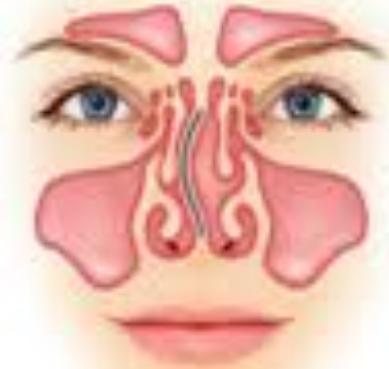


# Diseases of the Ear, Nose and Throat



7-8<sup>st</sup> Lectures:

## Trauma and Foreign Body –Part2

Done by: Ayan Hussain

Revised by: Yusra Al-Kayyali

The slides were not provided by (Fatimah Al-Anezi)  
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Important Notes in red  
Copied slides in black  
Notes in green/ blue

-The external features are NOT always indicative of the severity!  
-First thing is to make sure the airway is patent.

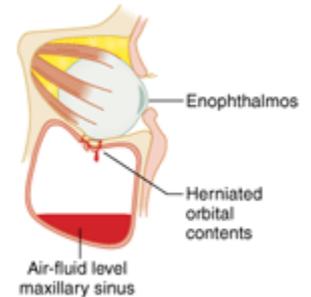
### \*\*FACIAL TRAUMA :

#### - Orbital Floor Fractures (blowout):

Trauma will affect the weak 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 inferio-medially 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 results 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.

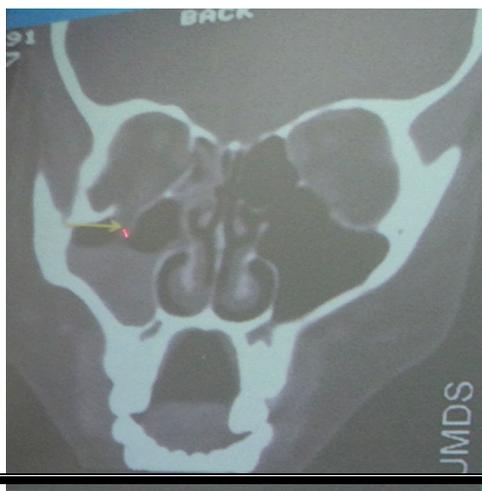
#### -Presentation:

1. Limitation of movement.
2. Diplopia (especially in up-gaze)
3. Decreased visual acuity.
4. Blepharoptosis: drooping or abnormal relaxation of the upper eyelid.
5. Patients may complain of epistaxis and eyelid swelling following nose blowing.
6. The globe can be ruptured
7. Enophthalmos (posterior displacement of the eyeball within the orbit)

#### -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 occipitomenital views relatively)
- ✓ CT scanning (**The Best**): obtains both axial and direct coronal to properly evaluate the orbit and its floor.

**Teardrop** fracture sign on x-ray



## Blowout Fracture on CT Scan:

-Facial trauma orbital floor fracture (blowout).

-Coronal CT scan image 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.

**\*Surgical Treatment** for the orbital floor to be carried out through:

- A conjunctival approach: transconjunctival
- Cutaneous exposure
- 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.

## \*\*NASAL TRAUMA:

**It is important to ask about the DURATION of trauma. (onset)**

### - Causes:

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

**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.

- ✓ 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.
- ✓ Usually swelling and edema may interfere with a proper evaluation. Therefore, we re-examine for any deviation or fracture after 3-4 days if a child or a week if an adult (children heal faster than adults).
- ü 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 its a complicated fracture, or there is a hematoma: **septorhinoplasty** needs to be done. For children wait until the age of 18.

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### Case Scenario:

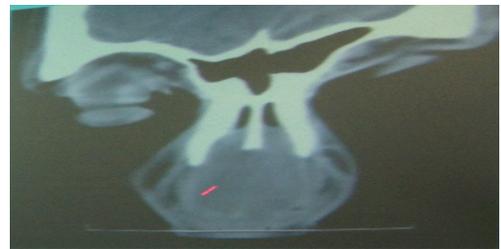
A 30 years old male presented with progressive painless nasal obstruction and widening of the nose for 2 weeks. Upon questioning he denied having any surgeries but gave a vague history of nasal trauma while playing soccer.



On Physical Examination , the septum was Ballooned, fluctuant and filled both nasal cavities.



Coronal CT scan imaging showed , Expansile swelling of the nasal septum .Notice the complete bilateral nasal airway obstruction..



### On incision and Drainage:

Thick yellow pus was recovered

A Penrose Drain was left inside the abscess cavity and Doyle nasal splint was placed bilaterally to compress the nasal septum.



## **\*\*LARYNGEAL TRAUMA:**

Very important because it is underestimated but it is life threatening.

### **-Laryngeal Anatomy:**

#### **Function:**

1-Airway

2-voice

3-Swallowing

well protected by Mandible and sternum

supports hyoid , thyroid and cricoids

Outcomes are determined by initial management ..

### **-Mechanism of injury:**

#### **1.Blunt:**

Motor Vehicle Accident, road traffic accident, strangulation (suicide), clothesline, sports related.

**Significant internal damage with minimal signs.**

#### **2.Penetrating:** its common

Gunshot wounds: damage related to velocity.

Knife: easy to underestimate damage.

### **-History is very important! Ask about the following:**

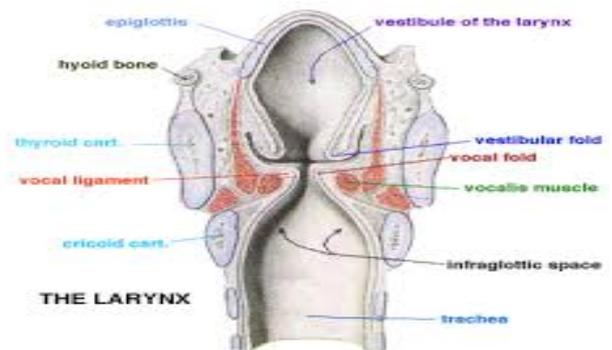
1. Change in voice – most reliable and very alarming. Indicates vocal cord involvement. Can be the only presentation
2. Dysphagia or Odynophgia following trauma.
3. Difficulty breathing (dyspnea)– more severe injury.
4. Hemoptysis
5. Anterior neck pain

### **-Physical exam: Look for:**

1. Stridor: Noisy breathing
2. Hoarseness
3. Subcutaneous emphysema: Cut in the larynx.
4. Laryngeal tenderness, ecchymosis, edema.
5. Loss of thyroid cartilage prominence.
6. Major blood vessel or nerve injury. Especially in gunshot wounds.
7. Associated injuries – vascular, cervical spine, esophageal.

### **-Investigations:**

1. **Flexible Fiberoptic Laryngoscope:** Perform in emergency room and its findings dictate next step.
2. CT scan.
3. Tracheotomy.
4. Endoscopic or external surgical exploration.
5. Other studies include angiography, cervical spine radiograph and barium esophagram swallow depend on the case itself.



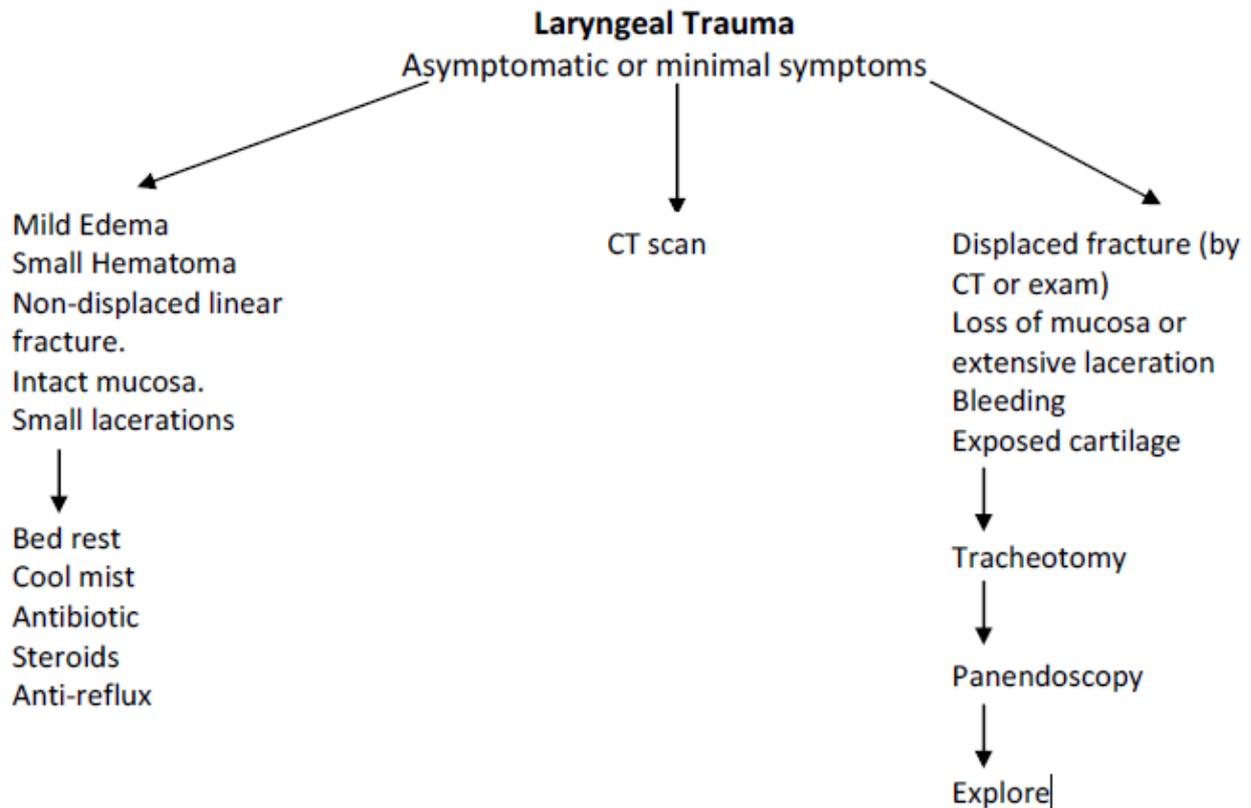
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**-Management:** you have to always secure the airway as an initial step.

**Airway management:** Laryngo-tracheal tube or tracheostomy. If inhalational injury, ventilate the patient.

**Medical management:** We might give epinephrine, steam inhalation to decrease congestion, and steroids to decrease the inflammation.

### Surgical management



## **\*\*FOREIGN BODIES:**

-It is very common in children and mentally retarded patients.

### **1-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 come 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 25 hours in the body, allowing the chemicals to leak out and cause chemical burns. **Urgent** removal is required.

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.

### **2-FOREIGN BODIES IN THE NOSE:**

- ✓ 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.

### **- 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: the foreign body's inhalation or reaching the lungs. In these cases, take the patient to the O.R and remove it under G.A.

### 3-FOREIGN BODY IN THE PHARYNX AND OROPHARYNX : IMP

- ✓ MAINTAIN PATENT AIRWAY!!
- ✓ Foreign body ingestion.
- ✓ Coins: important, if stayed in any place for a long time it will melt and its components will lead to necrosis and if in the nose it will lead to septal perforation, if in the esophagus, **esophageal perforation**.
- ✓ Meat (Fish bone)
- ✓ Vegetable matter
- ✓ Dentures
- ✓ Less than 24 hour, painful

Its size depends on whether it'll be removed in the clinic or in the OR, or if physician was not able to remove it in clinic then go to OR.

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 nonobstructing 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.

### 4-Foreign body aspiration: (lung)

- 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
- ✓ Chocking
- ✓ 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 very large object.

#### -Physical exam and investigations:

- Larynx/cervical trachea.
- Inspiratory or biphasic stridor.
- Intrathoracic trachea.
- Prolonged expiratory wheeze.
- Bronchi
- Unequal breath sounds.
- 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 and is also really good.
- 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.
  - Chest and airway AP and lat.
  - 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.

### **5-Foreign body in the Tonsils**

**6-Foreign Body in the Larynx:** dangerous if the foreign body is big

### **7-Foreign body in the esophagus**

-Most of the foreign bodies are found at the level of the cricopharyngus muscle.

### **-ESOPHAGEAL PERFORATION: 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.

### **-Symptoms and signs:**

- ✓ 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.

### **-Exams and tests:**

- ✓ **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

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- ✓ 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:**

A. Initial

B. Definitive

### **A. Initial Phase:**

It includes diagnostic studies to determine the location and the cause of the hole. 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.

- Is to repair the perforation, for some patients with perforation in the uppermost (neck region) of the esophagus, 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.