – Intravenous & Long term antibiotics
Foreign Bodies in Ear Canal

- Usually put in by patient
- Some bugs fly / crawl in
- Kill bugs with mineral oil, or lignocaine
- remove with micro-forceps, suction or tissue adhesive
- “Lever” / “Slide & Retrieve” technique with right angle probe
- Preferably use microscope
- Beware disc / cell batteries
Tympanic Membrane Perforation

- Hard to see TM
- Requires ear clean with tissue spears
- History of discharge helps
  - OME
    - usually mucoid
    - Usually profuse
  - OE
    - Usually scant
- Usually from raised middle ear pressure secondary to pus or fluid
- Sometimes from external trauma
- or barotrauma (descent from flight / dive)

  - most heal uneventfully
  - but all need otology follow-up

  - treat with antibiotics
  - drops indicated for purulent discharge
  - (avoid gentamycin drops)

  - Perforation with vertigo and facial nerve involvement need immediate referral
Otitis Media

• **Acute Otitis Media**
  – Sequelae
    • May get better
    • May get worse (Chronic Otitis Media)
  – Complications
    • Mastoiditis

• **Chronic Otitis Media**
  (Otitis Media with Effusion)
  (Chronic Suppurative Otitis Media)
  – Sequelae
    • May get better
    • May get worse (Chronic change to ear drum +/- ME contents)
  – Complications
    • Cholesteatoma
Acute Otitis Media

- Clinical features
  - Pain / Fever
- Microbiology
  - Viral
  - Bacterial
    - Strep. Pneumoniae
    - H. Influenzæ
    - M. Catarrhalis
- Treatment
  - General
  - (Analgesia / Antipyretics)
  - Antibiotics
  - (Amoxicillin +/- Clavulanic acid, Cefaclor, Trimethoprim)
- Sequelae
  - Perforation
  - Chronic Otitis Media
- Complications
  - Mastoiditis
Mastoiditis

- Uncommon
- Always has TM signs
- Treatment
  - Intravenous antibiotics
  - Timentin / Chloramphenicol
  - Incision & Drainage
  - Wide Myringotomy
  - Cortical Mastoidectomy
- Complications
  - Intracranial
    - Sigmoid Sinus Thrombosis / thrombophlebitis
    - Meningitiis / Cerebritis
    - Extradural / Sudural / Cerebral abscess
  - Death
Chronic Otitis Media

- OTITIS MEDIA WITH EFFUSION
- TYMPANOSCLEROSIS
- CHRONIC TYMPANIC MEMBRANE PERFORATION
- Chronic Suppurative Otitis Media
- Inactive vs Active
- Mucous D/C vs Scant, Malodorous D/C
- Central vs Marginal perforation
- Tubo-tympanic vs Attico-antral
- Safe perforations vs Cholesteatoma

- Worrying symptoms and signs
  - Pain
  - Facial palsy
  - Vertigo
  - Sensorineural hearing loss
Chronic Suppurative Otitis Media

Treatment

– Medical
  • Water precautions
  • Tissue spears
  • Topical antibiotic drops / (Betadine)
  • Antibiotics ? ( microbiology)
  • Hearing aids
  • Schooling assistance

– Surgical
  • Depends on disease
  • Myringoplasty ( Tympanoplasty)
  • Mastoidectomy and others
DRY CENTRAL PERFORATION

SUBTOTAL PERFORATION

DISCHARGING PERFORATED TM

POSTERIOR MARGINAL PERFORATION WITH CHOLESTEATOMA
Cholesteatoma

Complication of Chronic Otitis Media

Chronic insidious infection

Erosion of bone into cranial vault with spread of infection

Usually requires surgery
Sudden Sensori-Neural Hearing Loss

- Medical Emergency of the Ear
- Sudden Unilateral SNHL (Tuning Forks)
- +/- Vertigo
- +/- Tinnitus
- Admit
  - RIB, Steroids, Carbogen, Vasodilators
- Investigate
  - Audiometry, CBE, ESR, Lipids, TFT, VDRL
  - MRI to exclude Acoustic Neuroma and CNS anomalies eg MS
Vertigo

- V - Vascular (carotid & v-b)
- E - "Epilepsy" (CNS e.g. TIA, CVA, Migraine, MS)
- R - Drug Therapy
  - Aminoglycosides, Anti-malarials (Quinine)
  - Beware of topical drops & perforated ear drums
  - Chemotherapy
  - Diuretic
- T - Trauma (CHI, Skull #, PLF, Baric, ?Acoustic)
- I - Infection (STORCH)
- G - General
  - Arthritis of the Neck
  - BP – high or low ,
  - Cardiac – WPW, Stoke-Adams,
  - Diabetes
- O - Otologic
  - A - Acoustic neuroma
  - B – BPPV (cupulo-lithiasis)
  - C – Cholesteatoma
  - D – Dehiscence of Semi Canals (Superior)
  - E – Endolymphatic Hydrops (Menieres Disease)
  - V – Vestibular Neuronitis
Inner Ear –
Common causes of Dysequilibrium,
Acute Peripheral vertigo, vestibulopathy

- **BPPV (Benign Paroxysmal Positioning Vertigo)**
  - Treatment = Epley’s Particle Repositioning Manoeuver

- **“Labyrinthitis” / “Vestibular Neuronitis”**
  - acute onset
  - no central signs
  - usually young
  - horizontal nystagmus
  - Treatment = Vestibular Sedatives eg SERC, Stemetil, Valium, fluids, rest,

- **Meniere’s Disease** - vertigo, sensorineural hearing loss, tinnitus, aural fullness
  - Treatment = Vestibular Sedatives eg SERC, Stemetil, Valium, fluids, rest, severe cases may need surgery
Temporal Bone Fractures

- **Types**
  - Transverse v longitudinal v oblique
  - Otic capsule v Non otic capsule
- **Features**
  - Hearing loss (conductive or SNHL)
    - Haemotympanum
    - Blood / CSF Otorrhea
  - Vertigo and nystagmus
  - CSF rhinorrhea (beta 2 Transferrin)
  - VII palsy
  - TM tear
- **Treatment**
  - Conservative mainly
Referred Otalgia

- Cervical Spondylitis
- Teeth
- Tonsil
- Retro Molar Trigone
- Vallecula
- Pyriform Fossa
- Post Cricoid Hypopharynx
- Larynx
Referred Otalgia
- Acute on Chronic Ear Pain

- TEMPORO MANDIBULAR JOINT DYSFUNCTION
- COSTEN’S SYNDROME
- Pain
- Tinnitus
- Altered hearing
- Altered balance
- Malocclusion
- Tender muscles of mastication
Nasal Fractures

- Ice
- Analgesia
- Nasal decongestants
- Exclude other mid facial and craniofacial fractures
- Exclude head and neck and spinal injury
- Exclude septal haematoma
- Can be reduced immediately with local anesthesia (injection + nasal packs with lignocaine / adrenaline)
- Usually reduced 7-10 days later
EPISTAXES
Epistaxis - BLOOD SUPPLY

EXTERNAL AND INTERNAL CAROTID ARTERY SYSTEMS

External Carotid
- Internal maxillary
- Sphenopalatine artery
- Posterior nasal arteries
  - Anastomosis with pharyngeal artery
  - at Woodruff’s Nasopharyngeal Plexus

Internal carotid
- Ophthalmic
- Anterior ethmoid
- Posterior ethmoid (Medial and lateral branches)
- Arteriovenous anastomoses with
  - Greater palatine
  - Facial
  - Superior labial
- at Little’s area (Kieselbach’s plexus)

LITTLE’S AREA of Anterior Nasal Septum
(Kieselbach’s Plexus)

WOODRUFF’S PLEXUS of Posterior Lateral Nasal Wall
Epistaxis - EPIDEMIOLOGY

• More common in young and elderly
• **The Elderly**
  – A&E attendances more in elderly
  – episodes arterial
  – last longer due to vessel changes
  – More common in colder months, low humidity
• **The Young**
  – Local trauma
  – More common in warmer months, low humidity
Epistaxis - AETIOLOGY

Local
- Trauma – Digital / Fractures
- Desiccation
- Rhinosinusitis
- Septal perforation
- Irritants - Medications – steroid, decongestants / Smoking
- Anatomic deformities (Creating turbulent flow and desiccation)
- Foreign bodies
- Tumours – NPC (Chinese) / Angiofibroma –(Juvenile males with unilateral symptoms)
- Iatrogenic

Systemic
- Age - Fibrosis of tunica media in arterial vessels
- Osler Weber Rendu
- Bleeding diatheses – VW disease, Haemophilia A/B
- Haematological malignancies
- Malnutrition
- Alcohol
- Hypertension – (can cause prolonged and repeat bleeding but not a specific cause)
- Drugs - anticoagulants
Epistaxis - \textit{Anterior}

- 90\% of all epistaxis
- Little’s Area (Kisselbach’s plexus)
- usually children, young adults

\textit{Etiologies}
- Trauma (epistaxis digitorum)
- Summer (Dessication of mucosa)
- Allergies
- Irritants - cocaine, sprays
- Pregnancy / pre-pubertal / elderly
Epistaxis - *Posterior*

- 10% of all epistaxis
- usually in the elderly

**Etiologies**
- Winter months and summer from mucosal dryness
- Coagulopathy
- Atherosclerosis
- Neoplasm
- Hypertension (debatable)
Epistaxis - ASSESSMENT

• History
  • Amount
  • Frequency
  • Precipitants
  • Position of bleed – anterior or posterior
  • Other nasal symptoms
  • Bleeding history – bruising, prolonged bleeding from cuts, surgery, teeth

• Past medical / surgical history
  • Hypertension
  • Bleeding Diatheses
  • Nasal surgery
  • Head injury

• Medications
  • Anticoagulants

• Family History
  • Bleeding diatheses
  • Osler-Weber-Rendu

• Social Circumstances
Epistaxis - MEDICAL MANAGEMENT

• Degree, site, aetiology and clinical state of patient dictates expediency and aggressiveness of initial management

• Short frequent bleeds
  – Often due to crusting of Little’s area, digital trauma
  – Common in children
  – Vaseline
  – Bactroban (mupirocin)

• Major Bleed
  – First Aid measures
  – Aggressive intervention
MAJOR BLEED - Management

PRIMARY SURVEY
• Airway
• Breathing
• Circulation
• Assess degree of hypovolaemia and treat as necessary (Crystalloid, colloid, blood)

PREPARE YOURSELF AND ENLIST HELP
• Protective glasses
• Headlight
• Plastic apron
• Epistaxis Tray
• Suction
• Second person to assist, commence resuscitation if necessary and take bloods etc.

PREPARE PATIENT
• Position patient
• Local Anaesthesia and analgesia
MAJOR BLEED - Management

**MAIN AIM**
- to locate offending vessel and cauterise,
- pack if bleeding profuse despite attempts or unable to locate vessel and still bleeding
- An idea of probable location of bleeding important as treatment different
- (Anterior vs Posterior, Above vs Below Middle Turbinate)

**LOOK**
- Nose – Killian’s or Thudicum’s
- Oropharynx- Tongue depressor

**CLEAR NOSE**
- Patient blows nose to evacuate clot and to restart bleeding,
- residual clot removed with Frazier sucker
- oropharyngeal clots removed with Yankauer

**DECONGEST AND ANAESTHETISE NOSE**
- Allows better view into nose
- Vast majority of bleeds occur in Little’s area (anterior septum) and can be very anterior
- Posterior bleeds from posterior septum, posterior lateral nasal wall at Woodruff’s plexus
- Bleeding from above Middle Turbinate suspicious of Anterior Ethmoid Artery Bleed
- Cophenylcaïne Forte spray on cotton wool pack
- Cocaine 10 % solution on pledget
- Oxymetazoline 0.05%
- Ephedrine drops 0.5%
- Place pledget directly over bleeder if it can be seen
- If still bleeding infiltrate by injection in submucoperichondrial plane into caudal border of septum or around bleeder with lignocaine 1% and adrenaline 1: 80k with 27G needle
Epistaxis – Anterior packing

- **Anterior Sites**
  - Pressure +/- cautery and/or tamponade
  - all packs require antibiotic prophylaxis
Epistaxis - Posterior Packing

- Pass a 12f Foley Urinary catheter into post nasal space and inflate balloon with 7ml H2O to occlude posterior choana
- Pack against the occluded choana with anterior pack
- “sleeve” cut end of drainage tube of Foley catheter against pack with no pressure on the skin of the nasal ala
- Need analgesia and sedation
- require admission and 02 saturation monitoring
Posterior pack with 12 F Foley Catheter with Trimmed “Bag end” to protect Nasal Ala and provide Anterior – Posterior compression in conjunction with anterior pack.
Sliding the trimmed “bag end” up along shaft of Foley catheter
Inserting Foley catheter through posterior choana into post nasal space

Inflating balloon with 7ml of saline
Anterior traction on catheter to bring inflated balloon forward and occlude posterior choana.
Anterior packing against balloon occluding posterior choana
Sliding the trimmed “bag end” against the anterior packing to cause Anterior – Posterior compression and lies within nostril to avoid pressure necrosis of nasal ala.

Applying umbilical cord clamp.
Applied umbilical cord clamp
Epistaxis - Complications

- severe bleeding – life threatening haemorrhage
- hypoxia, hypercarbia
- sinusitis, otitis media
- necrosis of the columella or nasal ala
MAJOR BLEED not settling with packing - Management

- EMBOLISATION

- LIGATION OF SPHENO-PALATINE ARTERY
  - ENDOSCOPIC TRANS NASAL APPROACH

- LIGATION OF INTERNAL MAXILLARY ARTERY
  - TRANS ANTRAL ENDOSCOPE ASSISTED

- LIGATION OF EXTERNAL CAROTID ARTERY
  - SKIN CREASE INCISION 2 FINGER BREADTHS BELOW MANDIBLE
  - RETRACT SUBMANDIBULAR GLAND ANTERIORLY
  - RETRACT STERNO-MASTOID MUSCLE POSTERIORLY
  - COMMON CAROTID ARTERY AND BIFURCATION
  - IDENTIFY EXTERNAL CAROTID ARTERY
  - CONFIRM BY IDENTIFYING AT LEAST THREE BRANCHES
  - LIGATE ABOVE FACIAL ARTERY TAKE OFF
Nasal Foreign Body

Nose

– Usually at junction of septum and inferior turbinate
– Unilateral offensive discharge
– “Levering” Technique of removal
– Beware the disc “Button Batteries”
Infections - Sinusitis

**Signs and symptoms**
- H/A, facial pain in sinus distribution
- purulent yellow-green rhinorrhea
- Fever
- Nasal obstruction
- CT more sensitive than plain films

**Causative Organisms**
- gram positives and H. Influenza (acute)
- anaerobes, gram negatives (chronic)
Infections - Sinusitis

Treatment

acute - amoxil
chronic - amoxil-clavulinic acid, clindamycin, quinolones
Supportive - decongestants, saline sprays, steroid nasal sprays, analgesia, ice and heat packs

Complications

Ethmoid sinusitis – orbital cellulitis and abscess

Frontal sinusitis – may erode bone (Potts Puffy Tumor, Brain Infection and Abscess)
MAKE YOUR FACE YOUR BEST ASSET
7th Nerve Palsy

- Most cases are idiopathic
  - link to HSV
  - no proof steroids or antivirals are effective, but many advocate
  - MUST protect eyes from drying out
- Surgical decompression indicated in the rare patient not improving by 2 weeks and ENOG out > 90%
- Investigate to exclude other pathology such as CP angle or Parotid tumour or perineural spread of cutaneous SCC
Facial Cellulitis

- Most common streptococcus and staphylococcus,
- Rarely H. Influenza
- Can progress rapidly
- Treat with intravenous penicillin / flucloxacillin
- Risk of spread to cavernous sinus
Parotiditis

- Usually viral
  - paramyxovirus
- Bacterial
  - elderly, immunosuppressed
  - associated with dehydration
  - cover - Staphylococci, anaerobes
Pharyngitis

- Irritants
  - reflux, trauma, gases
- Viruses
  - EBV, adenovirus
- Bacterial
  - GABHS
    (mycoplasma, gonorrhea, diptheria)
**Tonsillitis**

- **Presentation**
- **Types**
- **Tests**
  - Monospot
  - FBE if admitting
  - Throat swab not helpful
- **Treatment**
  - Oral Penicillin
  - Admit if can’t drink
Quinsy (Peritonsillar Abscess)

- **Presentation**
  - Unilateral pain and fever
  - Usually 4 days after sore throat
  - Muffled “Hot potato” voice
  - Trismus
  - Palatal swelling
  - Uvula oedema and deviation

- **Aetiology**
  - ? Weber’s Glands
  - ? Complication of Tonsilitis

- **Treatment**
  - IV Penicillin / Flagyl / Steroids
  - Aspiration (diagnostic)
  - Incision + Drainage

- Can be life threatening
Epiglottitis

Clinical Picture

- Older children and adults
- Decrease incidence in children secondary to HIB vaccine
- Onset rapid, patients look toxic
- Prefer to sit, muffled voice, dysphagia, drooling, restlessness
Epiglottitis

- Avoid agitation
- Direct visualization if patient allows
- Plain XRay soft tissue of neck
  - thumb print, valecula sign
- Prepare for emergent airway
- best achieved in a controlled setting (OT)
- Ceftriaxone +/- steroids
Epiglottitis
Retropharyngeal Abcess

• Anterior to prevertebral space and posterior to pharynx
• Usually in children under 4 (lymphoid tissue in space)
• pain, dysphagia, dyspnea, fever
• swelling of retropharyngeal space on lateral x-ray
• Complications - mediastinitis
Masticator - Parapharyngeal Space Infection – Neck Abscess

Neck Space Infections
BEWARE OF POTENTIAL FOR AIRWAY OBSTRUCTION

• Infection of the lower molars
• Invasion of masticator space
• Swelling, pain, fever, TRISMUS

Treatment
• IV antibiotics
• (Penicillin or Clindamycin)
• +/- IV steroids
• ENT admission
• Observe in HDU / ICU
• Surgical drainage if no better
Acute Necrotizing Ulcerative Gingivitis (ANUG)

ANUG

- Bacterial infection
- causing an acute necrotizing, destructive disease of periodontium

Treatment
- oral rinses
- Antibiotics
- (penicillin, clindamycin, tetracycline)
Ludwigs Angina

Ludwigs

- Rapidly progressive cellulitis
- of the floor of the mouth
- Can spread to all neck spaces
- Alpha Hemolytic Streptococci and Bacteroides
- usually in elderly debilitated patients
- precipitated by dental procedures
- massive swelling with impending airway obstruction

Treatment

- ICU, antibiotics, airway management
Angioedema

- Occasionally life threatening
- Hereditary and related to ACE inhibitors
- Antihistamines, steroids and doxepin
Foreign Body Throat

• **Usually**
  – Fish bone
  – Stuck in tonsils or tongue base
  – Chop bone or meat bolus
  – Stuck in vallecula
  – Stuck at cricopharyngeus

• **Treatment**

  • Above oropharynx
    – Topical anaesthetics
    – Laryngoscope and Magill forceps

  • Below oropharynx
    – General anaesthetics and endoscopy
CANCER OF THE UPPER AERO-DIGESTIVE TRACT
AIRWAY EMERGENCY
NECK TRAUMA

- **ORGANS & STRUCTURES**
  - Vascular (most common)
  - Pharyngoesophageal
  - Laryngotracheal
  - Others (cranial nerve, thoracic duct, brachial plexus, spinal cord)

- **VASCULAR INJURY**
  - External hemorrhage
  - Extending soft tissue hematoma, distort or obstruct the airway
  - Disruption of cerebral perfusion (CVA)
    - Zone 1 (below cricoid cartilage)
    - Zone 2 (between cricoid cartilage and mandible angle)
    - Zone 3 (above mandible angle)
• Anatomy & Physiology
• Acute Clinical Issues of UAO
  its assessment & management
• Best Practice
• Cricothyroidotomy
• Tracheostomy
  • indications
  • procedure
  • complications
• Summary
ANATOMY OF LARYNX
PHYSIOLOGY OF LARYNX
Airway & Voice
PHYSIOLOGY OF LARYNX
- Swallowing

- Oral phase
  - oral preparatory phase
  - oral transit phase

- Pharyngeal phase

- Esophageal phase

- AIRWAY PROTECTION
  - Laryngeal elevation by straps
Airway Emergencies

- Frightening
  - Patient & Doctor

- Stridor vs Stertor

- Distressed (+/- Drooling)

- Desaturating – agitated

- Assess level of obstruction
  - Listen to stridor
  - Examine ENT & Neck
    - Swelling of face/tongue/neck
    - Sub-cutaneous emphysema
  - Investigate
  - ONLY if STABLE
  - or ABLE TO STABILISE
  - Fibreoptic Laryngoscopy
  - Plain XRay Neck
  - CT Neck

- Treatment
  - High flow 02 (Heliox)
  - Nasopharyngeal airway
  - Oral airway
  - Nebulised adrenaline
  - Steroids
  - Bag and mask
  - Intubation - ventilating bronchoscope if difficult
  - Cricothyroidotomy
  - Tracheostomy
BEST ENVIRONMENT IS OPERATING THEATRE
Teamwork –
Surgeon – Anaesthetist - Nurse

- **Surgical Nurse**
  - INSTRUMENTS PREPARED
  - Tracheostomy tray (including local anaesthetics)
  - Cricoid Hook and Tracheal dilator (Must follow patient to ward)
  - Laryngoscopy tray with working light leads and appropriate suckers

- **Anaesthetic Nurse**
  - Gases
  - Venturi
  - Difficult Airway kit (Laryngoscope blades, Introducers. Fibreoptics etc)
  - SUCTION !!!!

- **Anaesthetist and Surgeon**
- **must work out a plan (PPPPPPPPP !)**
  - 3 Choices
  - Tracheostomy under LA
  - Fibreoptic Intubation
  - “Gas Down” with reversible inhalational agent (Sevoflurane)

- **MINIMAL SEDATION, * RISK RAPID DESATURATION AND ARREST***
CRICOTHYROIDOTOMY

• IN ABSOLUTE EMERGENCY

• POSITION PATIENT WITH NECK EXTENDED

• MARK OUT MIDLINE
  – SURFACE ANATOMY OF LARYNX / HYOID / THYROID / CRICOID
  – “FIX” THE LARYNX AGAINST PREVERTEBRAL FASCIA

• PERFORM CRICOTHYROTOMY

• CONVERT TO FORMAL TRACHEOSTOMY
  – ( OR OTHER SAFE AIRWAY eg FIBREOPTIC ET TUBE)
  – AS SOON AS PATIENT IS STABLE
  – BETTER Sized AIRWAY
  – SAFER AIRWAY / EASIER TO SECURE
CRICOTHYROIDOTOMY

Figure 2. Landmarks for Cricothyroidotomy.
FIG. 57-6. Percutaneous dilational tracheotomy with bronchoscopic monitoring. The endotracheal tube is pulled back into the glottis so that the puncture site can be seen with the bronchoscope.
TRACHEOSTOMY
INDICATIONS FOR TRACHEOSTOMY

- UPPER AIRWAY OBSTRUCTION
- IMPROVEMENT OF RESPIRATION
- PROVISION OF VENTILATION
INDICATIONS FOR TRACHEOSTOMY - UPPER AIRWAY OBSTRUCTION

- UPPER AIRWAY OBSTRUCTION
  - SITE
    - SUPRAGLOTTIS
      - SUPRAGLOTTIC LARYNX / OROPHARYNX / MOUTH
    - GLOTTIS
    - SUBGLOTTIS
  - CONGENITAL
    - WEBS
    - SUBGLOTTIC HAEMANGIOMA
    - BILATERAL VOCAL CORD PALSY
    - LARYNGO MALACIA +/- TRACHEO MALACIA
    - PIERRE - ROBIN SYNDROME
  - ACQUIRED
    - TRAUMA (face, jaws, oral cavity, pharynx)
    - INFECTION (acute epiglottitis, laryngo-tracheo-bronchitis)
    - INFLAMMATION (burns, caustic ingestion)
    - IATROGENIC
    - TUMOURS
    - ANGIOEDEMA
    - SLEEP APNOEA
INDICATIONS FOR TRACHEOSTOMY
- IMPROVEMENT OF RESPIRATION

- IMPROVEMENT OF RESPIRATION
  - BY REDUCTION OF DEAD SPACE
  - BY REMOVING BRONCHIAL SECRETIONS
  - BY PROTECTION FROM ASPIRATION OF ORAL SECRETIONS
INDICATIONS FOR TRACHEOSTOMY - PROVISION OF VENTILATION

• FOR PROLONGED POSITIVE PRESSURE VENTILATION WHEN VOLUNTARY & SPONTANEOUS RESPIRATION IS NOT POSSIBLE

• CLOSED HEAD INJURY
• POLIO
• TETANUS
PERCUTANEOUS DILATION TRACHEOSTOMY
SURGICAL TRACHEOSTOMY

GOOD PATIENT POSITION (neck extension)

GOOD LIGHT

GOOD SUCTION

GOOD HAEMOSTASIS (beware of diathermy)

GOOD ASSISTANT
Cricoid Hook & Tracheal Dilator
OPEN TRACHEOSTOMY

LANDMARKS

SKIN INCISION

INfiltration

PLATYSMA & VEINS
Types of Tracheostomy tubes

Cuffed
(allows ventilation & protects from aspiration)

Uncuffed

Non fenestrated
Fenestrated
(allows speech)

Shiley
Portex
Aftercare

- **Bedside equipment**
  - Cricoid Hook & Dilator
  - Introducer
- **Humidification**
  - Humidifiers via mask or T-tube
  - HME, Swedish nose
  - Saline
- **Tracheal Toilet**
  - Increased secretions because of foreign body
  - Frequent suction followed by bagging with Ambu bag
- **Cuff**
  - 20 – 30 cm H$_2$O
  - Minimal leak technique
  - Low pressure, high volume
  - Deflate 8 hrly
- **Tube changes**
  - Timing
  - Pitfalls/ tips
  - (Use catheter or flexible bronchoscope)
- **Phonation**
- **Decannulation**
COMPLICATIONS OF TRACHEOSTOMY

• IMMEDIATE

• INTERMEDIATE

• LATE
COMPLICATIONS OF TRACHEOSTOMY - IMMEDIATE

- IMMEDIATE
  - MISPLACED TUBE (FALSE TRACT)
    - BIG / THICK NECK
    - EFFORTFUL COUGHING
  - HAEMORRHAGE (VENOUS CONGESTION)
    - THYROID, JUGULAR VEINS
  - SUBCUTANEOUS EMPHYSEMA
  - PNEUMOMEDIASTINUM
  - PNEUMOTHORAX
    - POSITIVE PRESSURE VENTILATION
    - COUGHING / AIR SUCTION
    - INCISION INTO PLEURA
  - AIR EMBOLISM
  - APNOEA
  - CARDIAC ARREST
  - LOCAL TISSUE DAMAGE
    - CRICOID
    - TRACHEAL CARTILAGE
    - RECURRENT LARYNGEAL NERVE
COMPLICATIONS OF TRACHEOSTOMY - INTERMEDIATE

• INTERMEDIATE

• (PPPPPPP ! ) – GOOD INTENSIVE NURSING CARE
  – REGULAR & CAREFUL ASEPTIC SUCTION / CUFF CHECK etc
  – ACCIDENTAL DECANNULATION
  – CRUSTING
  – INFECTION
  – TRACHEAL NECROSIS
  – TRACHEO-ARTERIAL FISTULA
  – TRACHEO-OESOPHAGEAL FISTULA
  – DYSPHAGIA
COMPLICATIONS OF TRACHEOSTOMY – LATE

• LATE
  – TRACHEAL STENOSIS
  – TRACHEO-CUTANEOUS FISTULA
  – SCAR
  – DIFFICULT DECANNULATION
    • PERSISTENCE OF PROBLEM REQUIRING TRACHEOSTOMY
    • ANTERIOR TRACHEAL WALL DISLOCATION
    • GRANULATION AROUND STOMA
    • SUBGLOTTIC STENOSIS
    • TRACHEOMALACIA
LARYNGOTRACHEOPLASTY FOR SUBGLOTTIC STENOSIS
summary
Summary of structures to consider in UAO

- Palatine tonsil
- Tongue
- Oro pharynx
- Retropharyngeal space
- Root of tongue
- Geniohyoid muscle
- Mylohyoid muscle
- Submandibular space
- Vallecula
- Epiglottis
- Hypopharynx
- Vocal cord
- Thyroid cartilage
- Larynx
- Cricoid cartilage
- Trachea
- Sternum
Summary of causes of UAO

- **Traumatic causes**
  - Laryngeal stenosis
  - Airway burn
  - Acute laryngeal injury
  - Facial trauma (mandibular or maxillary fractures)
  - Hemorrhage

- **Infections**
  - Suppurative parotitis
  - Retropharyngeal abscess
  - Tonsillar hypertrophy
  - Ludwig’s angina
  - Epiglottitis
  - Laryngitis
  - Laryngotracheobronchitis (croup)
  - Diphtheria

- **Iatrogenic causes**
  - Tracheal stenosis post-tracheostomy
  - Tracheal stenosis post-intubation
  - Mucous ball or Blood crust from transtracheal catheter

- **Foreign bodies**

- **Vocal cord paralysis**

- **Tumors**
  - Laryngeal tumors (benign or malignant)
  - Laryngeal papillomatosis
  - Tracheal stenosis (caused by intrinsic or extrinsic tumors)

- **Angioedema**
  - Anaphylactic reactions
  - C1 inhibitor deficiency
  - Angiotensin-converting enzyme inhibitors
Algorithm for management of Upper Airway Obstruction

- Stridor suggestive of UAO

Quick history and physical examination

- Impending respiratory failure
  - Urgent establishment of patent airway
    - Is ET intubation possible?
      - Yes: Direct or Fibre-optic intubation
      - No: Cricothyroidotomy vs Tracheotomy

- Gradual onset and mild symptoms
  - Selection of appropriate ancillary studies:
    - Laryngo-Bronchoscopcy
    - CT upper airway
    - Spirometry
References

Tracheostomy: A Multi-Professional Handbook
edited by Claudia Russell, Basil Matta

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The best way to find yourself is to lose yourself in the service of others.