

Head & Neck Trauma

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Mechanisms of Trauma

- **MVA**
- **Iatrogenic**
- **Burns and frostbite**
- **Noise**
- **Barotrauma**
- **Lightning**

Auricle injuries

- Hematomas
separate the perichondrium (blood supply) from the cartilage
→ excise fibrous tissue
- Apply pressure dressing , drain
- Avulsion:
 - Reimplantation
 - Microvascular anastomosis



PROSECTUM

PROSECTUM



Cauliflower Ear

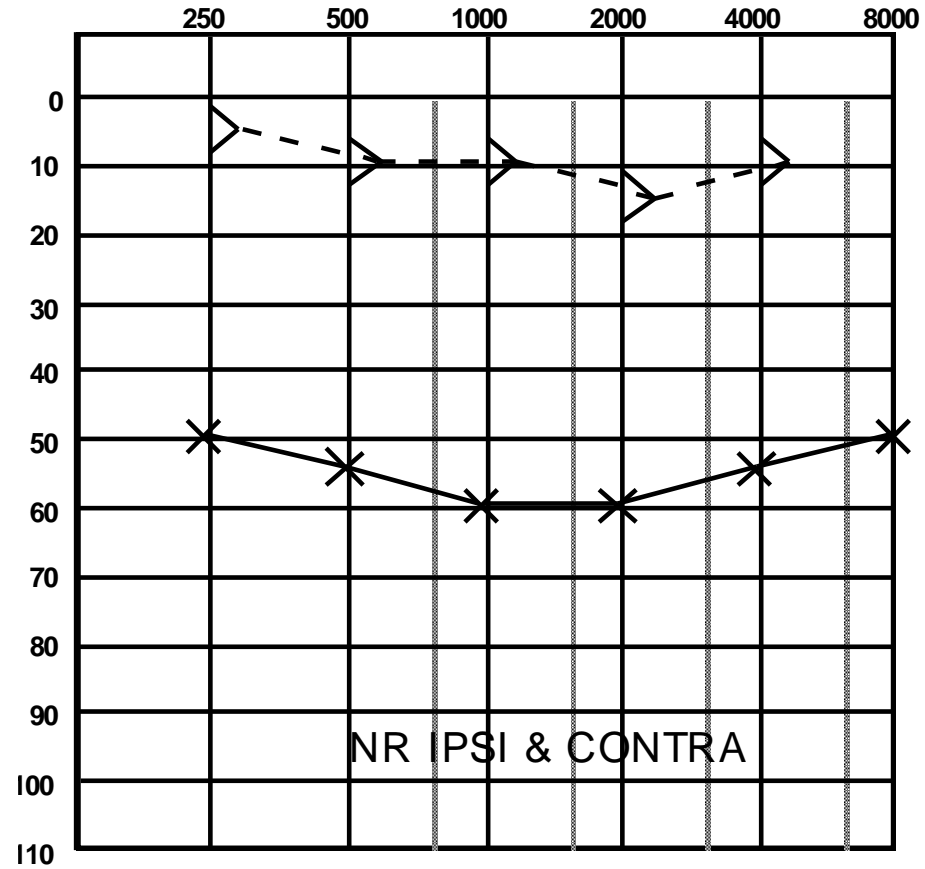


Complications of Ear-Piercing



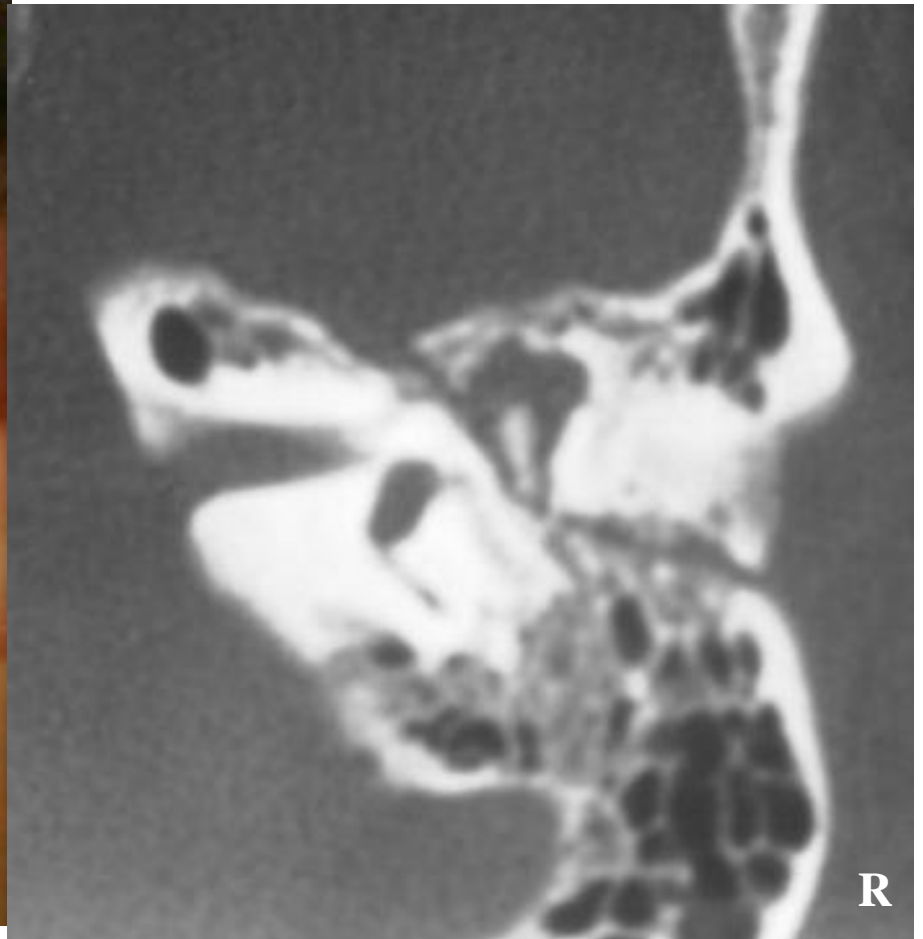
Case

LEFTEAR (AS)

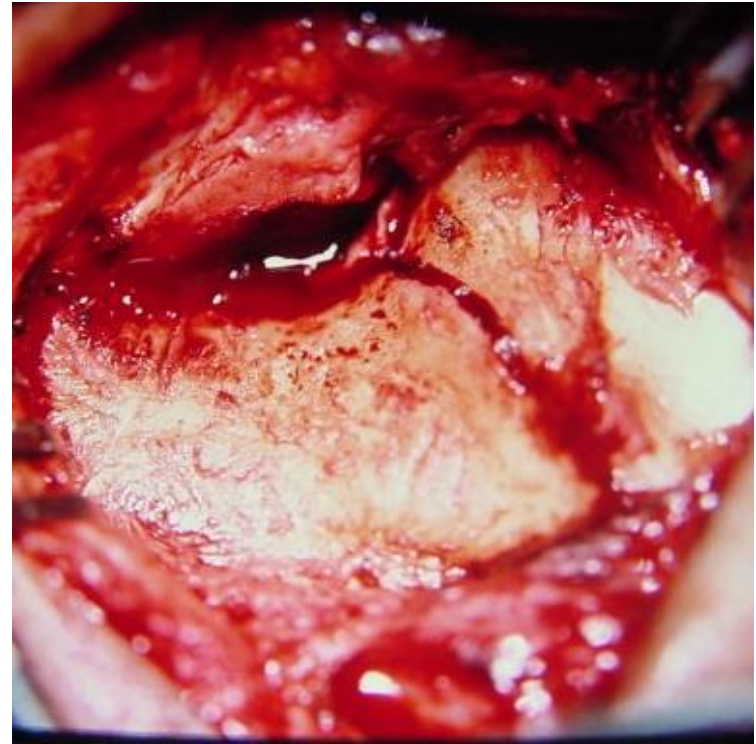
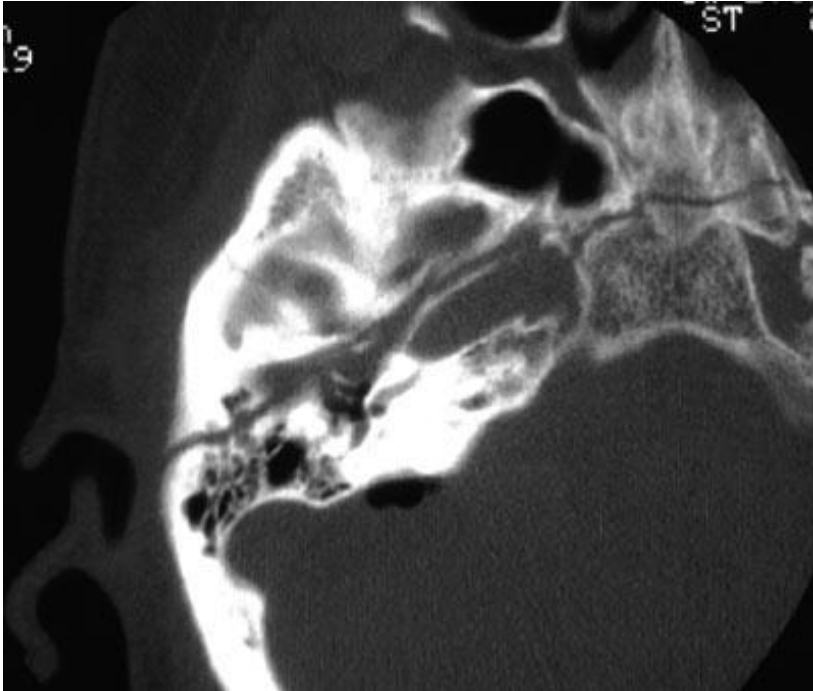


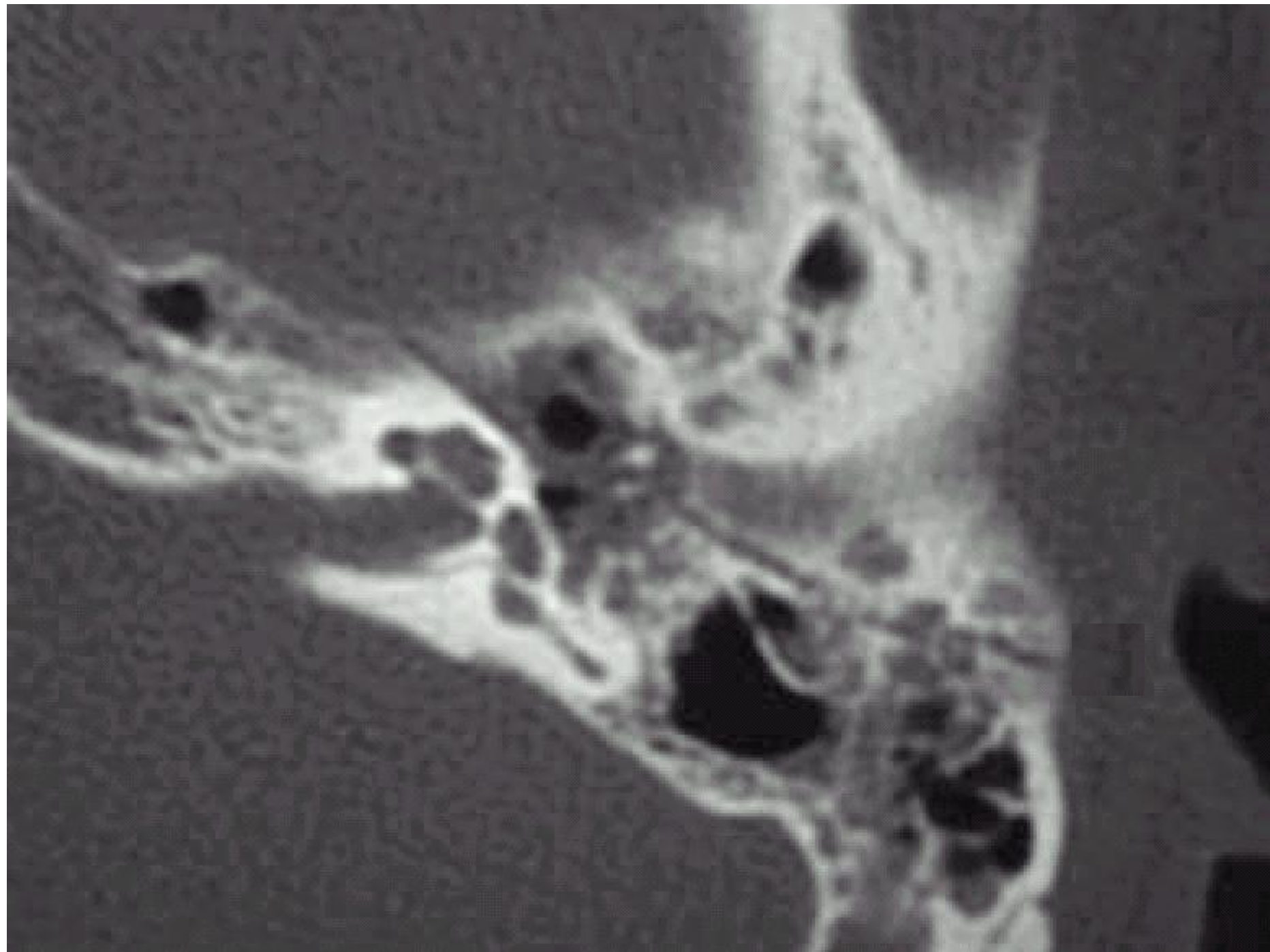
Hemotympanum





Longitudinal TB#





Complications of TB#

- Hearing loss
- Vertigo
- Tinnitus
- Facial paralysis
- CSF leak
- Carotid injury



Naso-orbital Ethmoid and Frontal Sinus Fractures



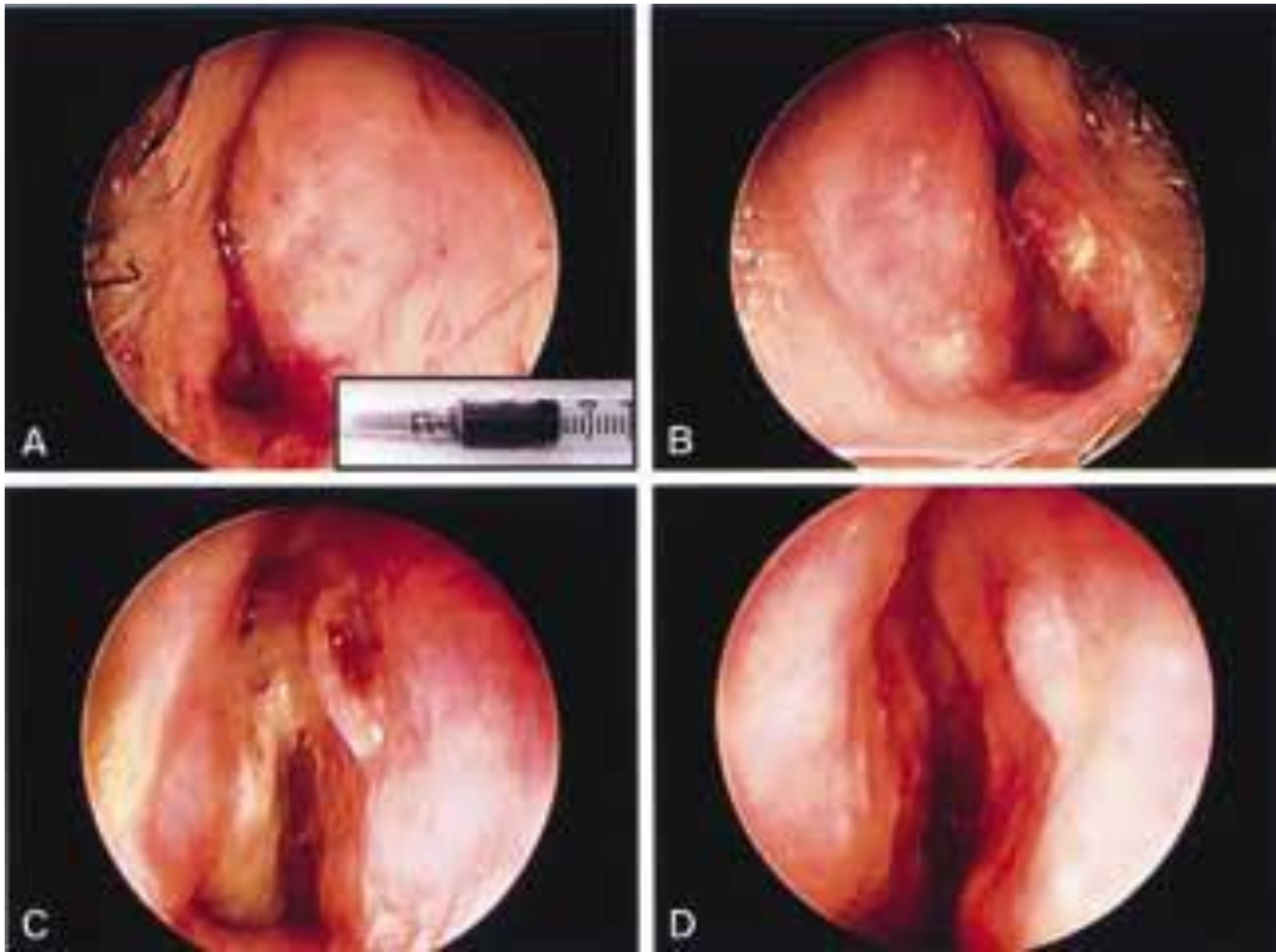
Naso-orbital Ethmoid Fractures

Failure of Diagnosis
Leads to Significant
Facial Deformities



Septal hematoma





Nasal Fracture with Septal Hematoma

Complication

Nasal Deformity

- Flattened Nasal Dorsum
- Septal Deviation / Dislocation

Intracranial Involvement

- Cerebrospinal Fistula
- Pneumocephalus

Goals of Management

- ABCD
- Soft Tissue Repair
- Framework Reconstitution
 - Nasas Region
 - Orbital
 - Nasal Support
 - Sinus



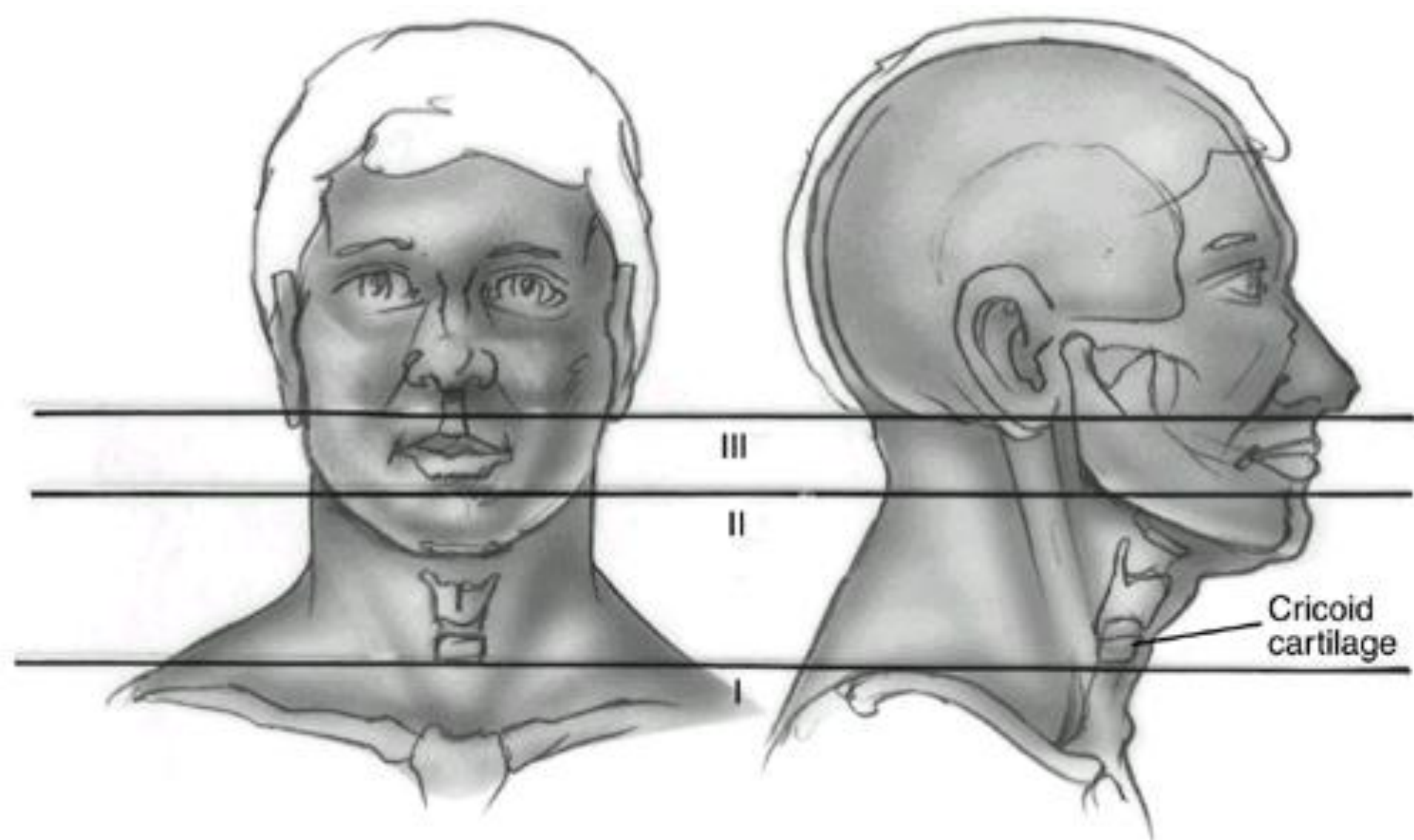


FIG. 73-8. Horizontal entry zones of the neck for penetrating injuries to the neck.
(Modified from Jurkovich GJ. The neck. In: Early care of the injured patient. Moore EE, ed. Toronto: BC Becker, 1990:126.)

Anatomy/Zone I

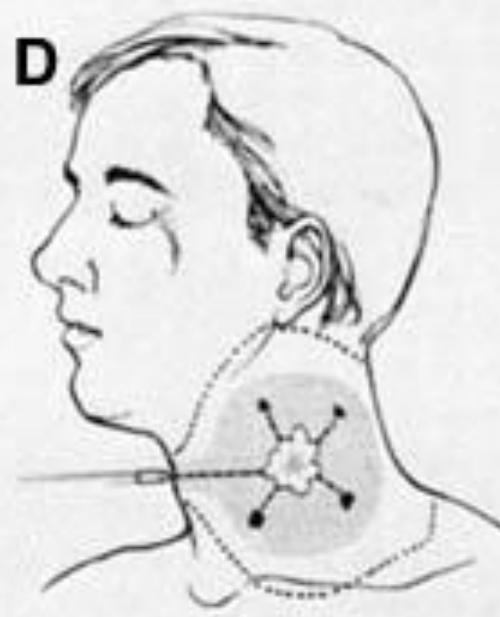
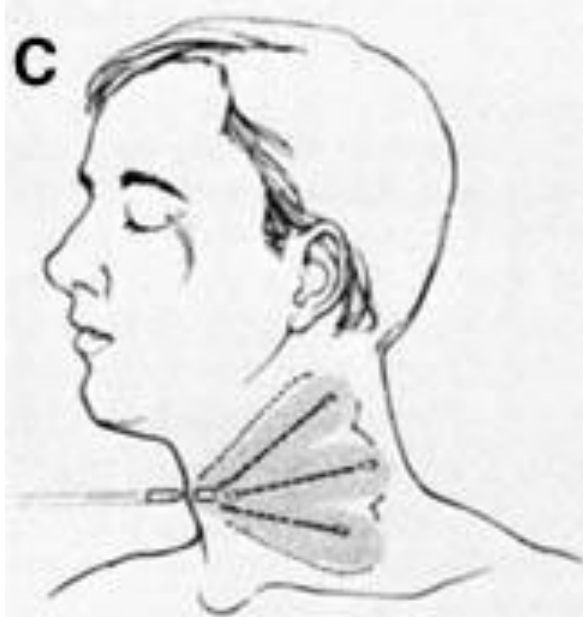
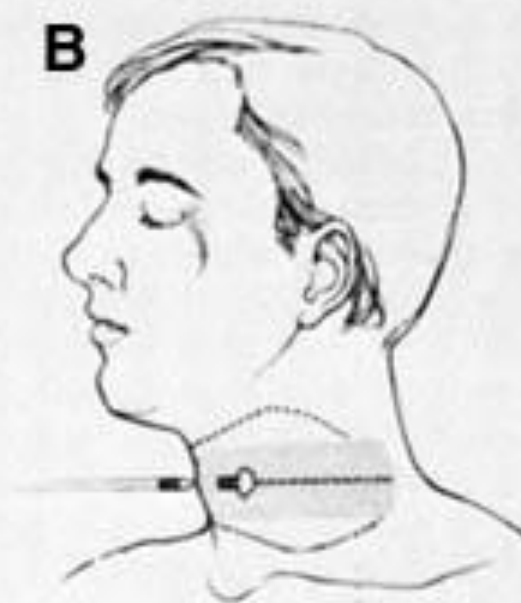
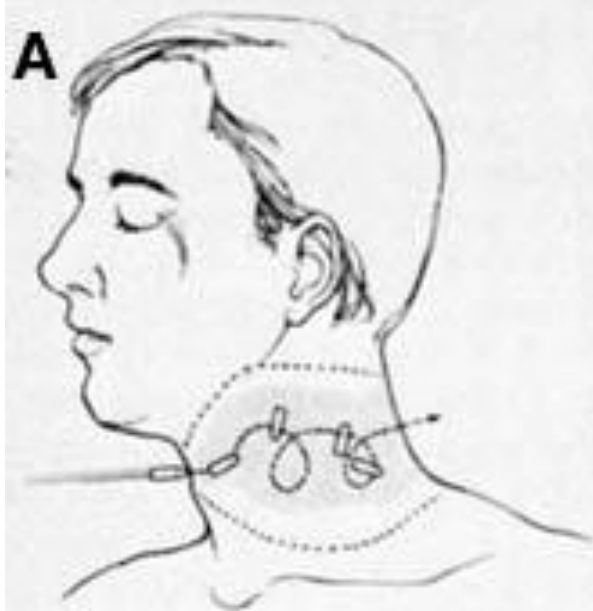
- Cricoid → sternum and clavicles
- Contains the
 - Subclavian arteries and veins
 - Dome of the pleura
 - Esophagus
 - Great vessels of the neck +recurrent nerve
 - Trachea
- S/S may be hidden from inspection in the mediastinum or chest

Anatomy/Zone II

- Cricoid → Angle of the mandible
- Contains the
 - Larynx
 - Pharynx
 - Carotid artery and jugular vein
 - Phrenic, vagus, and hypoglossal nerves
- Injuries here are seldom occult
- Common site of carotid injury

Anatomy/Zone III

- Lies above the angle of the mandible
- Contains the
 - Internal and external carotid arteries
 - Vertebral artery
 - Several cranial nerves
- Vascular and cranial nerve injuries common



History

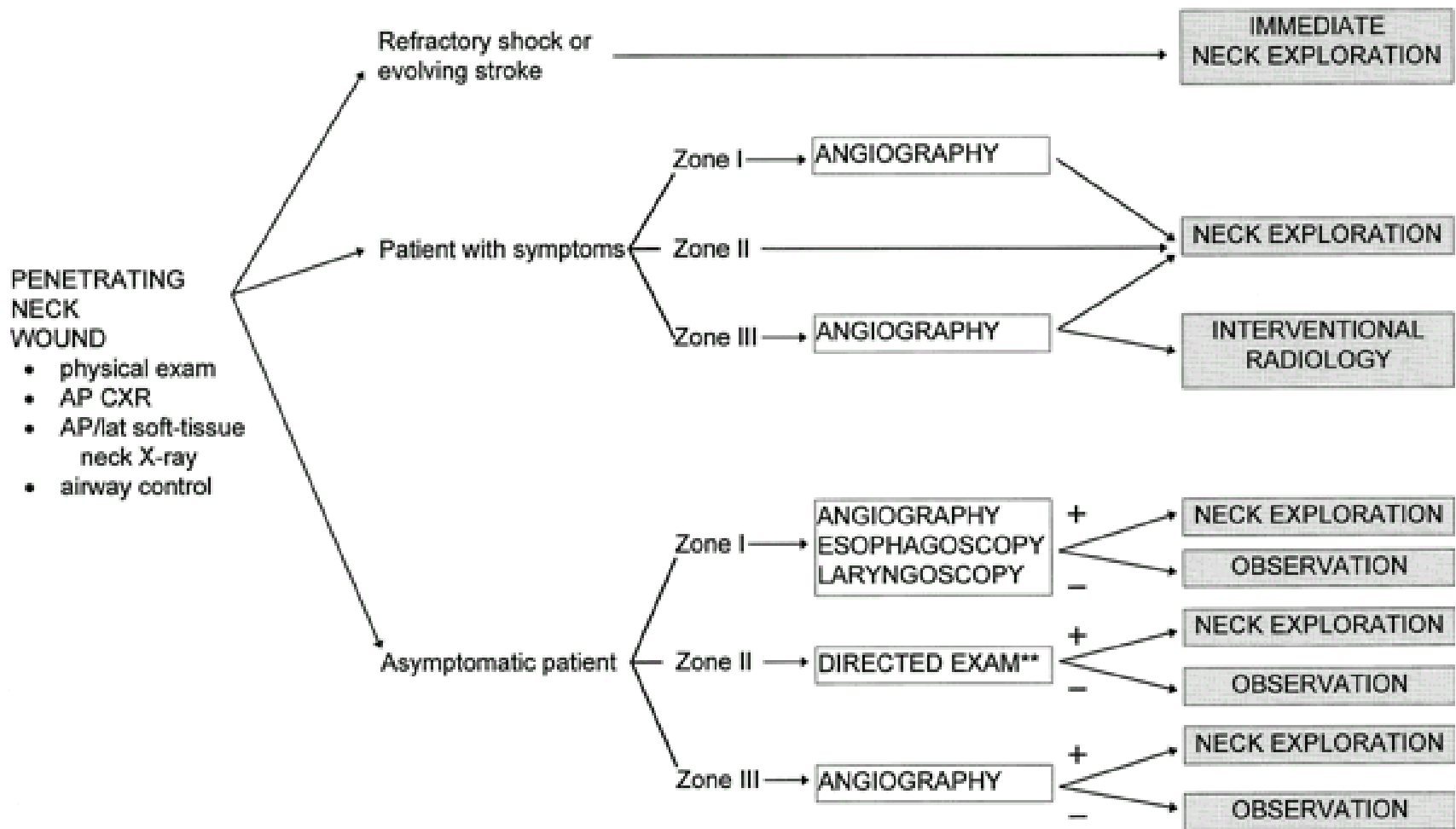
- Obtain from witnesses, patient
- Mechanisms of injury - stab wounds, gunshot wound, high-energy, low-energy
- Estimate of blood loss at scene
- Any associated thoracic, abdominal, extremity injuries
- Neurologic history

Physical Examination

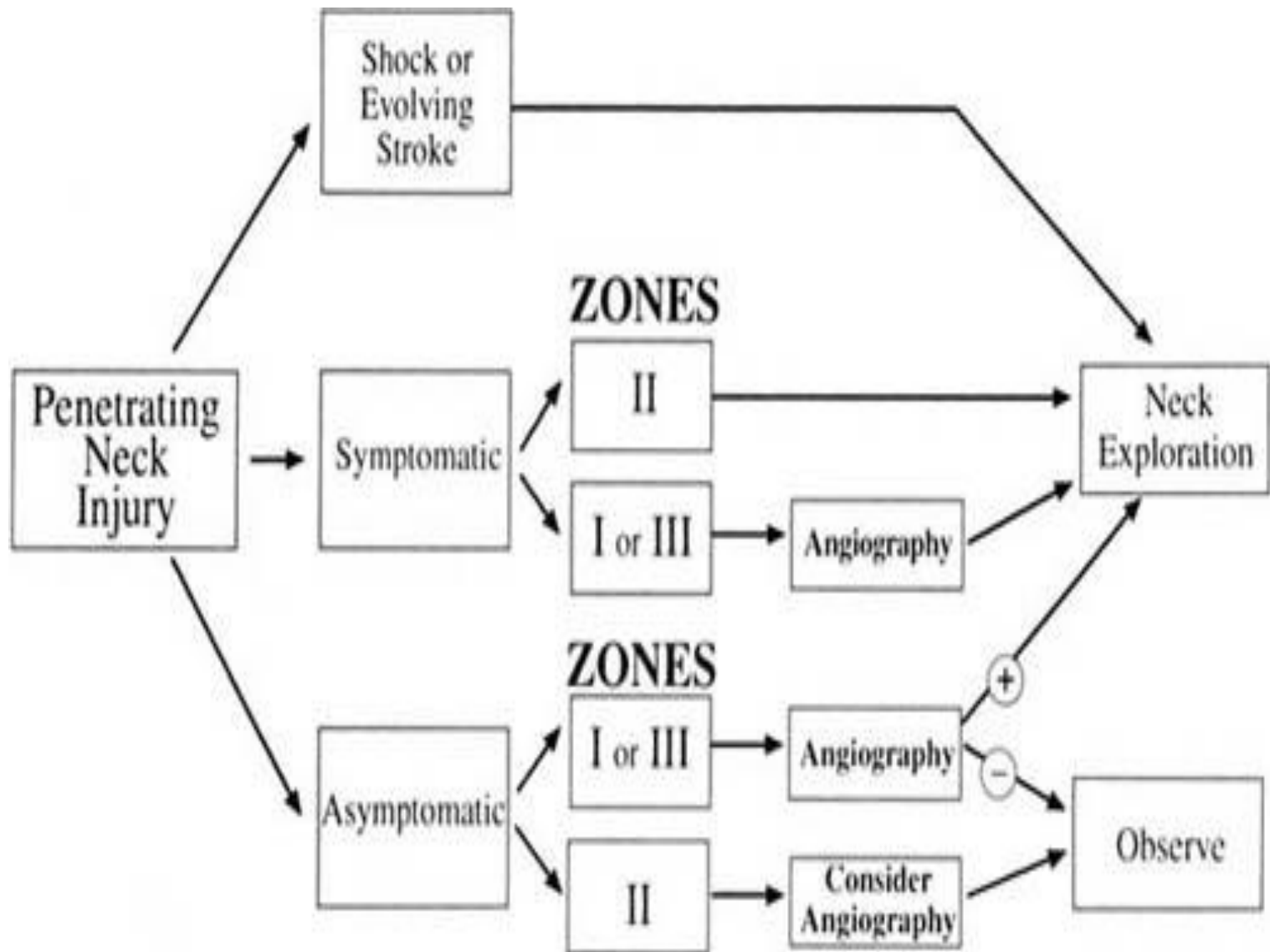
- Thorough head and neck exam
- Palpation and stethoscope (thrills and bruits)
- Neuro exam: mental status, cranial nerves, and spinal column
- Examine the chest, abdomen, and extremities
- Be sure to examine the back of the patient as
- Don't blindly explore wound or clamp vessel

Radiographs

- CXR - inspiratory/expiratory /Lateral
- Cervical spine film to rule out fractures
- Soft tissue neck films AP and Lateral
- CT Scan
- Arteriograms, contrast studies as indicated



**DIRECTED EXAM: Angiography, esophagoscopy, and/or laryngoscopy based on path of projectile and clinical exam



Impending Respiratory Failure

- Reduced air entry
- Severe work
- Cyanosis despite O₂
- Irregular breathing / apnea
- Altered Consciousness
- Diaphoresis

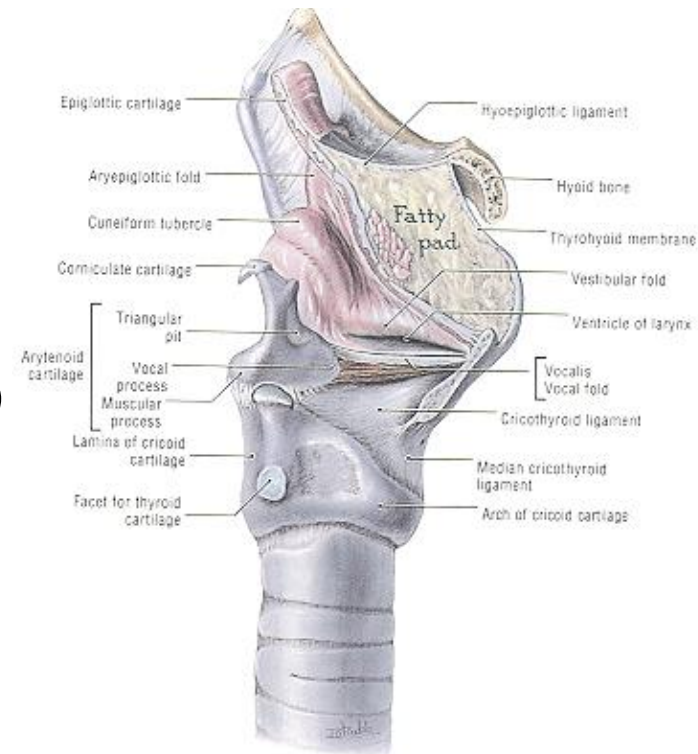
Intubation: Indications

- Failure to oxygenate
- Failure to remove CO₂
- Increased WOB
- Neuromuscular weakness
- CNS failure
- Cardiovascular failure

Laryngeal Trauma

Introduction

- **Functions**
 - **Airway**
 - **Voice**
 - **Swallowing**
- **Well protected (mandible, sternum)**
- **Support: Hyoid, thyroid, cricoid**
- **Outcome determined by initial management**



Mechanism of Injury

- **Blunt**

- MVA, strangulation, clothesline, sports related
- Significant internal damage, minimal signs

- **Penetrating**

- GSW: damage related to velocity
- Knife: easy to underestimate damage

Initial Evaluation

- ATLS principles ABCD
- Secure airway – local tracheotomy
- **Intubation can worsen airway**
- Avoid cricothyroidotomy
- Pediatric: tracheotomy over bronchoscope
- Clear C-spine

History

- Change in voice – most reliable
- Dysphagia
- Odynophagia
- Difficulty breathing - more severe injury
- Anterior neck pain
- Hemoptysis

Signs of Respiratory Distress

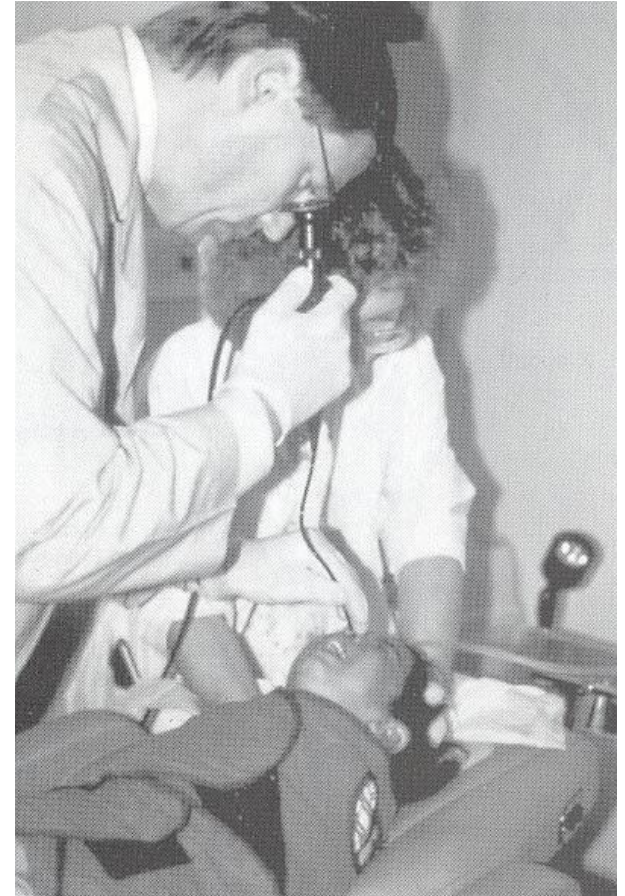
- Tachypnea
- Tachycardia
- Grunting
- Stridor
- Head bobbing
- Flaring
- Inability to lie down
- Agitation
- Retractions
- Access muscles
- Wheezing
- Sweating
- Prolonged expiration
- Pulsus paradoxus
- Apnea
- Cyanosis

Physical exam

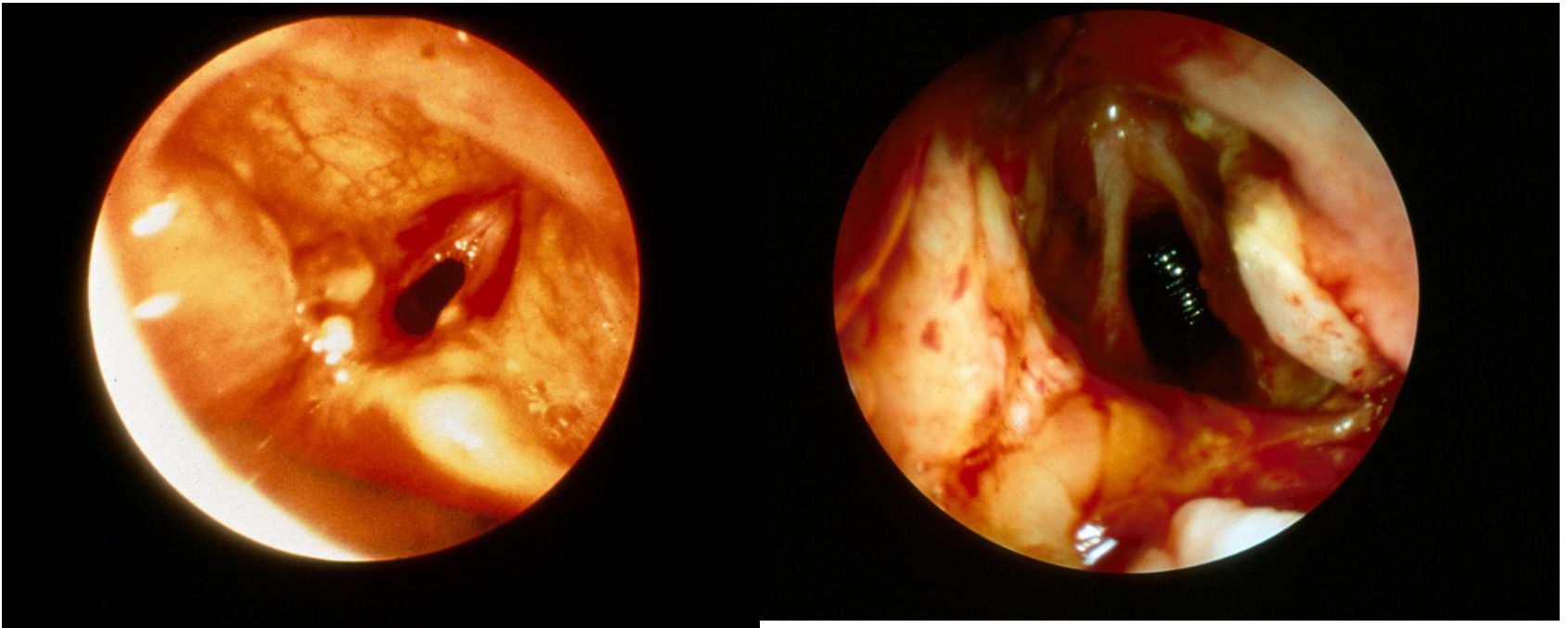
- Stridor
- Hoarseness
- Subcutaneous emphysema
- Laryngeal tenderness, ecchymosis, edema
- Loss of thyroid cartilage prominence
- Associated injuries - vascular, cervical spine, esophageal

Flexible Fiberoptic Laryngoscopy

- Perform in emergency room
- Findings dictate next step
 - CT scan
 - Tracheotomy
 - Endoscopic
 - Surgical Exploration
 - Other studies



Laryngoscopic Exam



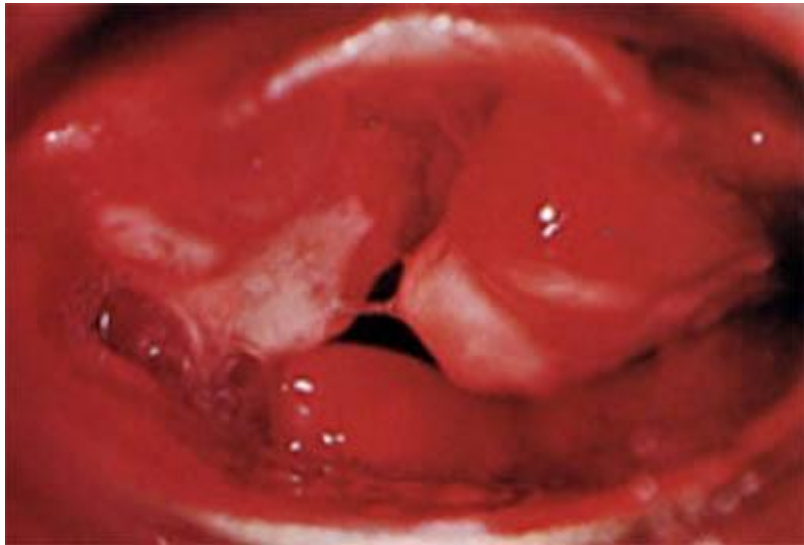




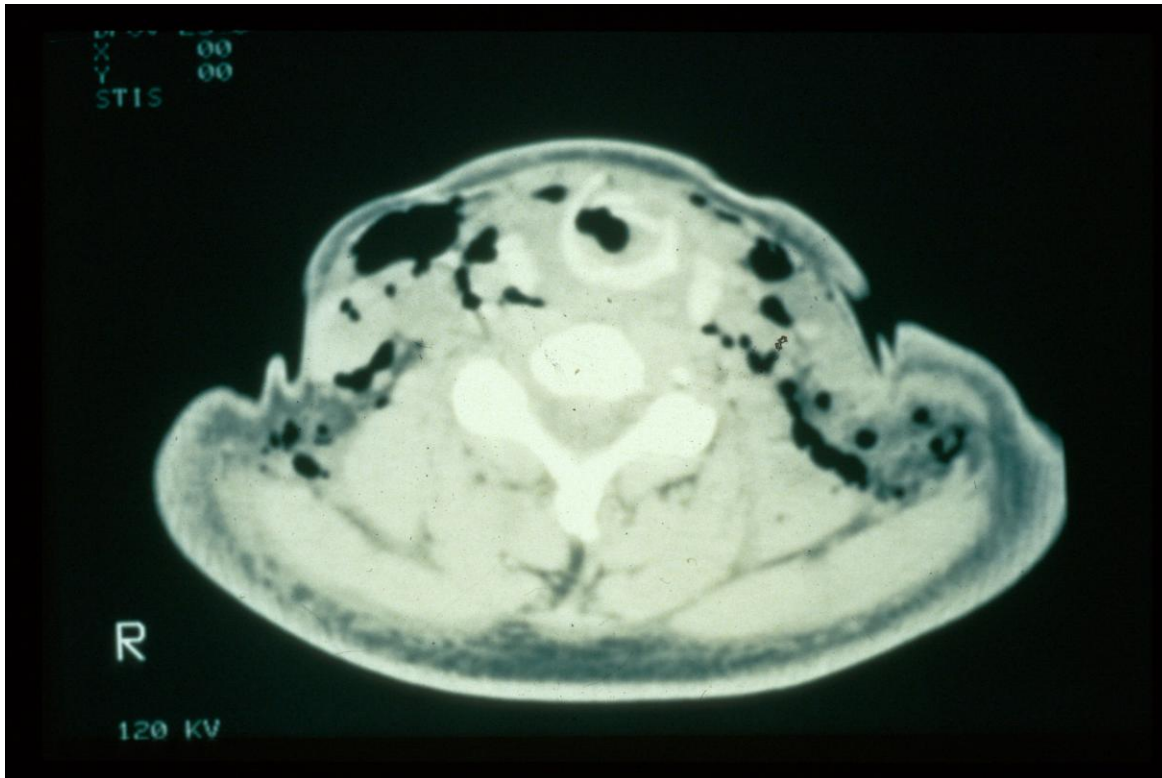
Figure 4: Corresponding photos and endoscopic views show the WuScope in use; the suction catheter entering the glottis first, then followed by the ETT.



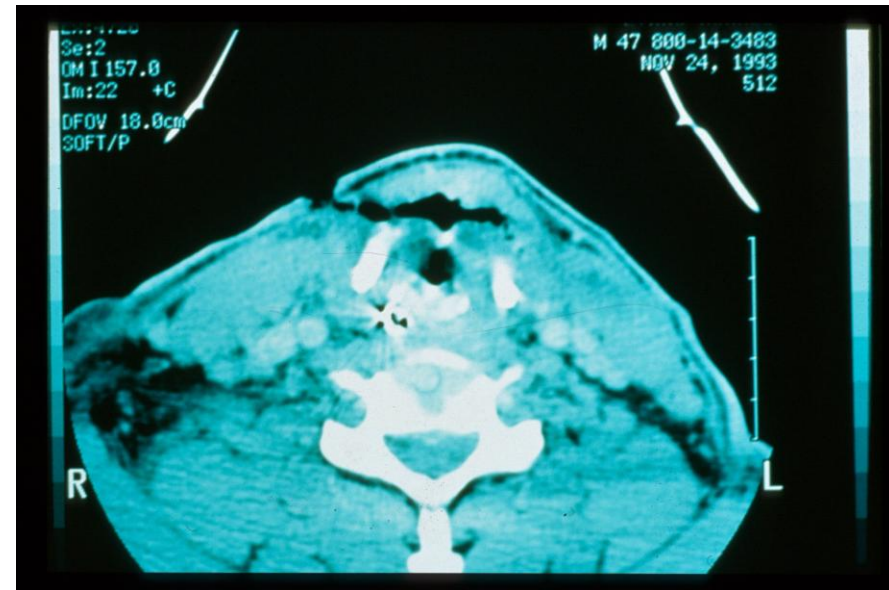
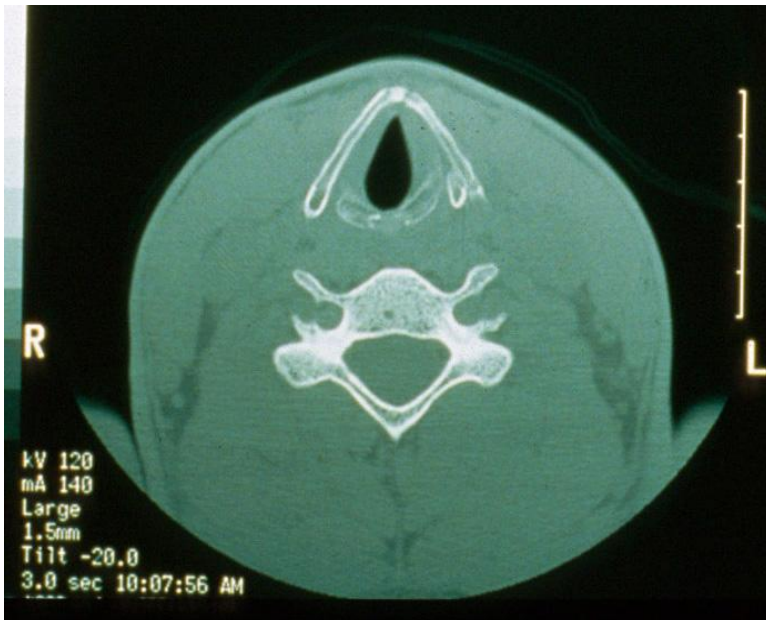
Radiographic Imaging

- C-spine
- CXR
- CT
- Angiography
- Contrast esophagrams

CT Scan



CT Scan



Laryngeal Trauma

Asymptomatic or minimal symptoms

F/L

CT scan

Mild Edema

Small hematoma

Non-displaced linear fracture

Intact mucosa

Small lacerations

Bed rest

Cool mist

Antibiotics

Steroids

Anti-reflux

Displaced fracture
(by CT or exam)

Loss of mucosa or extensive
laceration

Bleeding

Exposed cartilage

Tracheotomy

Panendoscopy

Explore

Laryngeal Trauma

Respiratory distress, open wounds, bleeding



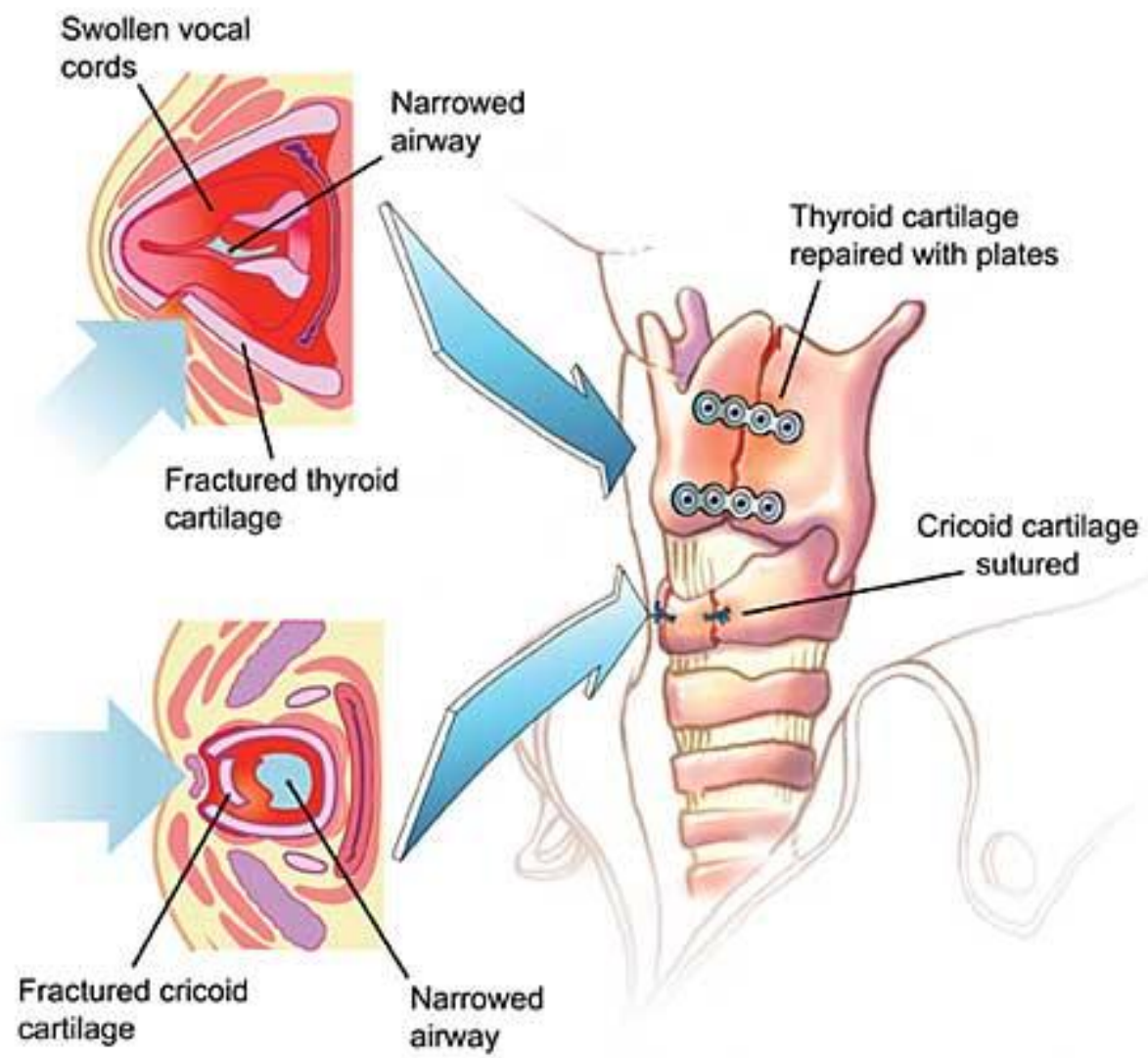
Tracheotomy



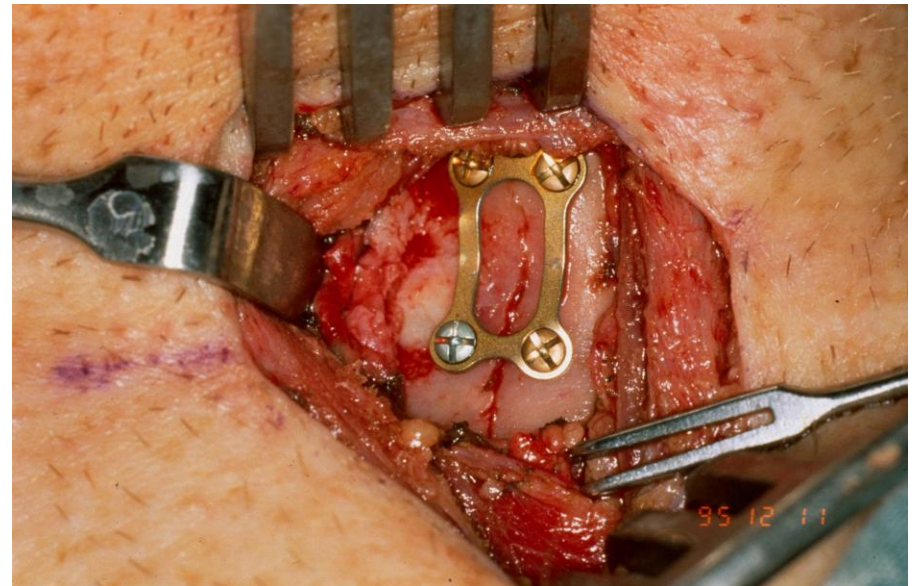
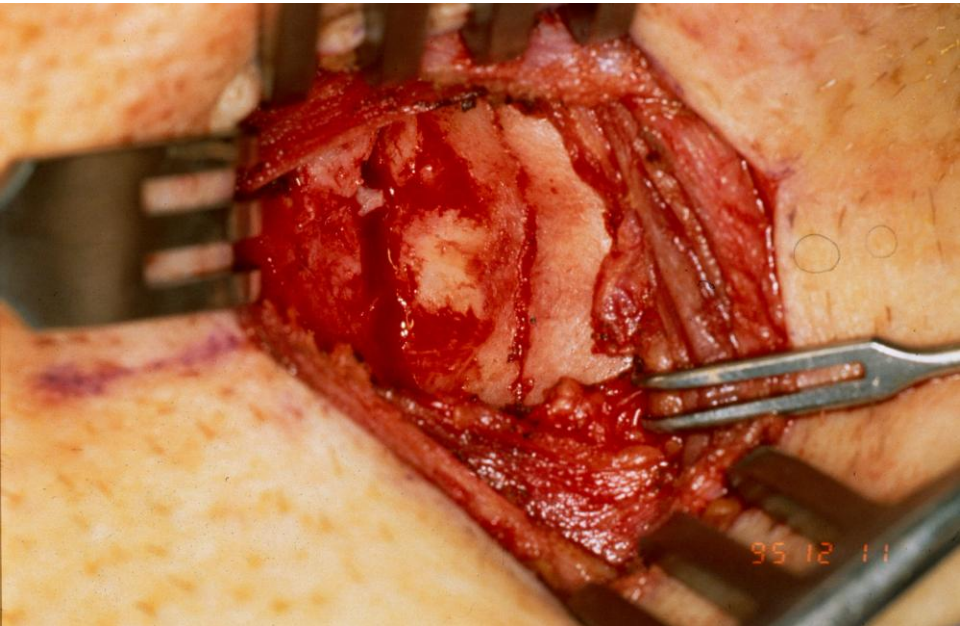
Panendoscopy



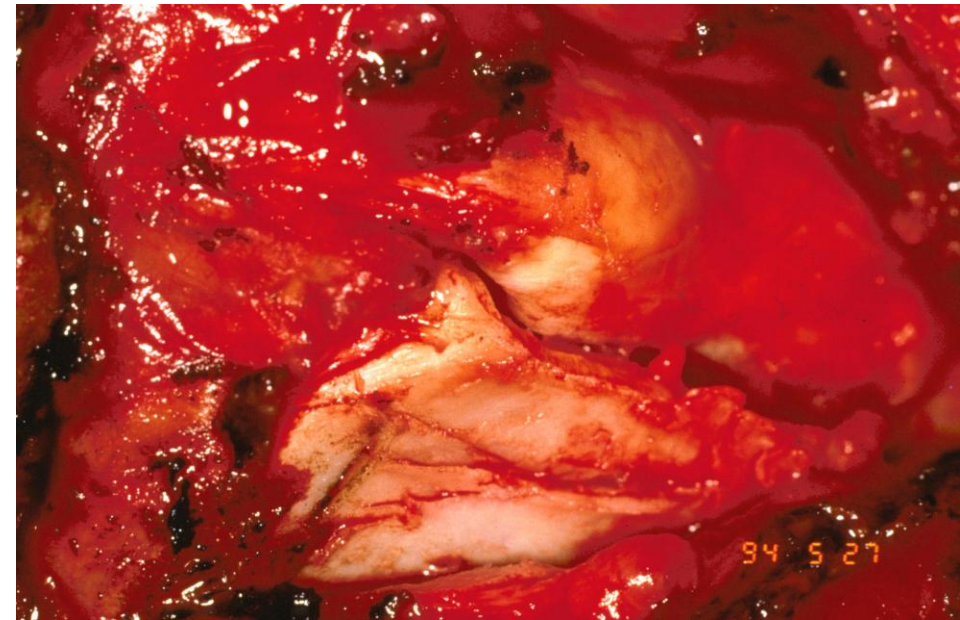
Explore



Laryngeal Framework Repair



Laryngeal Framework Repair



Treatment Goals

- Preservation of airway
- Prevention of aspiration
- Restoration of normal voice

NI-SNHIL

- 30 Y saudi solder
- Lt ear tinnitus
- Can not sleep
- Severe depression



Trauma & SNHL

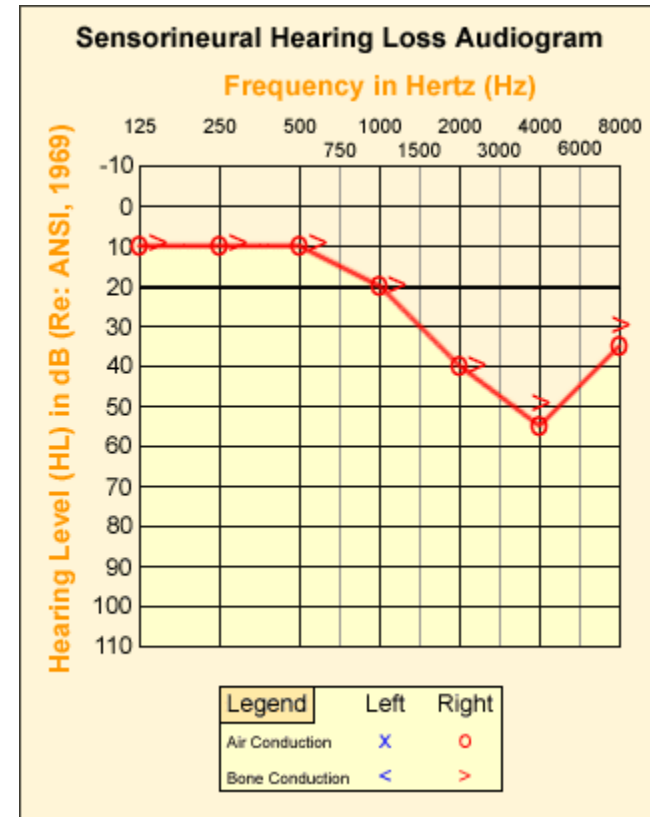
- **NISNHL**
- **Acoustic trauma**
- **Barotrauma**

Noise induce SNHL

- Boilermaker's deafness
- one of the most common occupationally induced disabilities
- (OSHA) Occupational Health and Safety Administration
- Tinnitus
 - commonly accompanied NISNHL
 - warning sign

Noise induce SNHL

- Usually is limited to 3, 4, and 6 kHz
- 4 kHz Greatest loss ?
- ?Susceptibility
 - Age, gender, race, and coexisting vascular disease Not been shown to correlate with susceptibility to NIHL
 - No known way to predict susceptibility



TTS vs PTS

- *Temporary threshold shift (TTS)*

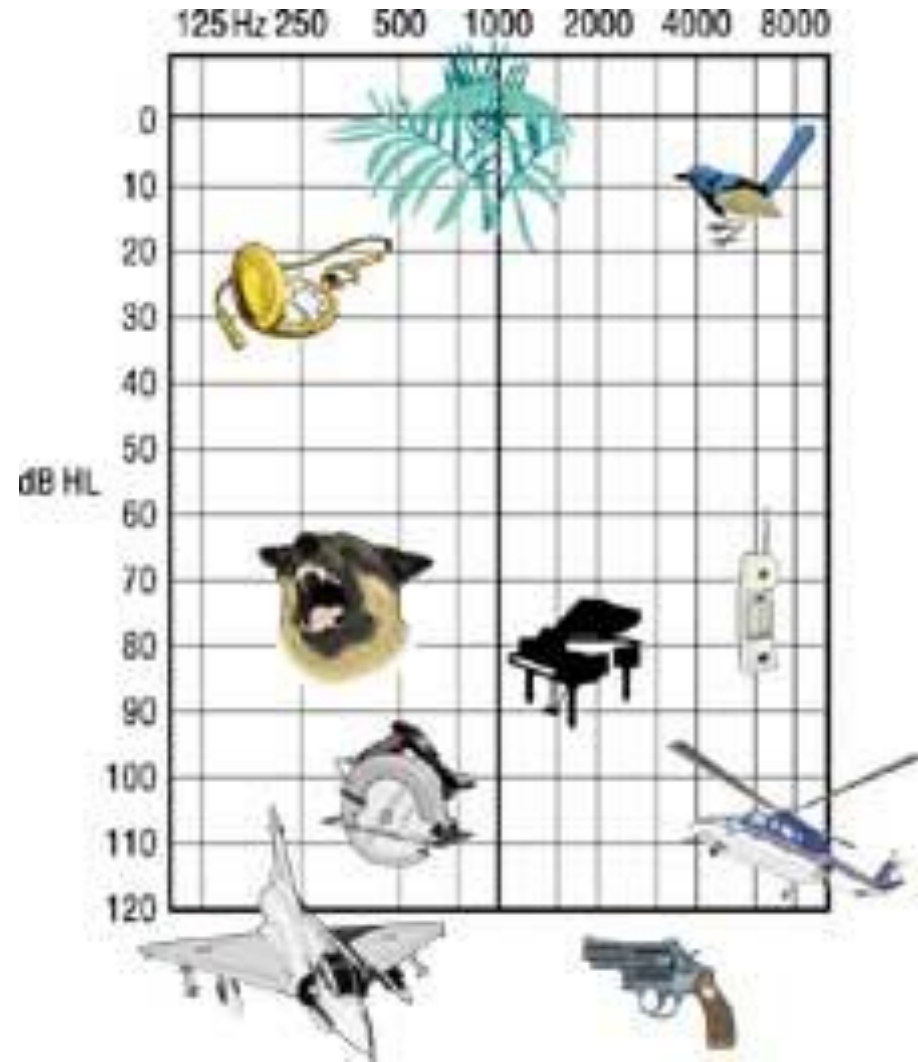
HL recovers over the next 24 to 48 hours

- *Permanent threshold shift (PTS)*



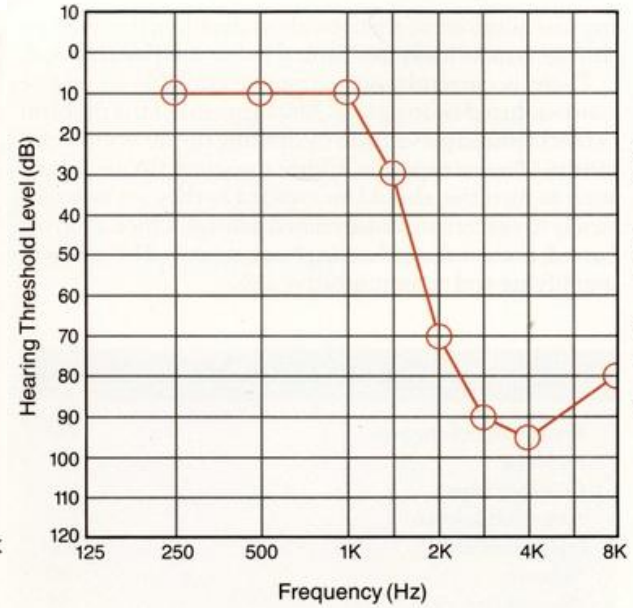
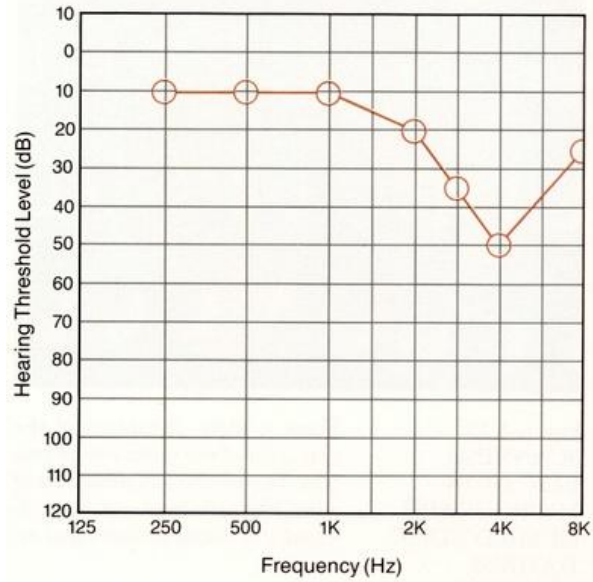
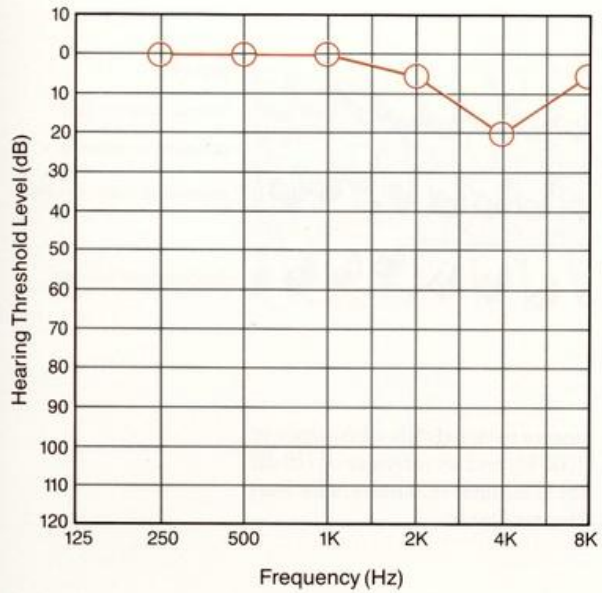
98

- 90 db for 8 hours
- 95 db for 4 hours
- 100 db for 2 hours
- 105 db for 1 hours



NOISE LEVELS (in dB)

Rocket launching pad	180
Jet plane	140
Gunshot blast	140
Automobile horn	120
Pneumatic drill	100
Subway	90
Average factory	85
Noisy restaurant	80
Busy traffic	75
Conversational speech	66
Average home	50
Quiet office	40
Soft whisper	30



Primary role of otolaryngologists

- Prevention
- Early identification.

Barotrauma

- Injury of the TM and middle ear
- Unequalized pressure differentials between the middle and external ears
- Flying or underwater diving
- ETD may predispose

S/S

- **Pain**
- **H.L**
- **hyperemia and possible TM perforation**
- **Edema and ecchymosis of the ME mucosa**
- **Conductive hearing loss**
- **Hemotympanum**
- **Transudative middle ear effusion**

Foreign Bodies of the Aerodigestive Tract

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Foreign Bodies

- Foreign body ingestion
- Foreign body aspiration
- Toddlers
 - Oral exploration
 - Easy distractibility
 - Cognitive development



Foreign Body Ingestion

- Coins
- Meat
- Vegetable matter
- Less than 24 hours in most

Foreign Body Aspiration

- Parental suspicion
- History
 - Choking
 - Gagging
 - Wheezing
 - Hoarseness
 - Dysphonia
- Can mimic asthma, croup, pneumonia
- “A positive history must never be ignored, while a negative history may be misleading”

Foreign Body Aspiration

- Physical exam
 - Larynx/cervical trachea
 - Inspiratory or biphasic stridor
 - Intrathoracic trachea
 - Prolonged expiratory wheeze
 - Bronchi
 - Unequal breath sounds
 - Diagnostic triad - <50%
 - Unilateral wheeze
 - Cough
 - Ipsilaterally diminished breath sounds
- Fiberoptic laryngoscopy

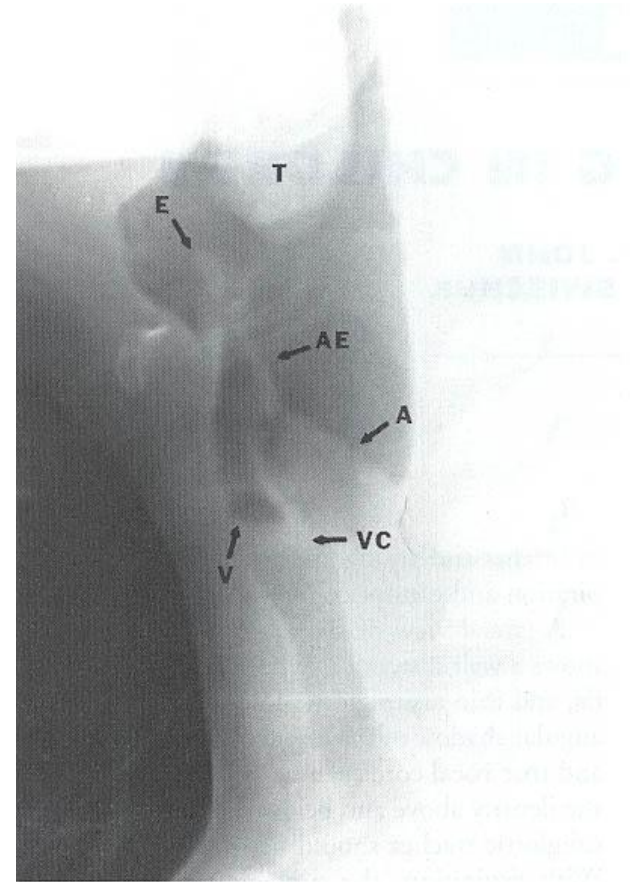
Flexible Laryngoscopy

- Proper Equipment
- Assess nares/choanae
- Assess adenoid and lingual tonsil
- Assess TVC mobility
- Assess laryngeal structures



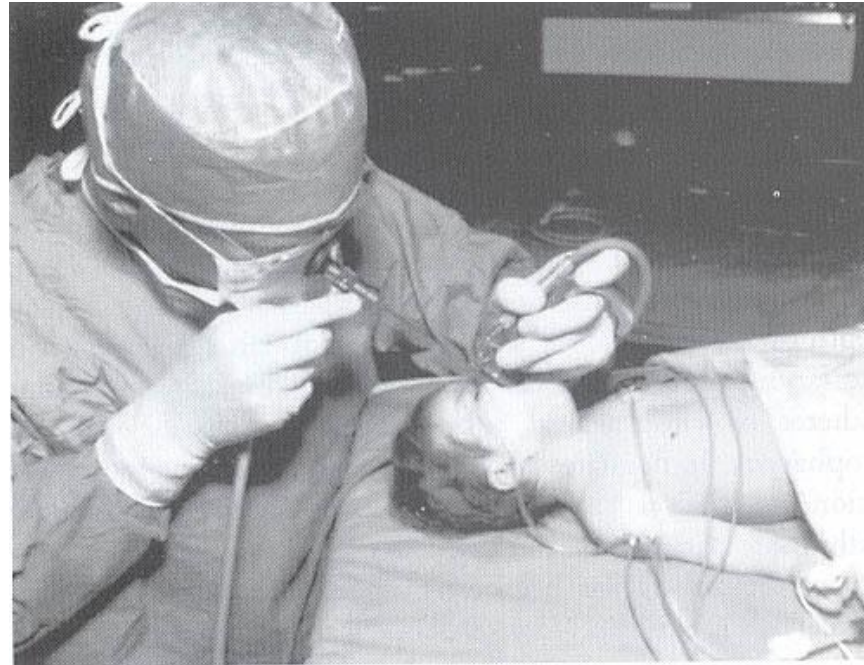
Radiology

- Plain films:
 - Chest and airway AP and lat
 - Expiratory films
- Fluoroscopy
- Barium Swallow
- CT, MRI, Angiography



Direct Laryngoscopy

- Insufflation technique:





**Button
Battery**

- 5y
- Unilateral discharge
- Foul smell





Foreign Body Ingestion

- Disc batteries
 - Emergency (Alkaline ? Acid)
 - NaOH, KOH, mercury
 - 1 hour – mucosal damage
 - 2 to 4 hours – muscular layers
 - 8 to 12 hours – perforation
 - Esophagoscopy
 - Observation for gastric location for 4-7 days
 - Laparotomy for bowel perforation

Foreign Body Ingestion

- Common locations
 - Cricopharyngeus
 - Aorta/left mainstem bronchus
 - Gastroesophageal junction

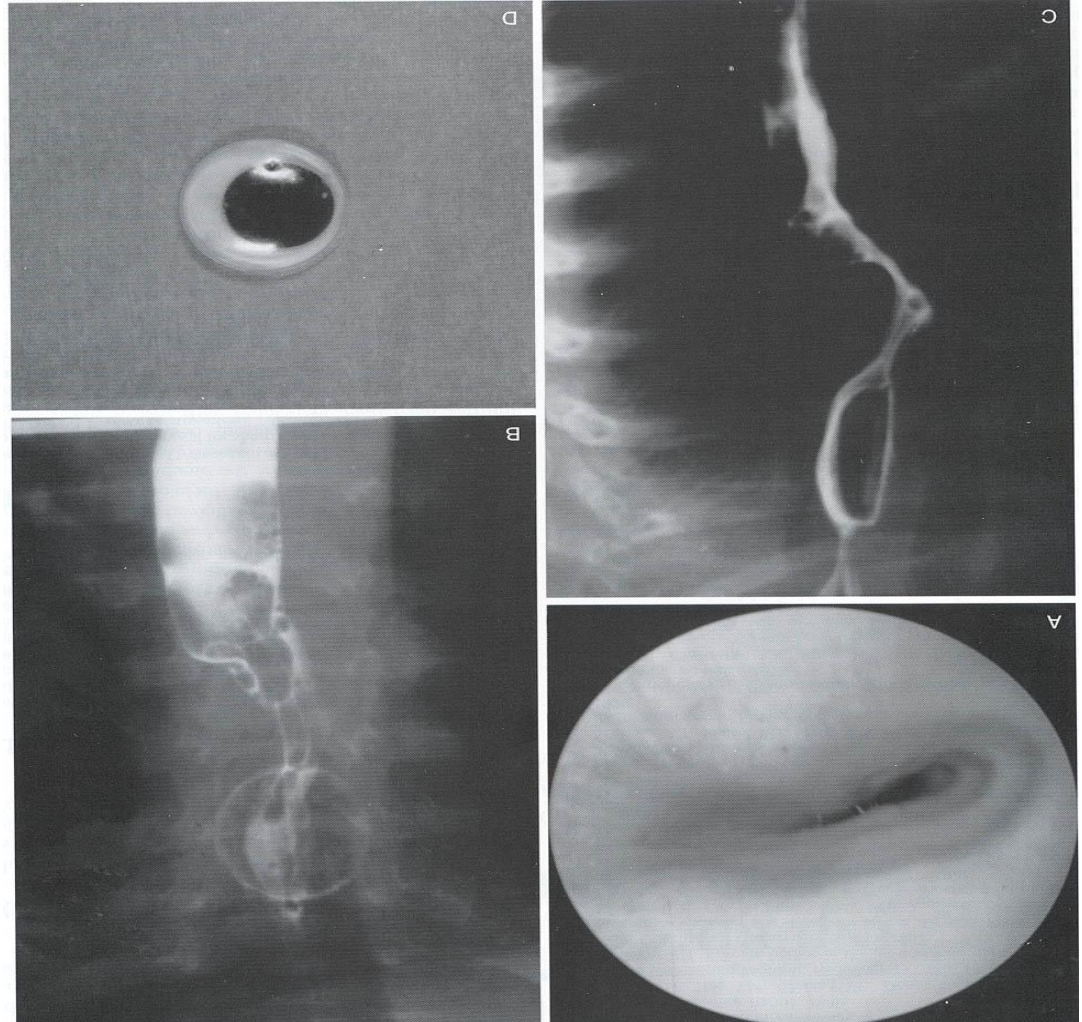
Foreign Body Ingestion

- Radiopaque
 - Coins
 - Cartilage/bones
- Radiolucent
 - Hot dogs
- Barium swallow



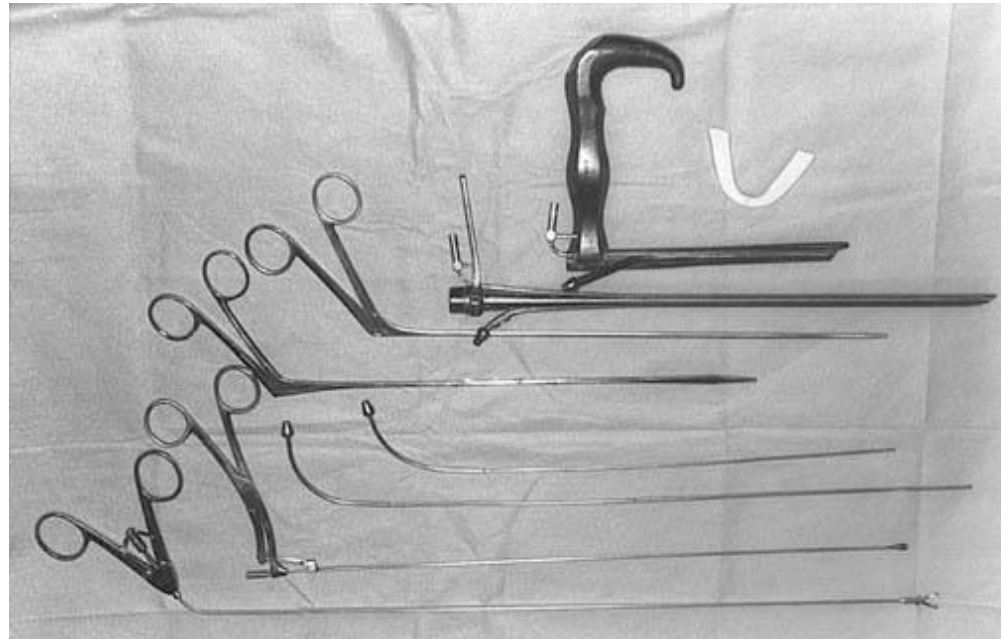
Foreign Body Ingestion

- Barium Swallow



Foreign Body Ingestion

- Removal
 - General anesthesia
 - Intubated
 - Esophagoscopy
 - Examine for ulceration/perforation



Foreign Body Ingestion

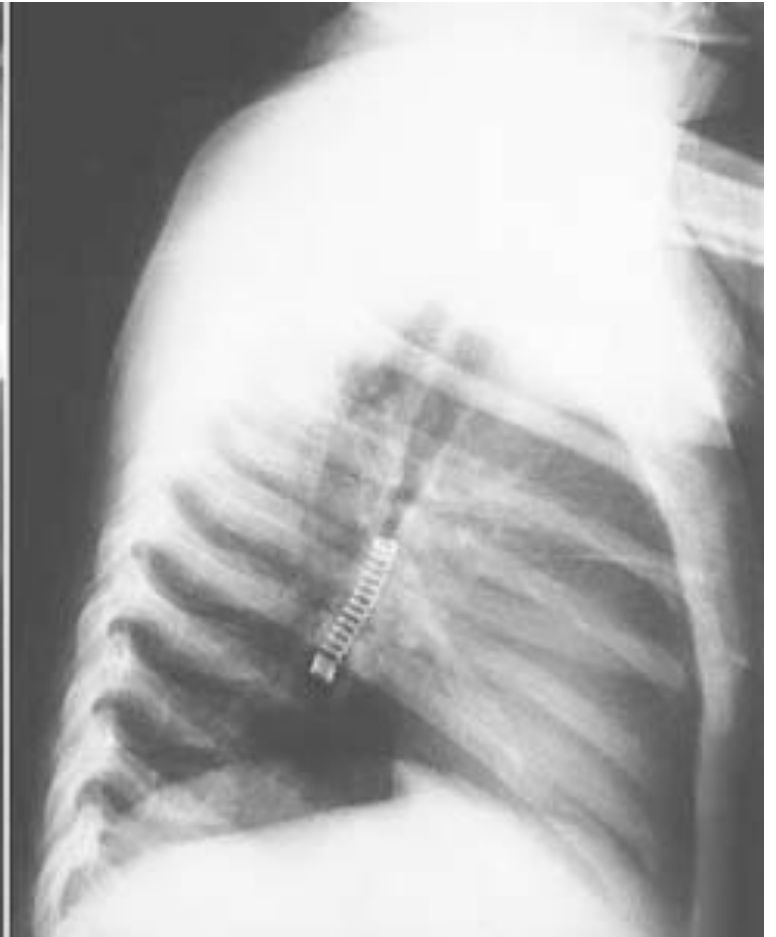
- Postoperative management
- NPO for 4-12 hours
- Perforation
 - Tachycardia
 - Tachypnea
 - Fever
 - Chest pain

Foreign Body Aspiration

- Radiography
 - PA & lateral views of chest & neck
 - Inspiration & expiration
 - Lateral decubitus views
 - Airway fluoroscopy
- 25% have normal radiography



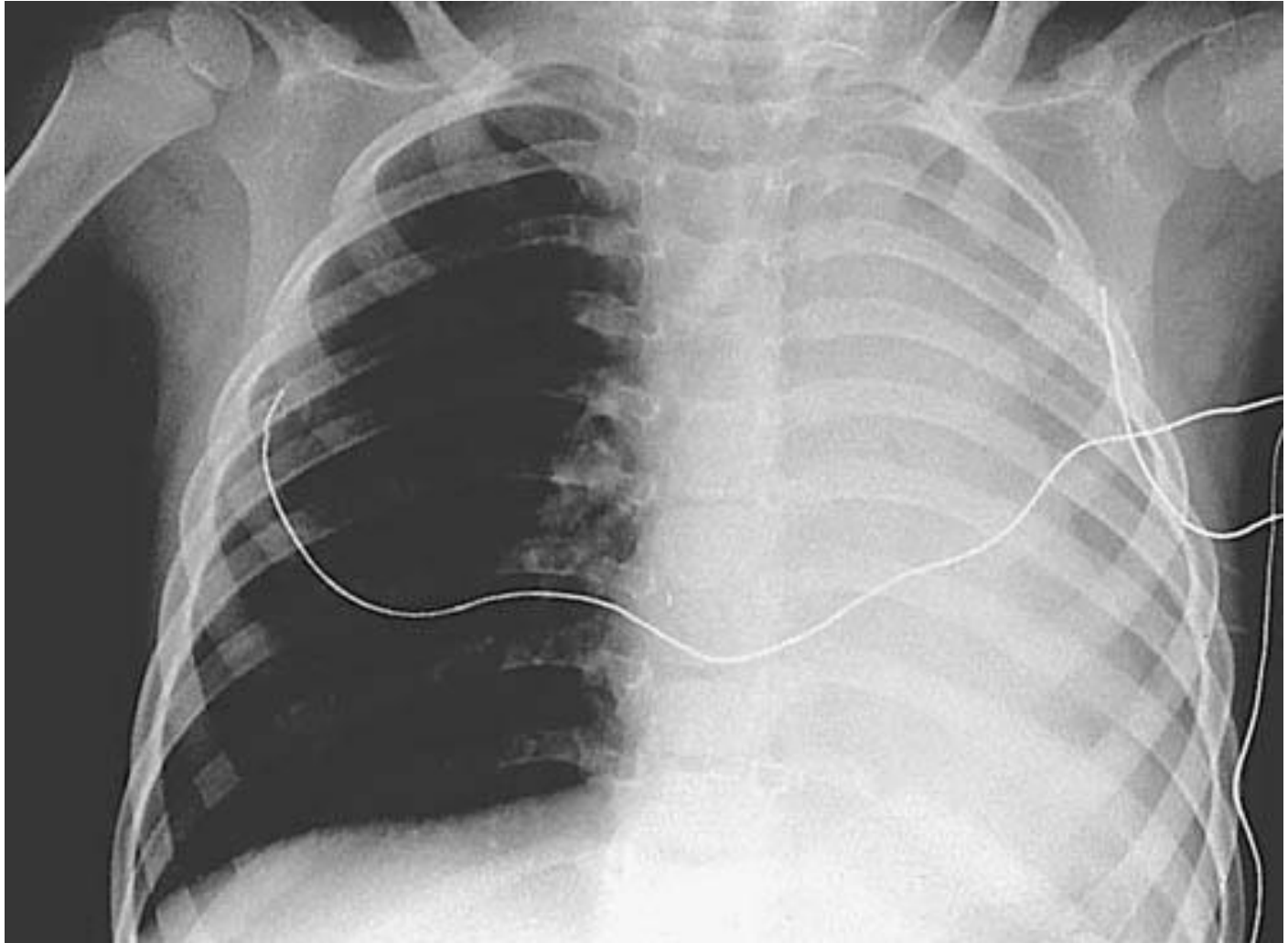
Foreign Body Aspiration



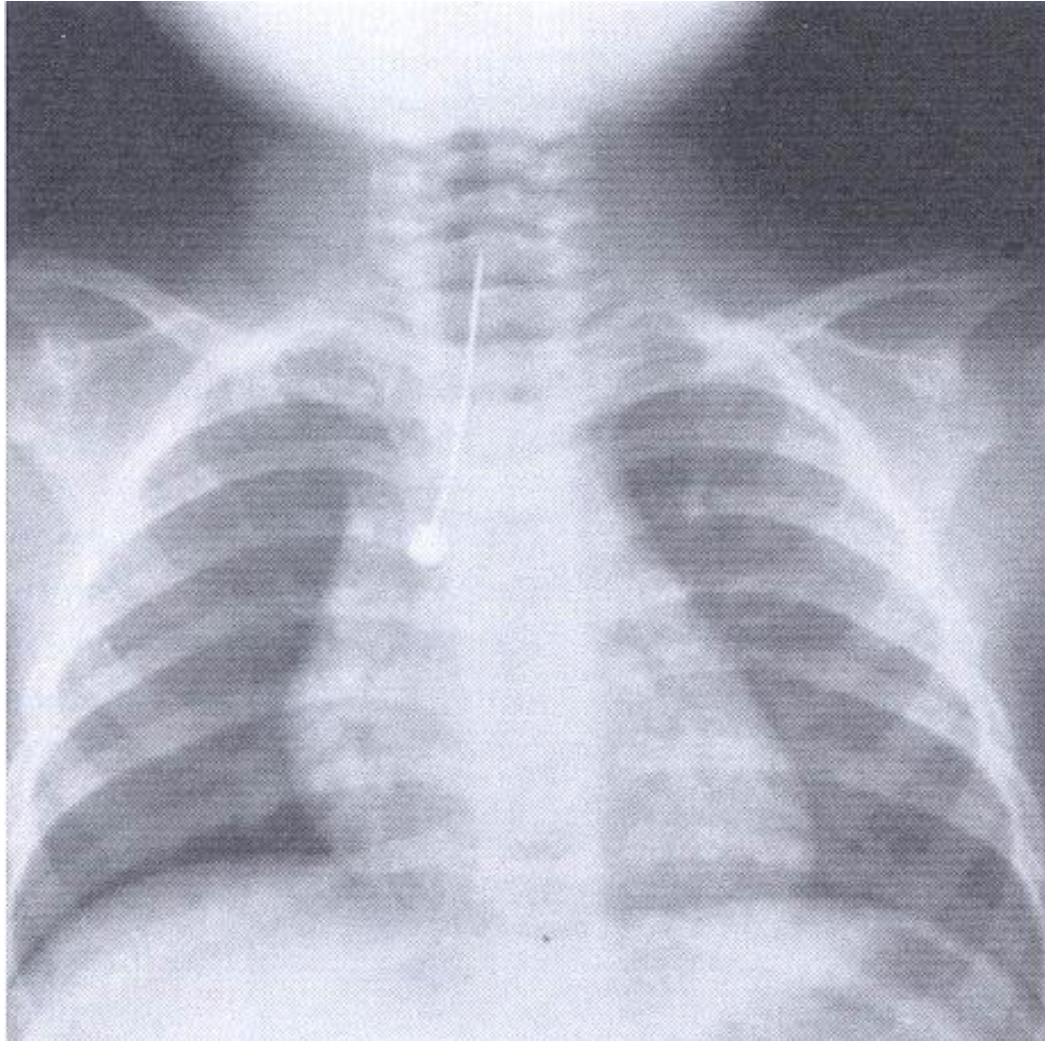
Foreign Body Aspiration



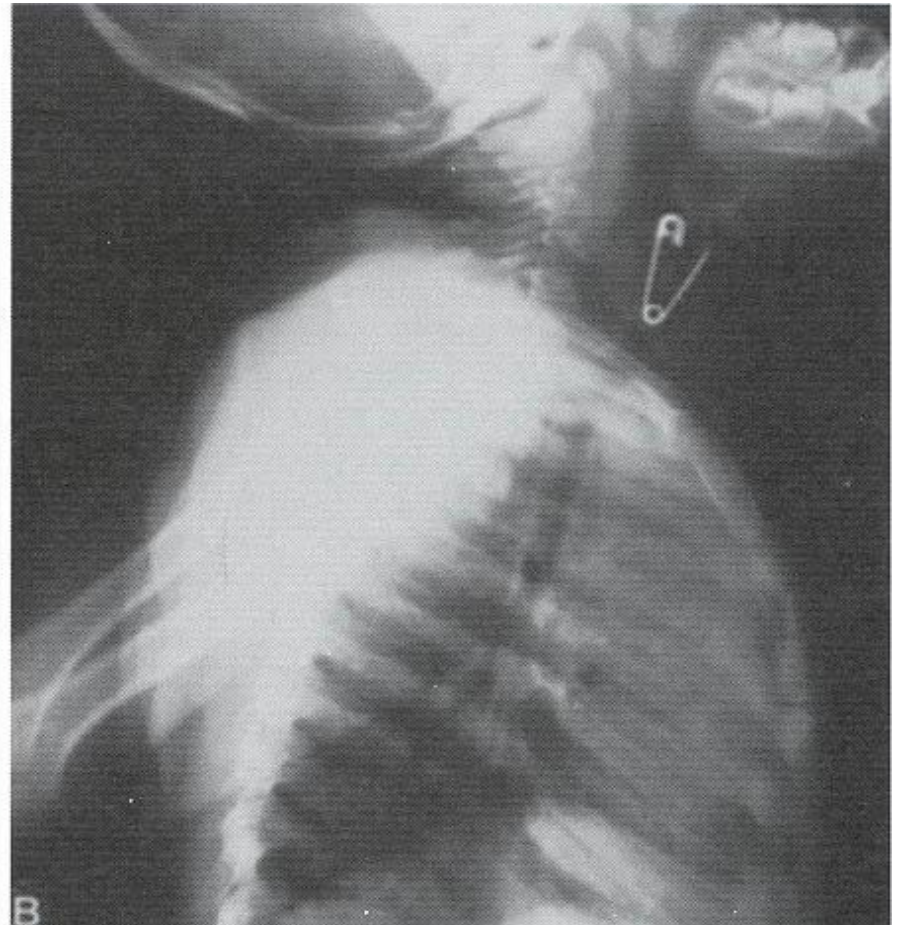
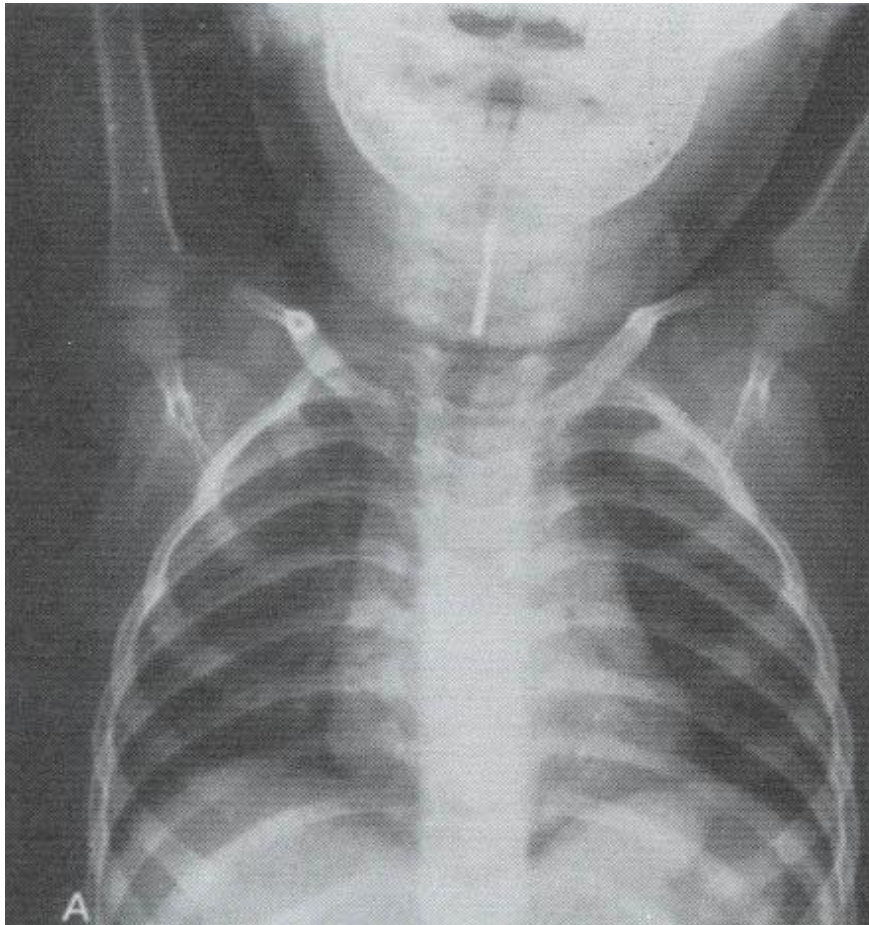
Foreign Body Aspiration

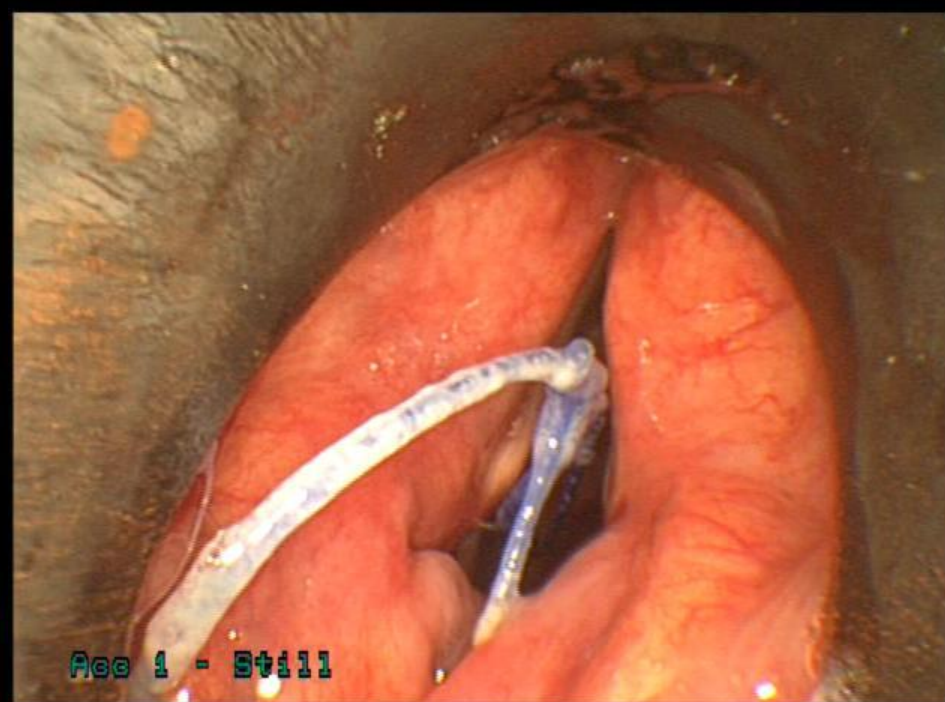


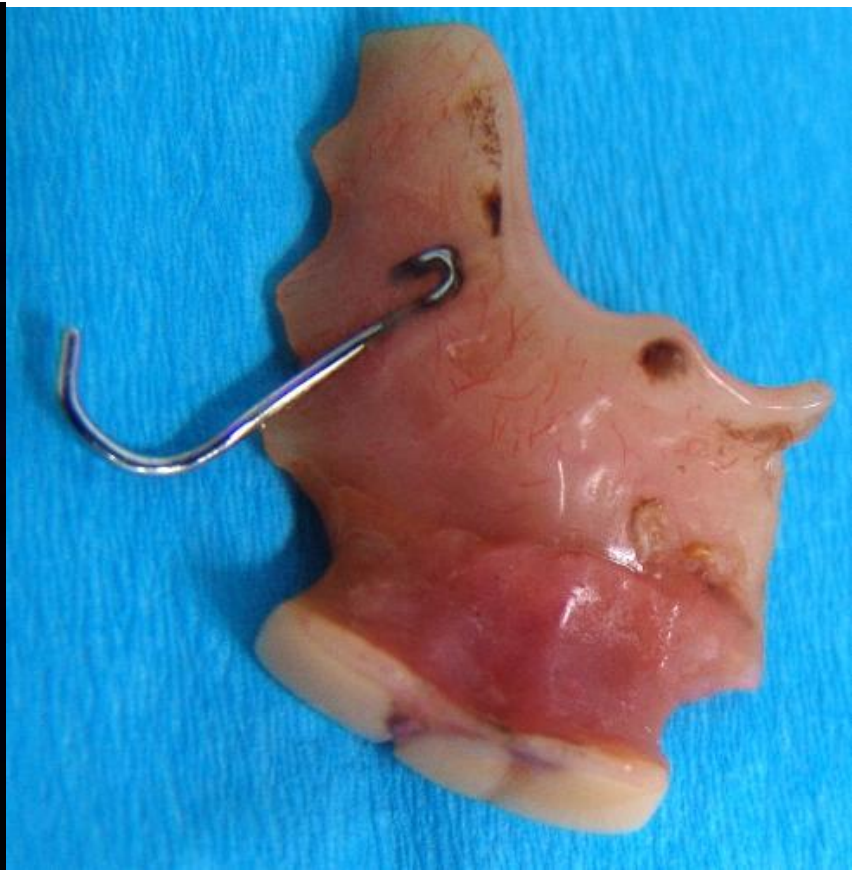
Foreign Body Aspiration

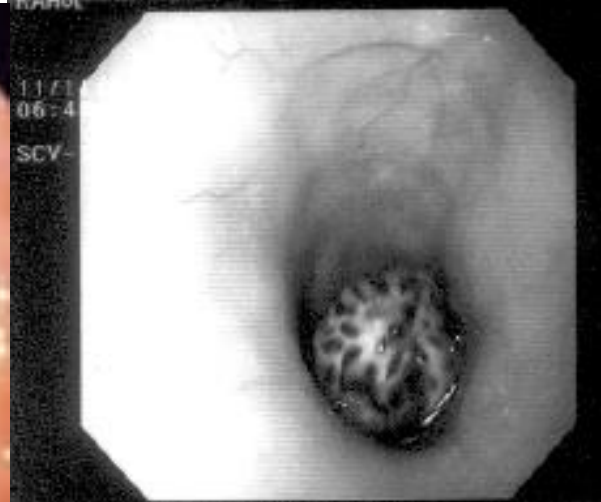
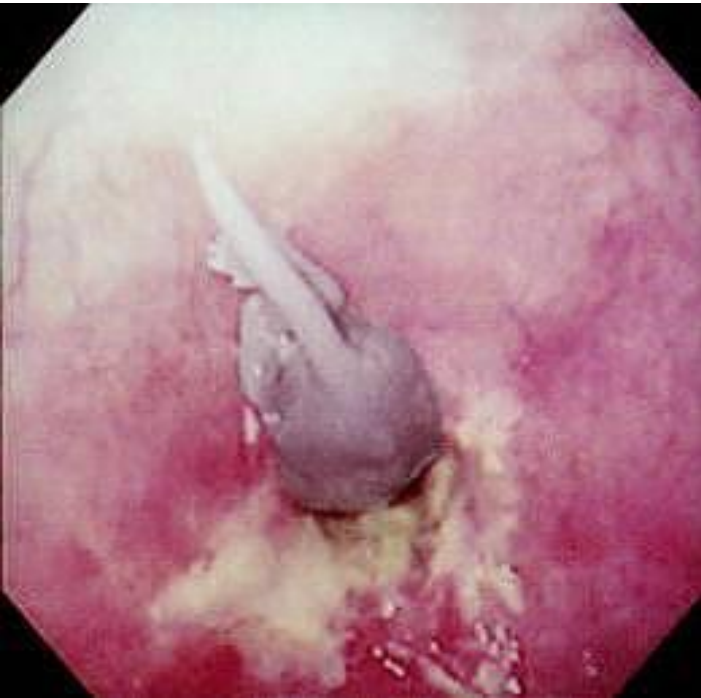


Foreign Body Aspiration







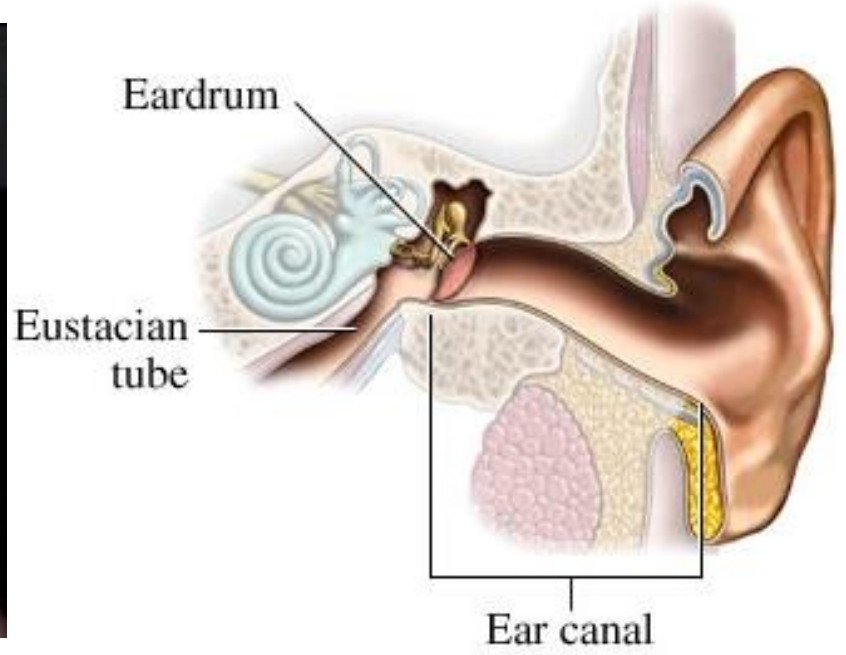


Foreign Body Aspiration

- Postoperative Care
 - Chest physiotherapy for retained secretions
 - Antibiotics
 - Not routinely used
 - Steroids
 - Not routinely used
 - Traumatic insertion or removal

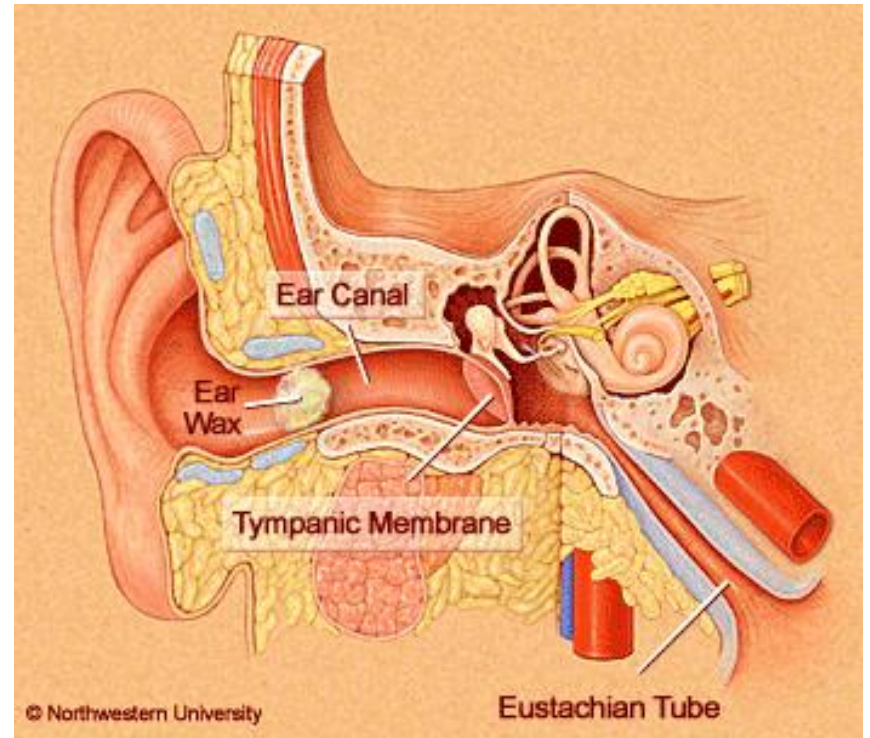
Foreign Body Aspiration

- Complications
 - Pneumonia
 - Antibiotics, physiotherapy
 - Atelectasis
 - Expectant management, physiotherapy
 - Pneumothorax
 - Pneumomediastinum





Swimmer's Ear (AOE)



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Eustachian Tube

Michael Saunders FRCS



Examine both ears





POLYPUS SNARES

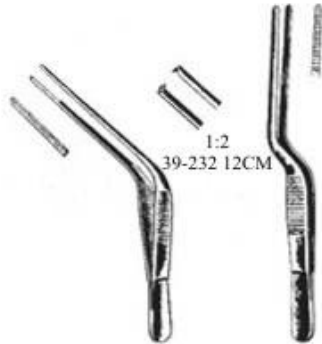


KRAUSE
39-210



LANGE WILDE
39-220

EAR DRESSING FORCEPS



TROELTSCH 39-230 12CM
LUCAE 39-240 14CM

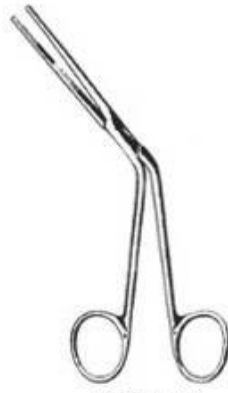
POLYPUS AND FOREIGN BODY FORCEPS



HARTMANN
39-260 12CM



HARTMANN
39-270 14CM



YANKAUER
39-280 15CM

EAR SPECULA



HARTMAN
39-100 SET OF 3
39-102 SET OF 4



TOYNBEE
39-110



GRUBER
39-120

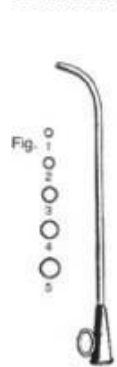


SIEGLE
39-130

- 39-140 50CC
- 39-142 75CC
- 39-144 100CC
- 39-146 150CC



CATHETERS PERFORATORS CURETTES



LUCAE
39-150
FIG 0 TO 5



WOAKES
39-160



TROELTSCH
39-172



GROSS
39-180 39-190



BARKER

What do you think?

- 3 y old
- Lt side discharge
- Foul smell

