



433 Teams
ENT

24 & 25

Trauma and Foreign body I & II

Color index:

432 Team – **Important** – 433 Notes – Not important

ent433team@gmail.com



جامعة
الملك سعود
King Saud University



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.

Trauma:

Nasal Trauma:

Causes:

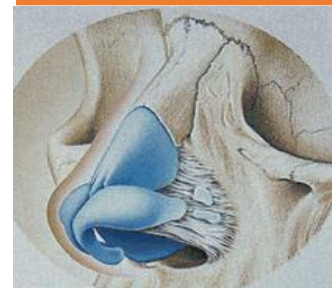
1. Traumatic most commonly.
2. Iatrogenic (surgical).
3. Foreign bodies: If it stayed for long time, it will lead to necrosis of the cartilage.

Manifestations of Nasal Trauma:

- **Fracture** of the Nasal Bone
- **Septal injury:** (Displacement, Hematoma, Perforation)
- **Synechia**
- **CSF Rhinorrhea**
- **Epistaxis**

Nasal Trauma:

- The bones of the nose are the most frequently broken bones in the face as they are the most prominent. A nose break will affect the patient's appearance. There will probably be deviation, distortion and swelling over the nasal bridge.
- Immediate evaluation is necessary to **make sure there is no septal hematoma** (blood between the septum and cartilage).
- If septal hematoma develops (it should be drained), it might be complicated by an infection, and 5 days later it might progress to an abscess. This may lead to **cartilage necrosis and the patient might end up with a saddle nose** deformity because of supportive cartilage loss.
- 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).
- Do a nasal bone reduction if patient presents early: pediatrics within 10 days and adults up to two weeks. However, if the bone has healed alone, or it's a complicated fracture, or there is a hematoma: **septorhinoplasty** needs to be done. For children wait until the age of 18.



Diagnosis of Nasal Fractures: "MedScape" Doctor's notes in red

- **Most nasal fractures are diagnosed by history and physical examination.**
- History usually includes a preexisting trauma, which may be followed by epistaxis. Typically, the epistaxis has resolved by the time the patient presents for intervention.
- **Patients usually present with swelling over the nasal bridge** and a difference in the appearance or shape of the nose.
- Physical examination findings include swelling over the nasal bridge, grossly apparent deviation of the nasal bones, and periorbital ecchymosis.
- **Plain radiographs are not helpful in the diagnosis or management** of nasal fractures in isolated nasal injury.
- **Nasal bone CT scan is helpful** if the patient has associated facial fractures.
- Be sure to ask the patient how the external shape of the nose has changed since the fracture. This helps determine what corrective maneuvers should be taken to restore the patient's appearance through reduction of the nasal fracture.

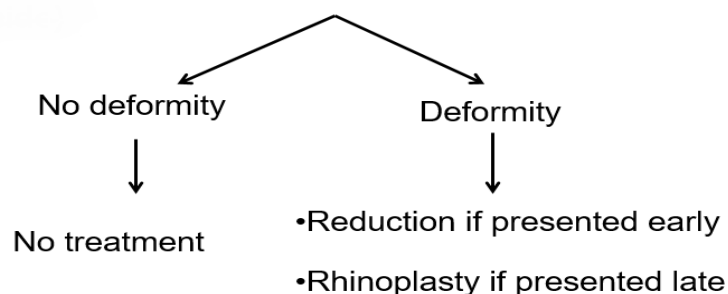
Management:

- 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)



Repair time is limited

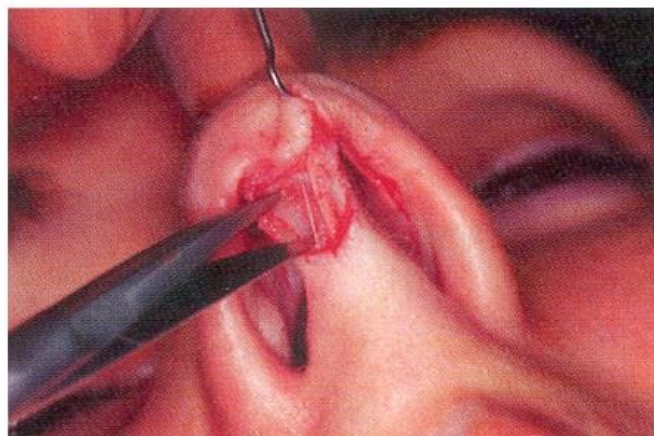
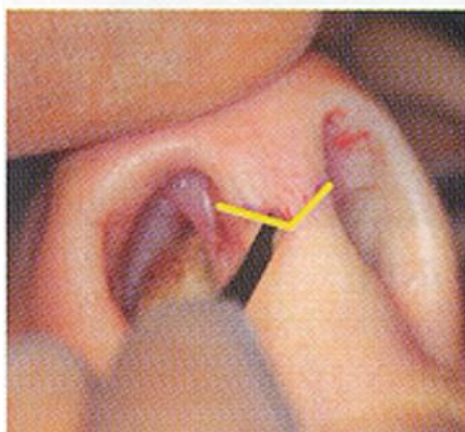
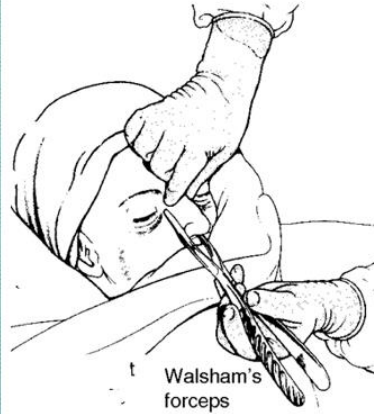
Nasal bone reduction:
 Pediatrics: within 10 days,
 Adults: Up to Two Weeks If
 more than that will need to
 do a septorhinoplasty.



Reduction



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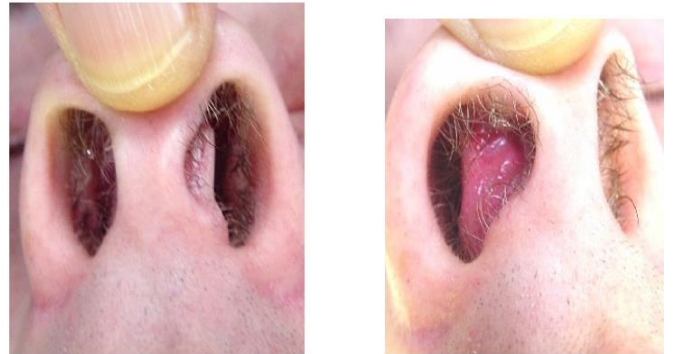


Nasal Septum Injuries:

Displacement of nasal septum

Presentation of Displaced NS:

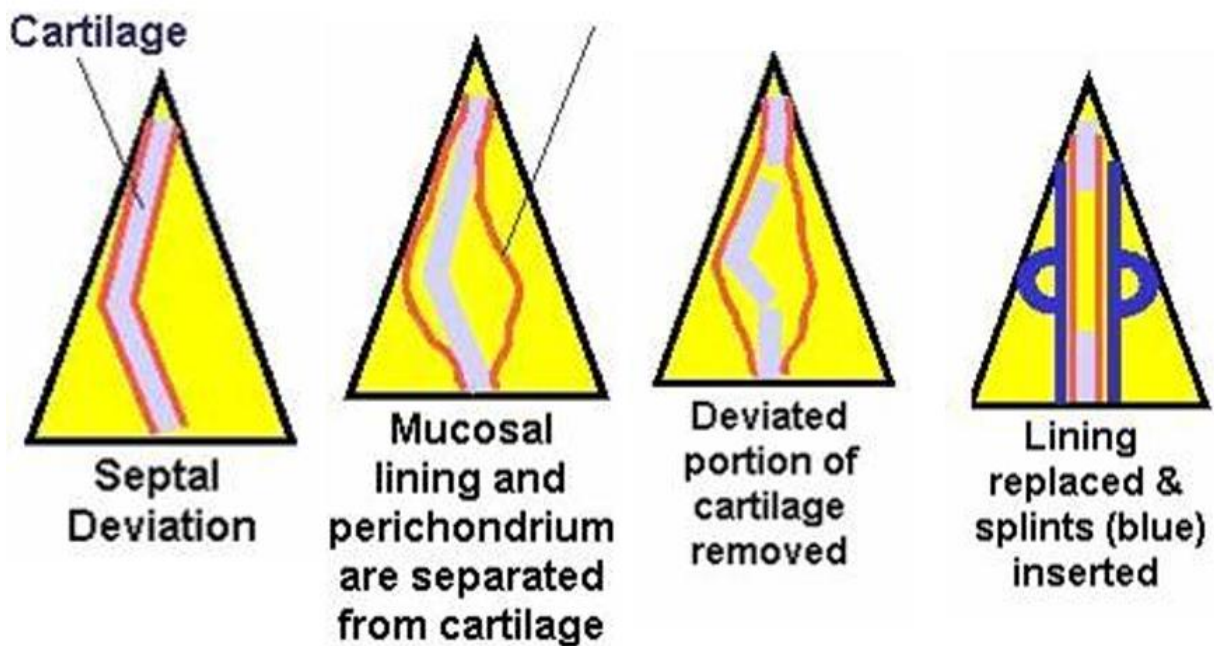
- May be asymptomatic
- Nasal obstruction
- Cosmetic deformity



Treatment:

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

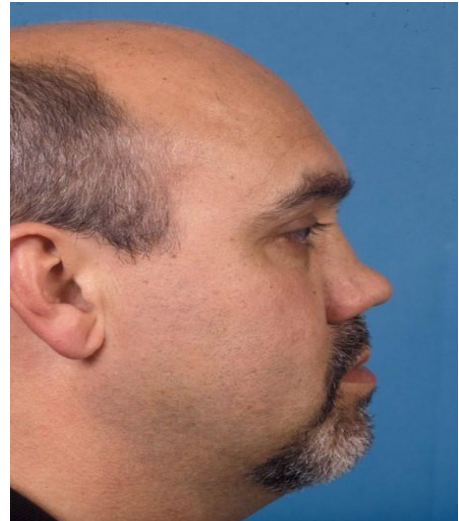
Septoplasty



Septal Hematoma:

Complications:

- Necrosis of the cartilage: Deformity (saddle Nose)
- Infection:
 - Septal abscess
 - Spread to the intracranium



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: **Immediate** Incision and Drainage.

Traumatic Septal Perforation:

Causes:

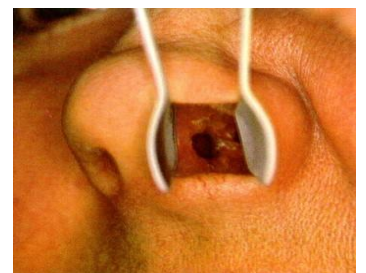
- Mostly Surgical Trauma
- May be due to self-inflicted Trauma

Symptoms:

- Might be asymptomatic
- Whistling Sound during breathing
- Crusting and epistaxia

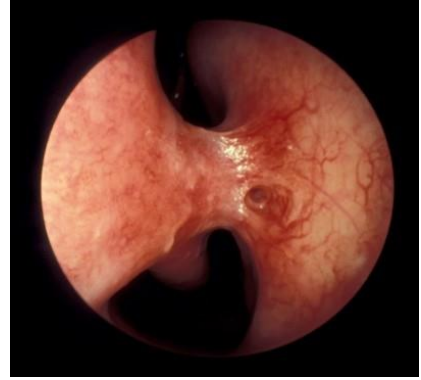
Treatment:

- No Treatment
- Nasal wash
- Surgical Repair
- Silicon Button



Synechia:

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



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
- 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:

- Meningitis
- Tension pneumocephalus

Laryngeal Trauma:

- Stridor
- Hoarseness
- Subcutaneous emphysema
- Hemoptysis
- Laryngeal tenderness, swelling and edema

Investigation: Laryngoscopy

Management:

- Tracheostomy if Bleeding or Respiratory Distress.
- Explore and Repair

Orbital Floor Fractures (blowout):

Trauma will affect the weakest part of the orbit: Floor of the orbit (roof of maxillary sinus).

- It can occur as an isolated injury Or in combination with zygomatic arch fractures, Le Fort type II or III mid-face fractures, medial wall or orbital rim fractures.
- When it is an isolated injury the object is usually intermediate in size. Not small enough to perforate the eye but not large enough to reach or affect the eyebrow or other areas of the face. The commonest example is a tennis ball.
- The force may lead to inferior rectus entrapment and fat herniation inferiomedially leading to enophthalmos due to the break in the floor of the orbit.

Patient should be referred to ophthalmologist for vision examination.

Etiology:

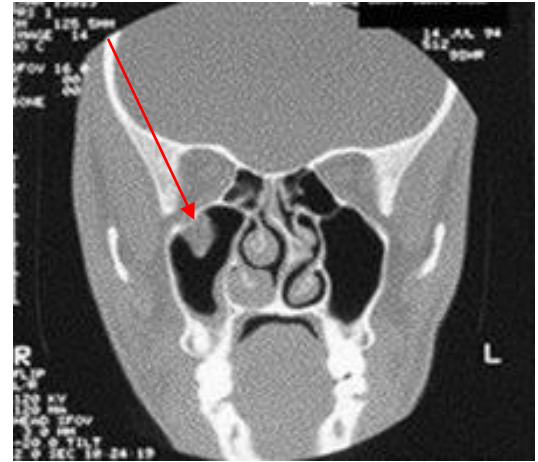
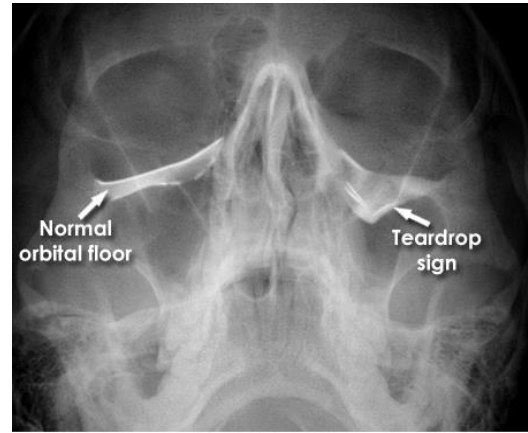
- Pure orbital floor fractures result from an impact injury to the globe and upper eyelid.
- The object is usually small enough to not fracture the orbital rim but large enough not to perforate the globe.

Presentation:

1. Limitation of movement.
2. Diplopia and restriction of upward
3. Decreased visual acuity.
4. Blepharoptosis: drooping or abnormal relaxation of the upper eyelid.
5. Enophthalmos (posterior displacement of the eyeball within the orbit)
6. Patients may complain of epistaxis
7. The globe can be ruptured
8. subconjunctival hemorrhage

Imaging studies:

- **AP X-ray** views of the orbit.
- The most common views are the Caldwell and Water's Projections (also known as occipitofrontal and occipitomenal views relatively)
- **CT scanning (The Best):** obtains both axial and direct coronal to properly evaluate the orbit and its floor.
 - **Teardrop Sign** is a radiological feature of orbital blowout fracture



Blowout fracture on CT Scan:

Coronal CT scan is showing an orbital floor fracture posterior to the globe; a fracture of the lateral maxillary sinus wall is also present.

Treatment:

Cosmetic as well as **to explore and release the displaced soft tissue**, and **to repair the bony deficit by removing or repositioning the bony fragment.**

No need for intervention in small, non-entrapped, non-infected fracture.

Surgical Treatment (Repair) for the orbital floor to be carried out through:

- **Transconjunctival approach**
- **Cutaneous approach**
- **Transmaxillary approach**
- **Endoscopically:** enter through maxillary sinus and push up the roof.

Keep in mind that it is rare to have an isolated injury so always look for other fractures and injuries.

Trauma to the Ear:

Ear trauma can be divided to External (Auricular), Middle and inner ear trauma.

It could be a laceration, avulsion (completely cut off). It could also be a burn, radiation or Hematoma.

External Ear Trauma:



Traumatic TM Perforation:

Patient might present with: History of Trauma, Earache, Deafness, Bloody Otorrhea



Management of Traumatic TM Perforation:

- **Observation:** Most cases heal spontaneously.
- **Avoid** Suction, Ear drops and water
- Elective **Miringoplasty**

TRAUMA & FOREIGN BODY PART 1 3

Red stars are the Doctor's mentioned subjects


**EXTERNAL EAR:
(Auricle injuries)

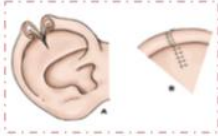
1-Hematoma ★
 Cartilage injuries in general cause hematoma. Very common, we see 2-3 cases per week. The child fell, adults were in a fight, ear got hit. Why hematoma is different in ear than in thigh? Cartilage.
 Cartilage in general does not have blood vessels; therefore it takes its nutrition either 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 (Basal 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

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Middle Ear Trauma:

Hemotympanum:

- Usually is asymptomatic
- May cause conductive hearing loss
- Treated by observation because most cases resolve spontaneously

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 condition of middle ear due to failure of the Eustachian tube to equalize an increasing atmospheric pressure
- 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:

- Prophylactic
- Decongestant, analgesic and auto inflation (Valsalva maneuver)
- Myringotomy ± VT insertion

Temporal Bone Fracture:

- Temporal bone area contains the middle and the inner ear. Fractures can be due to trauma to Frontal, Occipital or side head Injury.
- It could be due to a Blunt trauma (Most Common) Ex. RTA or a penetrating injury (Less Common)

Types of Temporal bone fractures:

- Longitudinal: 70%-80% of the cases, Conductive hearing loss (rupture drum, hemotympanum or ossicular disruption) Facial nerve paralysis is not common
- Transverse: 20% of the cases SNHL & vertigo (Labyrinthine injury) Facial nerve paralysis is common
- Mixed: 10% of the cases worst prognosis

Manifestations:

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

Diagnosis:

- The golden standard is High Resolution CT

Foreign Bodies:

Nasal Foreign Bodies:

- The most common site is between the inferior turbinate and the nasal septum.
- It differs from the ear in that the nose is part of the airway tract.
- Painful
- 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'
- Organic materials soon decompose and become infected, causing symptoms more quickly.

Clinical presentation:

- May be asymptomatic
- Unilateral nasal obstruction
- Bad odor blood stained unilateral nasal discharge

Treatment:

1. The most important thing is to secure the airway.
2. If the foreign body is located anteriorly and the child is cooperative we can remove it by forceps in the clinic.
3. 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.**

Foreign Body in the Pharynx and Oropharynx:

- Usually sharp Ex. Fish Bone is the most common and might also be Dentures or vegetable matter
- Common sites: tonsils, base of tongue and vallecula
- Diagnosis is by physical examination
- Treatment is by removal

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

- 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.
- 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.
- 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.

Foreign body in the larynx:

Clinical picture:

- Dyspnea
- Cough
- 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:

- Heimlich Maneuver
- Slapping the back with the patient's head down
- Manual removal
- Removal by laryngoscopy
- Tracheostomy or laryngostomy (cricothyrotomy)

Foreign Body in the Esophagus:

- Most of the foreign bodies are found at the level of the cricopharynx muscle. Aorta/left mainstem bronchus, Gastroesophageal junction
- Coins – 75%, Meat, dentures, disc batteries etc

Diagnosis:

- Symptoms: (Dysphagia, odynophagia, choking & cough)
- Physical exam: (Drooling, refuses oral intake).
- Radiology
- Esophagoscopy

Treatment:

- Removal via esophagoscopy
- Disc batteries and sharp objects removal are emergencies because of the risk of perforation

Esophageal perforation: ***not mentioned by the Dr but 432 team has it**

- 50% mortality rate
- The most common cause of an esophageal perforation is injury during placement of a naso-gastric tube or a medical procedure such as esophagoscopy.
- A tumor, gastric reflux with ulceration, violent vomiting, or swallowing a foreign object or caustic chemicals or dentures.
- Injuries that hit the esophagus area (blunt trauma) and injury to the esophagus during an operation on another organ near the esophagus.
- Rare cases have also been associated with childbirth, defecation, seizures, heavy lifting, and forceful swallowing.

Signs and Symptoms:

- The main symptom is pain, but the condition can progress to shock even death – if untreated.
- Signs include fast breathing, rapid heart rate, low blood pressure, and fever.
- Patient with a perforation in the uppermost portion of the esophagus (cervical part) may complain of neck pain or stiffness and air bubbles underneath the skin.
- Patients with a perforation in the middle portion or lowermost portion of the esophagus may have difficulty swallowing, chest pain, and difficulty in breathing.

Investigations:

- A chest x-ray may reveal that there is air in the soft tissues of the chest, fluid that has leaked from the space around the lungs, or a lung collapse. Do before CT
- A chest CT scan may show an abscess in the chest or esophageal cancer. X-rays taken after you drink a non-harmful dye can help pinpoint the location of the perforation. Definitive

Treatment could be either:

- Initial
- Definitive

A. Initial Phase:

- It includes diagnostic studies to determine the location and cause. Administer IV fluids and IV Antibiotics to prevent or treat the infection. Fluids that have collected around the lungs may be treated by a chest tube to drain it away.

B. Definitive Phase:

It is to repair perforation. Early surgery is appropriate for almost all patients. Every effort should be done to have surgery within 24 hours of perforation.

☐☐☐ Repair the perforation, for some patients with perforation in the uppermost part of the esophagus (neck region), the perforation may heal by itself if the patient does not eat or drink for a period of time. In this case nutrition must be provided by another source, such as a stomach feeding tube.

☐☐☐ For perforation in the mid-portion and lower-most portions of the esophagus, an operation is usually required for repair. Depending on the size and location of the perforation, the leak may be treated by simple repair or by removal of the esophagus.

Complications:

50% of the patients deteriorate.

- Possible complications include:
- Permanent damage to the esophagus (narrowing or stricture).
- Abscess formation in and around the esophagus, lungs and abdomen.
- Infection of the lungs.

Foreign bodies in the tracheobronchial tree:

- It is more serious than ingestion.
- Sometimes parents do not notice the child eating something that caused him/her to choke, or the patients were not around when it happened. Example: popcorn.

History:

- Parental suspicion in pediatrics
- Choking
- Gagging
- Wheezing: if prolonged in the chest, might be mistaken with bronchial asthma.
- Hoarseness
- Dysphonia.
- Pneumonia, foreign body can lead to infection.
- A positive history must never be ignored, while a negative history may be misleading.
- 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:

- Choking, coughing, gagging & cyanosis:
Caused by laryngeal reflexes.
- Asymptomatic phase:
Due to fatigue of cough reflex
- Wheeze, intractable cough, persistent or recurrent chest infection:
Due to emphysema, atelectasis or 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, Angiography.
- Note:** inhalation injury is more serious than ingestion, but ingestion is more common.

Treatment:

To be initiated on clinical suspicion

- Bronchoscopy: in most cases
- Bronchotomy
- Pulmonary resection

Foreign bodies in the ear:

- It's a common problem especially in toddlers.
- The vast majority of the items are lodged in the ear canal.
- Most cases of the foreign bodies in the ear are not serious.
- Common objects found in the ears include: Food material, beads, toys, and insects.

Signs and symptoms:

If the foreign body in the ear goes undetected it can cause an infection in the ear, the patient will present with:

- **discharge.**
- **Pain.**
- **Decrease in hearing.**
- **Bleeding** is also common but is not urgent: does not require immediate intervention.
- A live insect in the ear. The insect's **movement can cause a buzzing the ear.**

Treatment:

- Removal of the foreign body is done in the clinic, if uncooperative child we remove it microscopically under minor sedation; it is usually not urgent.
- Urgent removal is indicated if the object is **causing significant pain or discomfort**. Also if it was a food or a plant material such as beans **because they will swell** when they are moistened and if swollen will affect the external canal and might lead to otitis externa. If it enlarges the physician will no longer be able to remove it. Therefore, we remove it under **GA in children and give antibiotics**.
- **Remove BUTTON BATTERIES immediately** as they can decompose within 25hours in the body, allowing the chemicals to leak out and cause chemical burns. Urgent removal is required and it cause extensive granulation tissue.
- Small insects such as ants are removed by simply putting baby oil or water (contraindicated in tympanic membrane is perforated). Ticks: put some local anesthetic, they will release themselves and be easily removed.

Done By:

Othman Abid
Abdullah Al-Rowailey

