Trauma and foreign in ENT

Objectives

•Discuss the presentation of patients with trauma to the nose, ear or the larynx and patients with ingested or inhaled FBs or with FBS in the nose or the ear.

•Discuss the management of those patient with emphasis on the emergency treatment.

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Reviewed by :

Correction File

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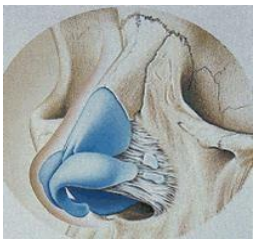
Nasal Trauma:



❖ Manifestations of nasal trauma:

- Fracture nasal bone either horizontal or longitudinal
- Septal injury

1- Displacement: Anterior displacement like in boxer it multiple septal fracture

2- Hematoma: Hematoma more than 3 day there will be risk of infection, cavernous sinus thrombosis, long term perforation so in ER patient with nasal fracture first check if there is hematoma and treated immediately if present

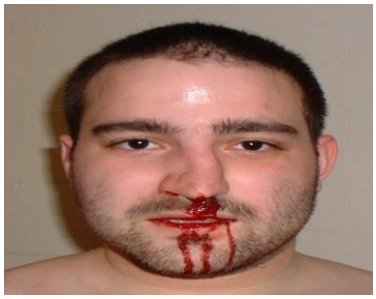
3- Perforation

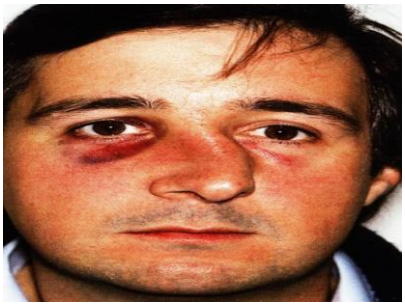
- Synechia
- CSF rhinorrhea = fracture of skull base
- Epistaxis

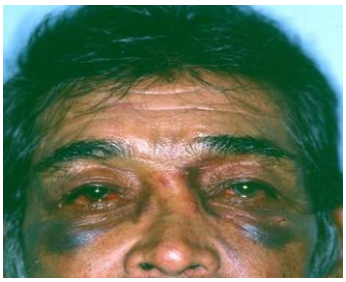
Note: The swelling and edema may interfere with proper evaluation. Therefore, re-examine for any deviation or fracture after 3-4 days for children and after one week in adults (children heal faster than adults).

1- Nasal Bone Fracture:

❖ Physical Examination



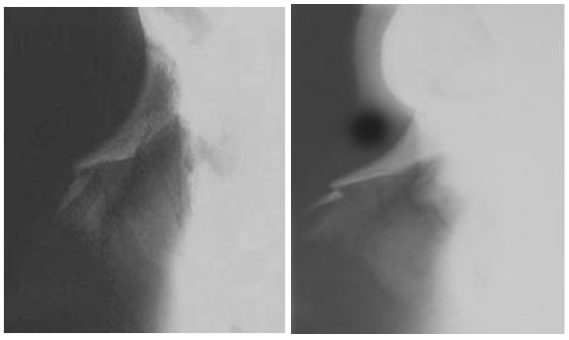


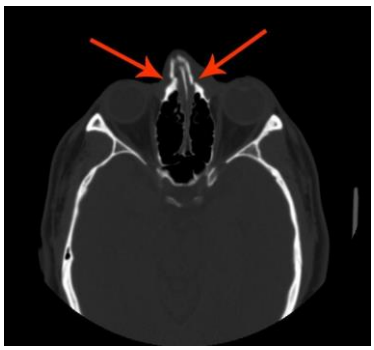


- patient present to you with nasal fracture, in the history important thing you have to ask about: when, how, epistaxis, nasal obstruction.
- In nasal obstruction, they have edema = it could be septal hematoma

Radiology :

- Usually **is not necessary** because treatment depends on the clinical findings
- In EXAM 30 years old with history of road traffic accident, the lateral x-ray show? Displacement nasal bone or nasal bone fracture the symptoms of this patient will be: epistaxis, nasal obstruction, rhinorrhea, external nasal deformity.



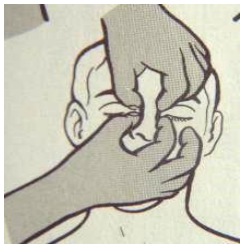
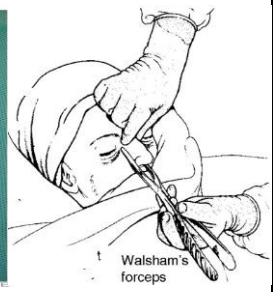
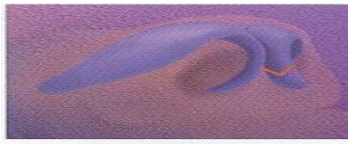
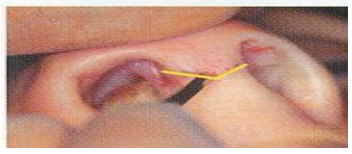
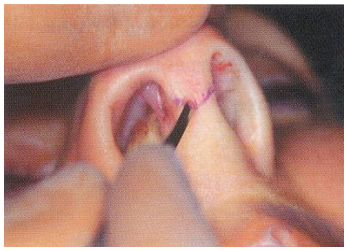
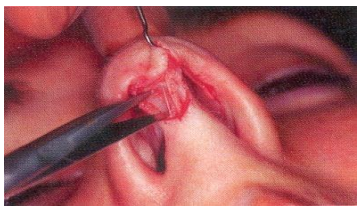


* Usually we do CT scan if we have multiple fracture
* This CT was token after rhinoplasty so there is multiple fracture but it is for cosmetic reason
* Nasal bone CT scan is helpful if the patient has associated facial fractures.

Management of fractured nasal bone:

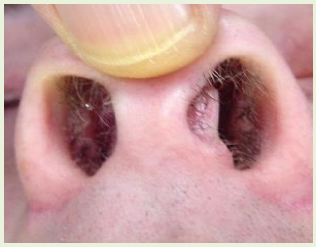
Depends upon the presence or the absence of nasal deformity (for proper assessment of the "shape" of the nose you may wait "few" days for the edema to subside)

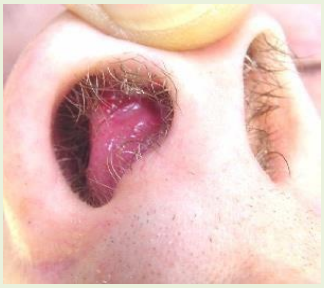
In Adult wait for edema resolve for 7-10 days

No deformity	deformity	
	Reduction	Rhinoplasty
No treatment	if presented early pediatrics within 10 days and adults up to two weeks.     External splint	if presented late to correct "old" fractures for children wait until the age of 18.    

2- Nasal Septum Injury:

Displacement of nasal septum





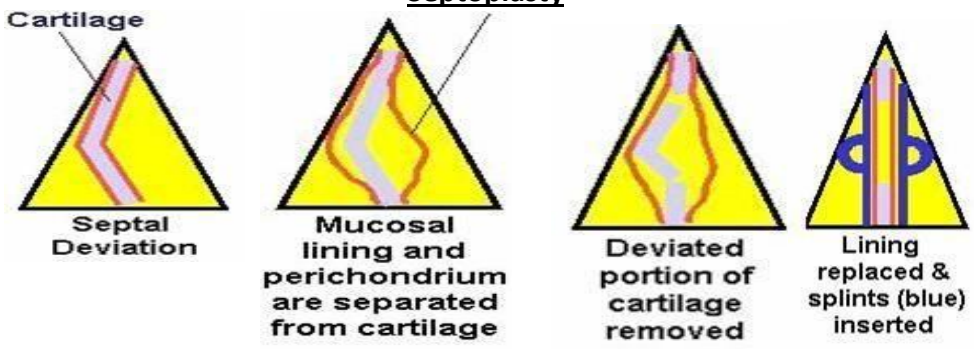
Presentation: When the caudal edge of the nasal septum is displaced.

1- May be asymptomatic
2- Nasal obstruction
3- Cosmetic deformity

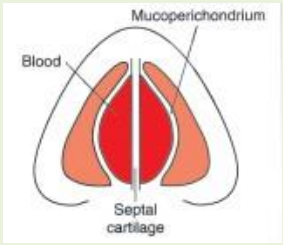
Treatment of displacement of nasal septum:

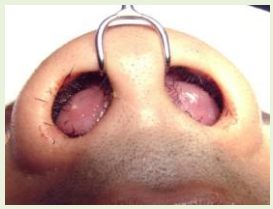
1- No symptoms: no treatment
2- Symptomatic:
–Early presentation: Reposition
–Late presentation: Septoplasty

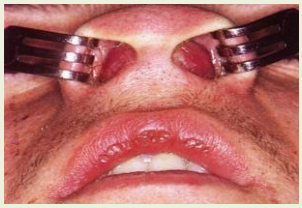
Septoplasty



Septal hematoma

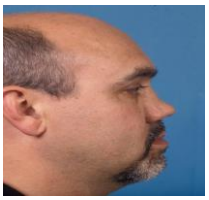






Patient present with nasal trauma 1 week before, on nasal l examination nasal obstruction was found, so:
1- what is the diagnosis?? Septal hematoma
2- what is the Complication?? Cavernous sinus thrombosis, septal perforation, saddle nose

- What is the cause? septal surgery, nasal surgery most common, nasal trauma.
- The perichondrium is responsible for supplying the cartilage, so during surgery the mucosa will be separated from the cartilage, which will cause necrosis and eventually deformity.



- Complications of Septal hematoma:

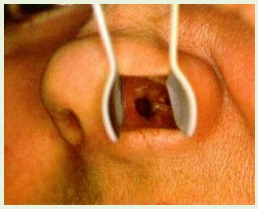
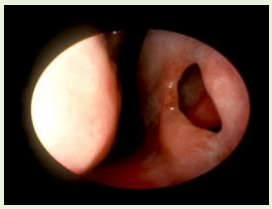
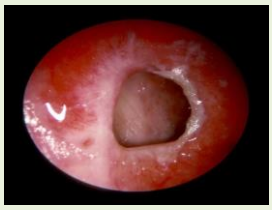
1- Necrosis of the cartilage: Deformity
2- Infection: Septal abscess, Spread to the intracranial

- Diagnosis (MedScape):

A careful examination is important for anyone who sustains nasal trauma. Signs of external trauma, such as nasal deformity, epistaxis, or significant pain, are associated with a septal hematoma. However, a septal hematoma may be present without any signs of external trauma. A septal hematoma can usually be diagnosed by inspecting the septum with a nasal speculum or an otoscope. Asymmetry of the septum with a bluish or reddish fluctuance may suggest a hematoma. Direct palpation may also be necessary, as newly formed hematomas may not be ecchymotic.

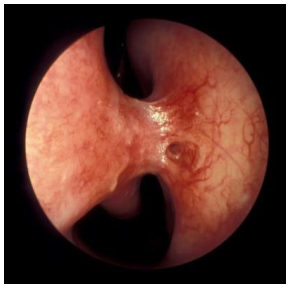
- Treatment of septal hematoma:

Immediate incision & drainage

Traumatic septal perforation:   	• Seen in drug abuse, cocaine • Mostly due to surgical trauma • May be due to self-inflicted trauma • Symptoms: 1- No symptoms 2- Whistling sound during breathing 3- Crusting and epistaxis Can lead to nasal obstruction • Treatment: 1- No treatment 2- Nasal wash 3- Surgical repair 4- Insertion of silicon "button"

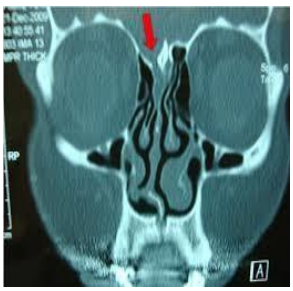
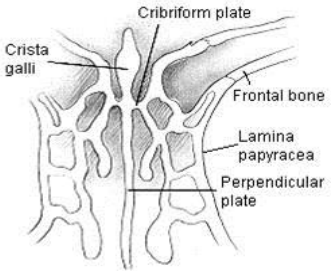
3- Synechia:

- Usually follow surgery
- May be asymptomatic
- May cause nasal obstruction
- If symptomatic, treatment is by division and insertion of silastic sheets (for 10 days)



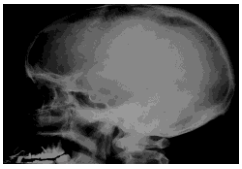

4- CSF Rhinorrhea

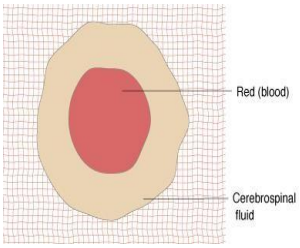
- Due to injury of the roof of the nose and the dura
- unilateral watery rhinorrhea increases by bending forward, exertion and coughing
- Halo sign (a sign seen on the pillow where the person with CSF rhinorrhea was sleeping).
- Diagnosis is confirmed by biochemical analysis (Beta-2-transferrin) and by radiology
- Most cases resolve with conservative treatment
- Surgical repair may be needed in minority of cases

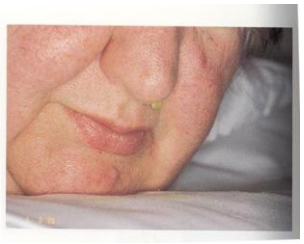



Complications of CSF Rhinorrhea :

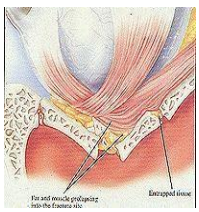
1- Meningitis
2- Tension pneumocephalus

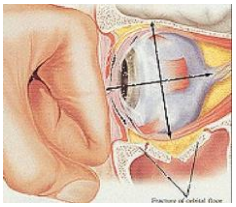






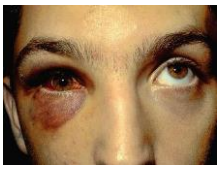
5- Sinus Trauma





❖ Blow-out fracture:

- Injury of the orbital floor (maxillary sinus roof) due to blunt trauma to the orbit
- Etiology: - Pure orbital floor fractures result from an impact injury to the globe and upper eyelid. 2- The object is usually small enough to not fracture the orbital rim but large enough not to perforate the globe.
- (picture) In exam: history of RTA (road traffic accident):



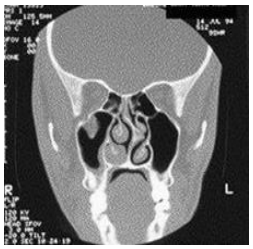
1- diagnosis: Blow-out fracture

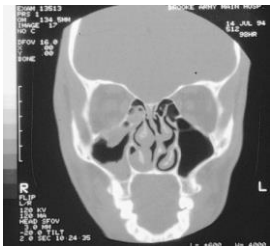
2- give 2 symptoms:

- Physical examination

1- Enophthalmos (posterior displacement of the eyeball within the orbit).
2- subconjunctival hge
3- Diplopia and restriction of upward gaze
4- Injury to optic nerve so cannot move eye up
5- Decreased visual acuity.
6- . Blepharoptosis: drooping or abnormal relaxation of the upper eyelid.
7- Patients may complain of epistaxis.
8- The globe can be ruptured.
9- subconjunctival hemorrhage

- Radiology: Tear-drop sign





- Treatment: Repair Ask the patient to come. After 1 week to asset (wait to edema resolve)

➢ Nasal Foreign Bodies:

✓ Clinical presentation:

1- May be asymptomatic
2- Unilateral nasal obstruction
3- Bad odor blood stained unilateral nasal Discharge most important symptoms

✓ Most common seen in pediatric

✓ The most common site is between the inferior turbinate and the nasal septum.

✓ If the foreign body stays in the nose for a long time it will cause perforation. or Chemical burn of the skin around the nose– especially with leakage from 'button batteries'.

✓ You do flexible endoscope

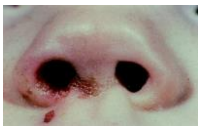
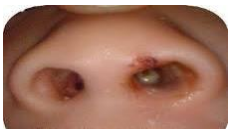
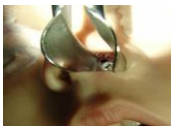
✓ treated as soon as possible before foreign body go to bronchus and baby die

✓ examination:

Exam question: 5 years old present with nasal discharge

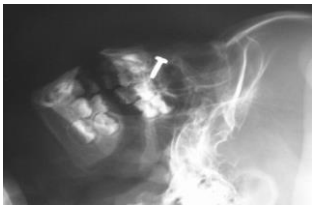
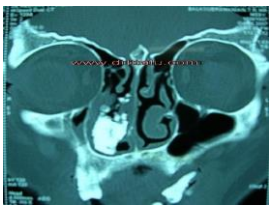
What is the complication??

septal perforation, foreign body obstruct the bronchus

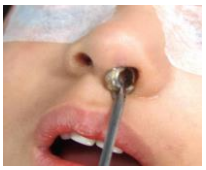
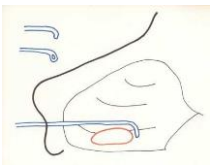




✓ Radiology:

Rhinolith, it come with adult, you see it as mass in image

✓ Treatment:

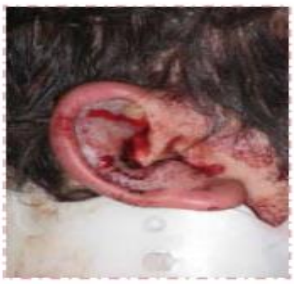
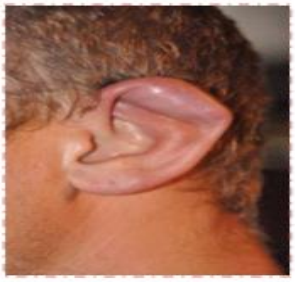



- Removal (general anesthesia may be needed)
- Disc batteries removal is an emergency because of
- sever necrosis due to release of NaOH, KOH, & mercury
- The most important thing is to secure the airway.
- If the foreign body is located anteriorly and the child is cooperative we can remove it by forceps in the clinic.
- If it is positioned posteriorly, at the level of the nasopharynx; or if the child is struggling or uncooperative the foreign body could be pushed further back when attempting to remove it and might lead to further complications such as: foreign body inhalation or reaching the lungs. In these cases, take the patient to the O.R and remove it under G.A.

Ear Trauma

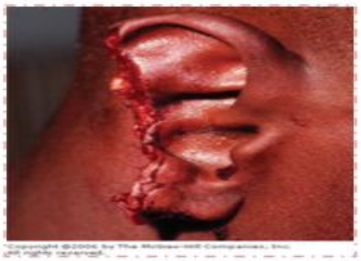
From 433 :

**EXTERNAL EAR:
(Auricle injuries)

1- Hematoma
Cartilage injuries in general cause hematoma.
Very common, we see 2-3 cases per week.
The child fell, adults were in a fight, ear got hit.
Why hematoma is different in ear than in thigh?
Cartilage.
Cartilage in general does not have blood vessels; therefore it takes its nutrition either from periosteum (Bone) or perichondrium (CT). If there hematoma then the cartilage will get separated from these structure and will not get nutrition.
If left untreated → Necrosis of the cartilage → permanent deformity (Cauliflower deformity)
Therefore it needs to be diagnosed early.

Treatment: Drain it & apply pressure dressing (To reattach it together with the periosteum). Excise fibrous tissue. incision and drainage + AB



2-Avulsion:
Ear or part of ear is cut off.
If patient presents within 3-4 hours to the ER we can re-implant it and re-vascularize it. microvascular anastomosis
If the patient presents late the surgeon can install a plastic ear.

3-Laceration:
From glass, knives, bite injuries
Treatment: Sutures

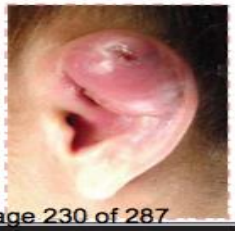
4-Cancer:
Ear is affected by cancer SCC (Squamous cell carcinoma) or BCC (Bassal cell carcinoma)

5-Frostbite:
In cold countries the cartilage gets necrosis.

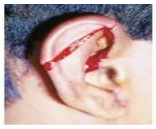
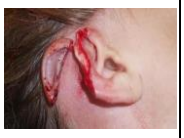
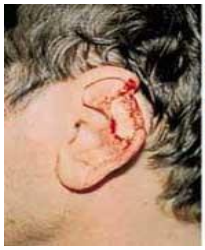
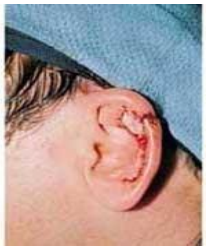
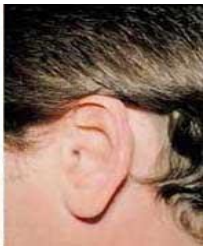
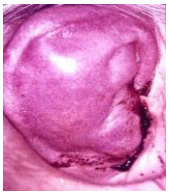
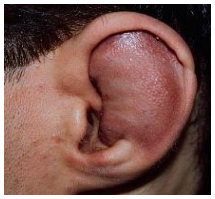
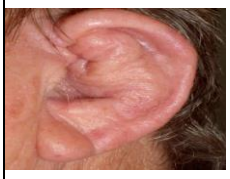
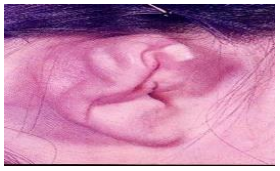
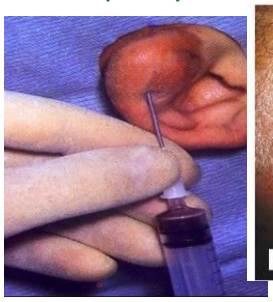
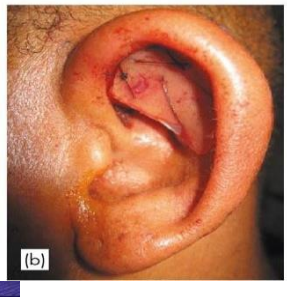
6-Burns

7-Split or Cauliflower Injuries From Ear Piercings or Earrings.
-The lobule (where our ear pierced by our parents) is made of soft tissue and has no cartilage. It can get split in half.(if earring was pulled)
Treatment: Suture it in the clinic.

-If the piercing is higher in the ear, in the cartilage it can get infected, Cause a deformity, hematoma, abscess and even keloid in dark skinned people. non sterile can be Risk factor for keloid
Treatment: Drain if abscess or hematoma.
Local steroids is the treatment for Keloid as it returns if removed

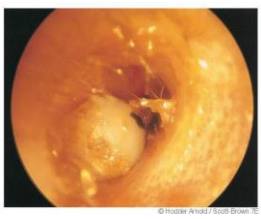
➢ Trauma to the Auricle:

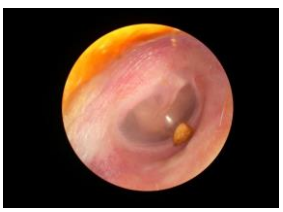
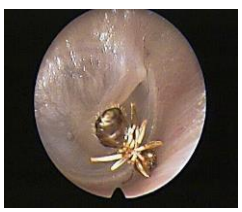
Laceration	Hematoma auris
     	➢ Seen in BOXER   ➢ Complication: Cauliflower ear   ➢ Treatment: 1- Drain 2- Antibiotic >> you can use fucoid ointment (powerful treatment) 3- Compress 4- Otoplasty  

Foreign body external ear

➢ Presentation:

1- No symptoms
2- Earache
3- Deafness

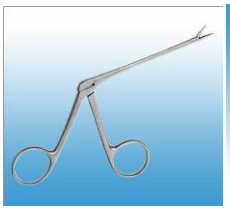
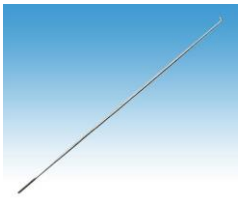


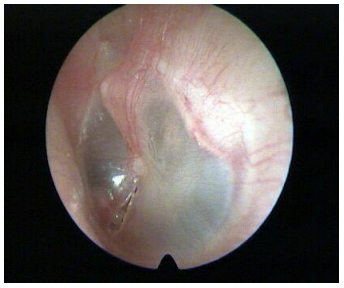
➢ Remove foreign body:

1- Full cooperation from the patient; otherwise go to general anesthesia, in children general anesthesia is better to reduce risk of perforate TM
2- Disc batteries are emergency
3- Live insects to be killed or float out
4- Removal by: syringing and/or by instrumentation



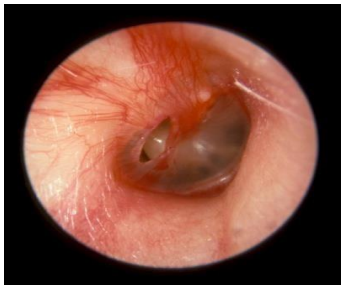

Traumatic TM Perforation



➢ **Presentation**

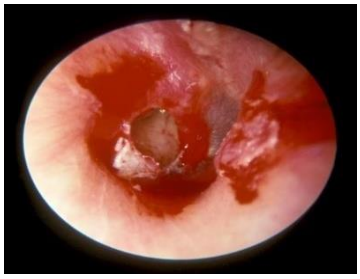
- History of trauma
- Earache
- Deafness
- Bloody otorhea

➢ Treatment of traumatic TM perforation:



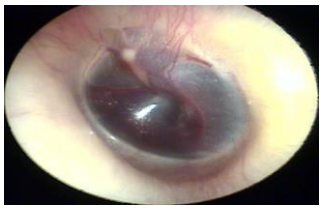
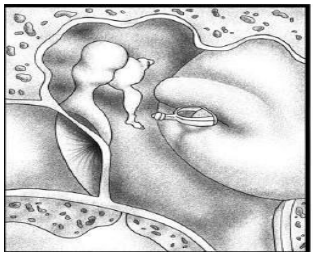
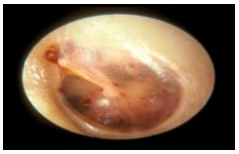
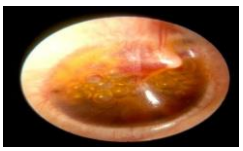
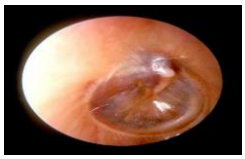
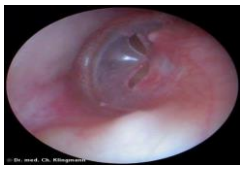
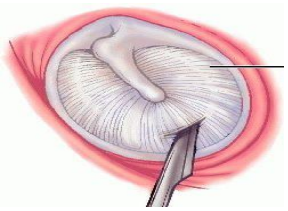
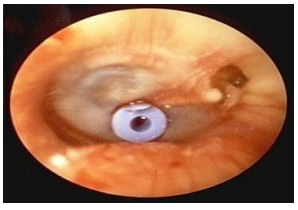
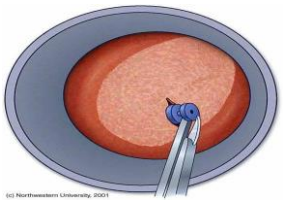
•Observation
  –Most cases heel spontaneously
  –No suction, no drops & no water

•Elective myringoplasty Elective: myringoplasty is not a good choice in trauma, it is done after 3 months



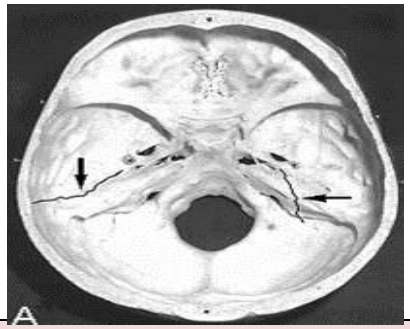
➢ TM Perforation with blood the cause is trauma, keep the ear dry to prevent infection, and it can heal within 3 months without the treatment, give ofloxacin ear drops which is safe not auto toxic, avoid gentamicin ear drops with perforated TM because it auto toxic and Couse hearing loss

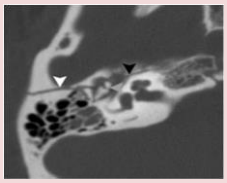
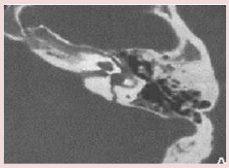
Middle ear trauma

Hemotympanum 	➢ Usually is asymptomatic ➢ May cause conductive hearing loss ➢ Treated by observation because most cases resolve spontaneously ➢ Good for Exam Q ➢ Hemotympanum = temporal bone fracture, skull base fracture ➢ It is either horizontal or vertical
Traumatic Ossicular disruption 	➢ Suspected if trauma followed by CHL with intact TM ➢ Diagnosis is confirmed by CT and/or by surgical exploration (tympanotomy) ➢ Treatment is by surgical repair
Otitic barotrauma    	➢ Pathological conditions of the ear induced by pressure changes. Middle ear otitic barotrauma results from failure of the Eustachian tube to equalize an increasing atmospheric pressure, Pressure changes = like in diving or in airplane ➢ Occurs most commonly during descent from high altitudes in aircraft or during descent in underwater diving ➢ Pathology: the negative middle ear pressures causes transudate in the middle ear, rupture of superficial vessels, retraction of TM, and may cause perforation ➢ Symptoms: discomfort, pain & deafness. ➢ Treatment: 1- Prophylactic 2- Decongestant, analgesic and auto inflation (Valsalva maneuver) you can give the patient utrophin drop to open the nose (Eustachian tube)  3- Myringotomy ± VT insertion Vt = ventilation tube   

Temporal bone fractures

IMPORTANT

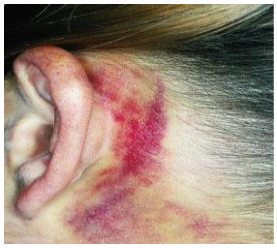


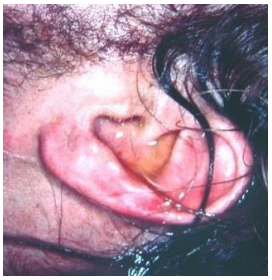
Longitudinal	Transverse
	
➢ 70% ➢ Conductive hearing loss (rupture drum, hemotympanum or ossicular disruption) ➢ Facial nerve paresis is not ➢ Common	➢ 20% ➢ SNHL & vertigo (Labyrinthine injury) ➢ Facial nerve paralysis is common

- In written exam >> most common cause of Fracture temporal bone?? Longitudinal
- Longitudinal = conductive hearing loss, temporoparietal, cochlea is intact
- Transverse = occipitofrontal, risk to injured cochlea, so sensory hearing loss
- Mixed: 10% of the cases worst prognosis
- Diagnosis: The golden standard is High Resolution CT

Manifestations

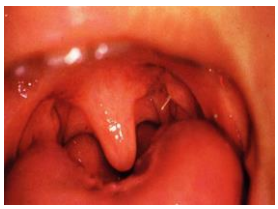
- Battle sign (Q = RTA with facial palsy)

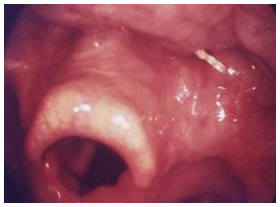




- TM perforation
- Hemotympanum
- CSF otorrhea or rhinorrhea
- Ossicular disruption
- SNHL
- Vertigo
- Facial nerve paralysis

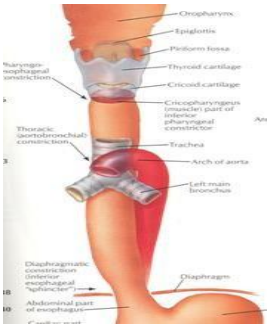
Foreign body of pharynx





- Usually sharp FB
- Fish bone is the most common
- Common sites: tonsils, base of tongue and vallecula
- Diagnosis is by physical examination
- Treatment is by removal
- Emergency, need admission
- Present with: respiratory distress
- Fish bone most present cases might also be Dentures or vegetable matter

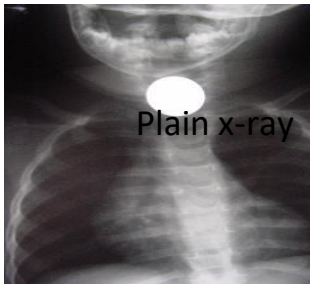
Foreign body of esophagus

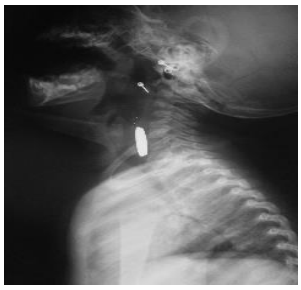


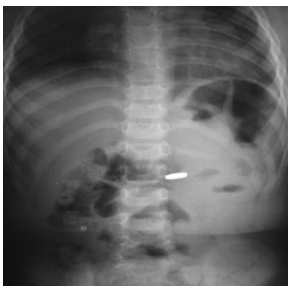
- Coins – 75%
- Meat, dentures, disc batteries etc.
- Common locations

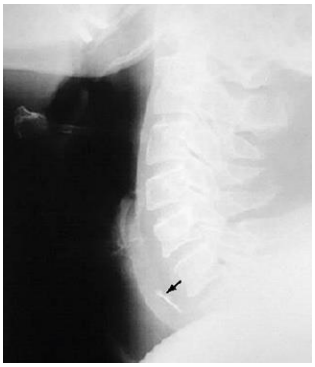
1- Cricopharyngeus
2- Aorta/left main stem bronchus
3- Gastroesophageal junction

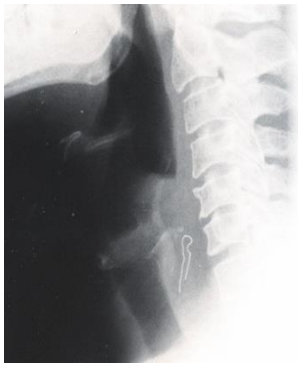
- Symptoms
  Choking, coughing, dysphagia, odynophagia
- Physical exam
  Drooling, refuses oral intake
- Radiology

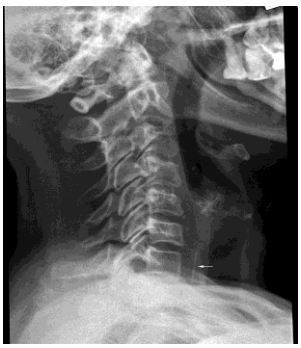


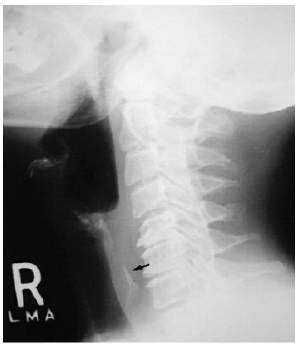




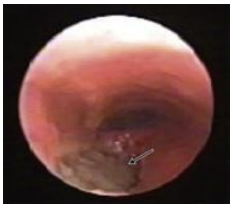








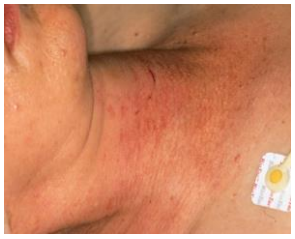
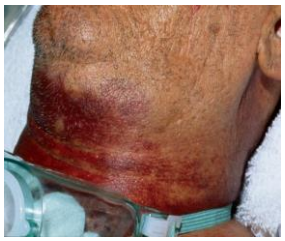
- Esophogoscopy
- Treatment:
  - Removal via esophagoscopy
  - Disc batteries and sharp objects removal is an emergency because of the risk of perforation



From 433: All pharyngeal foreign bodies are medical emergencies that require airway protection.

1- Complete airway obstruction usually occurs at the time of aspiration and results in immediate respiratory distress, emergency intervention is essential. Common obstructing foreign bodies in children include balloons, pieces of soft deformable plastic, and food boluses.
2- Patients with non-obstructing or partially obstructing foreign bodies in the throat often present with a history of choking, dysphagia, odynophagia, or dysphonia. Pharyngeal foreign bodies should also be suspected in patients with undiagnosed coughing, stridor, or hoarseness.
3- Parents and caregivers of children with symptoms of partial airway obstruction should be asked whether choking and aspiration have occurred. Diagnosis is often complicated by delayed presentation. Case reports describe foreign bodies in the throat that were misdiagnosed and treated as croup. Thus, physicians must have a high degree of suspicion in patients with unexplained upper airway symptoms, especially in children who have a history of choking.

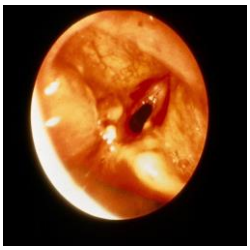
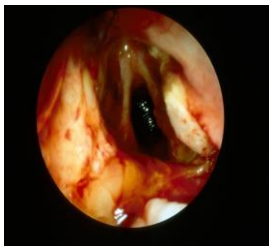
Laryngeal Trauma

- Presentation:

1- Stridor
2- Hoarseness
3- Subcutaneous emphysema
4- Hemoptysis
5- Laryngeal tenderness, swelling and edema

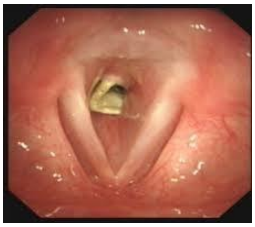
- Laryngoscope Exam:

- Treatment:

1- Tracheostomy if there is respiratory distress or
2- bleeding
3- Explore and repair

Foreign bodies of the larynx



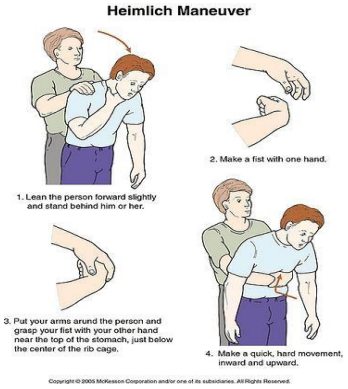
- Presentation:

1- Dyspnea
2- Cough
3- Hoarseness or aphonia

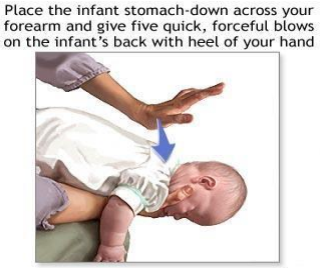
- Always suspect the sudden onset of stridor in a previously healthy child is due to a foreign body until proven otherwise.
- Dangerous if the foreign body is big.

Treatment:

1- Heimlich Maneuver

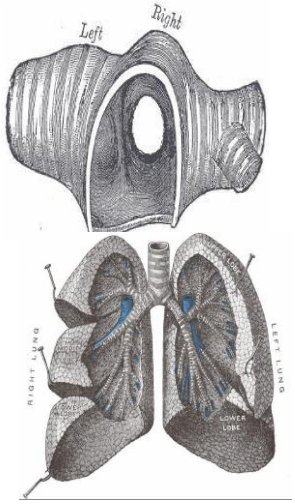


2- Slapping the back with the patient's head down



3- Manual removal
4- Removal by laryngoscopy
5- Tracheostomy or laryngostomy (cricothyrotomy)

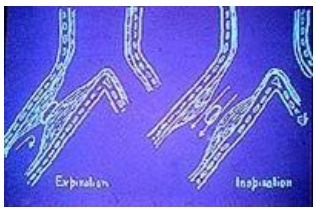
Foreign bodies in the tracheobronchial tree



- Usually in infants and children
- Most FB's are organic material (mostly food derivatives)
- Location: Mostly in the right side (60%)
- History:

1- Parental suspicion in pediatrics
2- Choking
3- Gagging
4- Wheezing: if prolonged in the chest, might be mistaken with bronchial asthma.
5- Hoarseness
6- Dysphonia.
7- Pneumonia, foreign body can lead to infection.
8- A positive history must never be ignored, while a negative history may be misleading.
9- Note: The commonest site of ingestion injury is in the cricopharyngeal fossa because the cricopharyngeal sphincter has a protective role. Ingestion injury is common among neurological disease affecting swallowing. It is not serious unless the object is very large.

CLINICAL PRESENTATION	
laryngeal reflexes	Choking, cough, gagging & cyanosis
fatigue of cough reflex	Asymptomatic phase
emphysema, atelectasis or infection	Wheeze, intractable cough, persistent or recurrent chest infection.



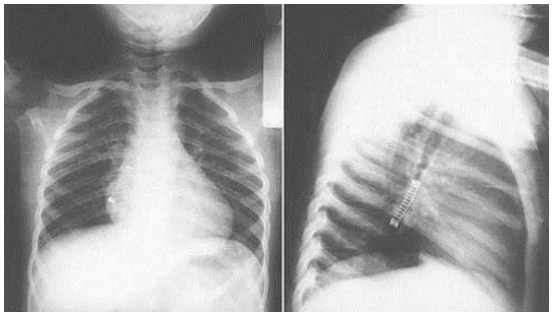
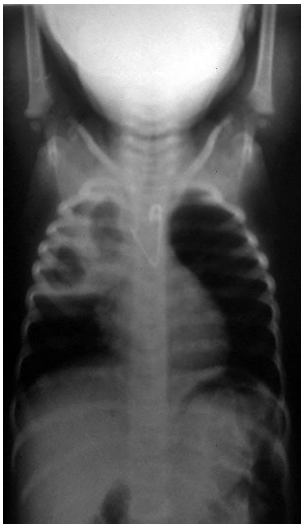
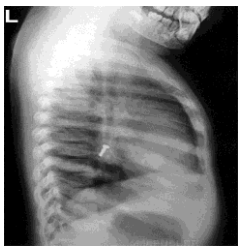
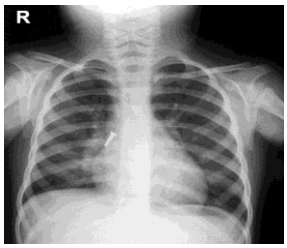
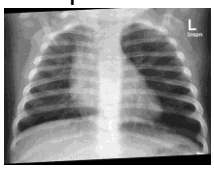
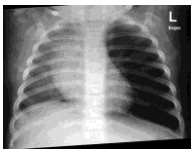
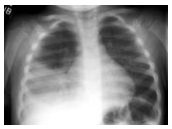
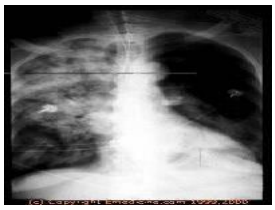
➢ Physical exam and investigations:

• Larynx/cervical trachea: Inspiratory or biphasic stridor.
• Intrathoracic trachea: Prolonged expiratory wheeze.
• Bronchi: Unequal breath sounds.
• Location: Mostly in the right side (60%)
• Diagnostic triad - <50%
1. Unilateral wheeze 2. Cough 3. Ipsilaterally diminished breath sounds.
• Assess nares/choanae.
• Assess adnoid and lingual tonsil.
• Assess TVC mobility.
• Assess laryngeal structures.

➢ Investigations:

• Fiberoptic laryngoscopy (golden standard)
• Bronchoscopy if laryngoscopy is not available.
• Proper equipment.
• Plain films: Not all foreign bodies are radio-opaque therefore will not be visualized. In these cases, we go by the history even in the absence of +ve radiographs. Radiolucent bodies such as food like popcorn or vegetables
o Chest and airway AP and lat.
o Expiratory films.
• Fluoroscopy if foreign body stayed for long and you are suspecting an injury.
• Barium swallows.
• CT, MRI, Angiopraphy.

Note: inhalation injury is more serious than ingestion, but ingestion is more common.

<table>
<tr><th colspan="4">Radiology of tracheobronchial F.Bs</th></tr>
<tr><td>Radio-opaque FB</td><td colspan="3">     </td></tr>
<tr><td>Emphysema</td><td colspan="3">Inspiration  Expiration  </td></tr>
<tr><td>Collapse</td><td>  </td><td>Bronchopneumonia</td><td>  </td></tr>
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- Treatment: To be initiated on clinical suspicion

1- Bronchoscopy: in most cases
2- Bronchotomy
3- Pulmonary resection