

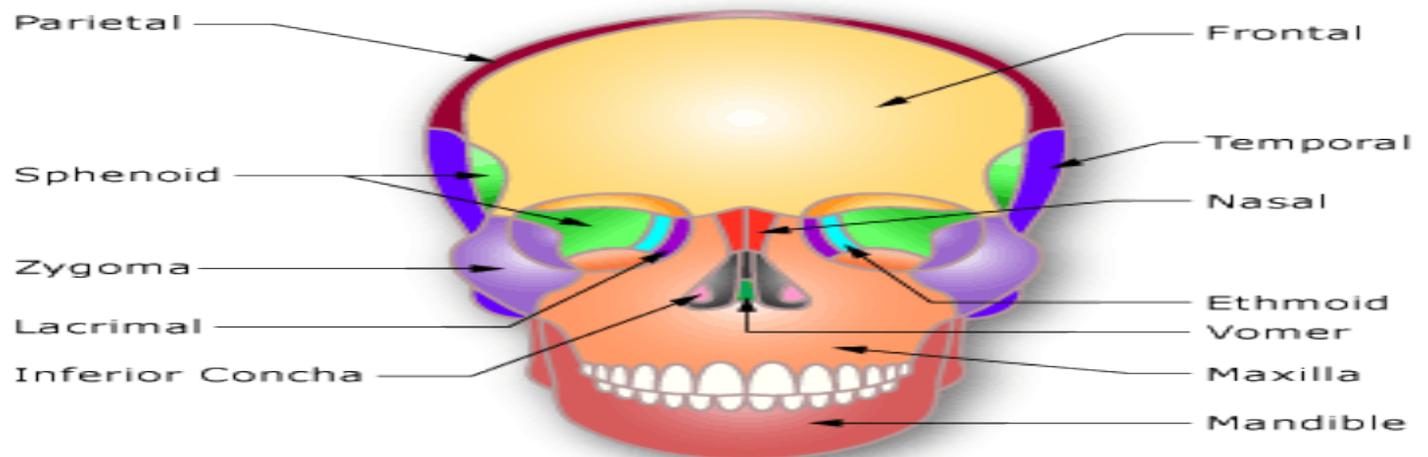


Facial & Nasal trauma

FACIAL TRAUMA

Definition

Facial (maxillofacial) trauma is **any injury (blunt or penetrating)** to the face, including soft tissue injuries such as burns , lacerations, bruises or fractures of the underlying skeleton , sinuses ,eye socket ,or teeth



FACIAL TRAUMA

□ Cause of the trauma :

- a) industrial and motor vehicle accidents
- b) interpersonal trauma (fists or weapons)
- c) sports activities
- d) accidental or work-related occurrences.

□ The principles of management:

- 1) stabilizing a patient's medical condition
- 2) providing safe reconstruction to maximize both functional and aesthetic rehabilitation



FACIAL TRAUMA

- as any trauma incident , follow initial trauma stabilization, also known as the **CABCs of trauma**:
- **First check for cervical problems**
- **Airway management and assessment**
- **Breathing**
- **Circulation**



HISTORY

- Once stable, relevant history may include:
- Mechanism of injury.
- loss of consciousness
- visual disturbance
- problems with hearing including vertigo and tinnitus?
- discharge from the ears or nose, including blood or cerebrospinal fluid(CSF)?
- problems with breathing through the nose?
- Ability to bite down without pain and feeling of whether the teeth come together normally?
- numbness or tingling on the face?



PHYSICAL EXAMINATION

Face:

-facial asymmetry.

- inspect for bruising, swelling, lacerations, missing tissue, foreign bodies and bleeding.
- Palpate for bony injury and crepitus systematically.

Eyes:

-Examine eye movements. Assess pupils.

- Check for foreign bodies and lacerations by everting the eyelids.

More detailed examination is required by an ophthalmologist if eye trauma is suspected.

Nose:

- look for dislocation and telecanthus(widening and flattening of the nasal bridge)-Palpate for tenderness and crepitus.-Look for septal haematoma, lacerations and CSF rhinorrhoea.



PHYSICAL EXAMINATION

□ Ears

-look for lacerations and CSF in the canal.

-Assess the tympanic membrane.

- tongue and mouth.
- mandible and temporomandibular joint, looking for mobility or crepitus or bruising.
- Le Fort fractures: put one hand on the anterior maxillary teeth, the other on the nasal bridge.
- Teeth Look for avulsed or mobile teeth. Look for jaw malocclusion. If a tooth has been avulsed, has it been aspirated?
- Tongue blade test: ask the patient to bite down hard on a tongue blade. They will be in too much pain to do this if the jaw is fractured.
- Place a finger in the patient's ear canal to palpate the mandibular condyle. Ask the patient to open and close the mouth. If there is pain or lack of movement, this indicates a condylar fracture.
- Perform a complete cranial nerve examination



FACIAL TRAUMA

□ SOFT TISSUE TRAUMA

1-Managing Blood Loss.

2-Prophylactic Treatment Measures

A. ANTIBIOTICS

B. ANESTHESIA

3-Wound Irrigation

4-Wound Closure

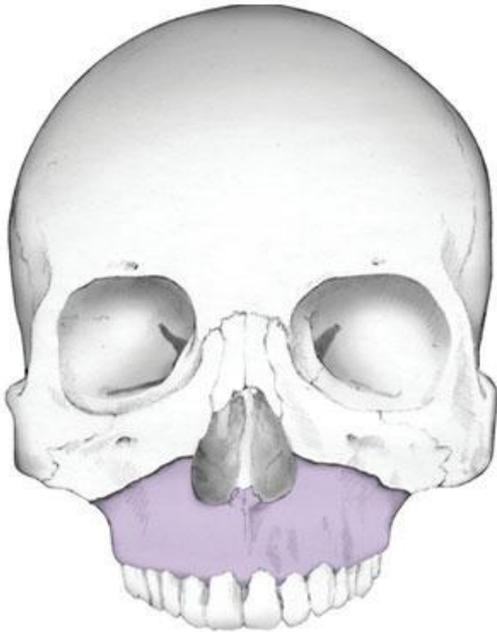
FACIAL TRAUMA

- **SKELETAL TRAUMA:**
- **LeFort fractures.**
- **Zygomatic bone [malar] fracture.**
- **Orbital [blow-out] fracture.**
- **Fractures of the mandible**

LeFort Fractures

Le fort 1

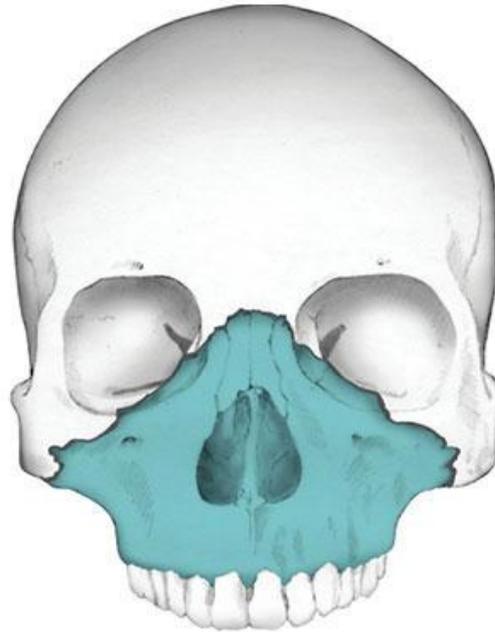
floating palate fracture
palate is separated from
the maxilla



Le Fort I

Le fort 2

involve orbital rim
the maxilla separated from
the face (sever injury)



Le Fort II

Le fort 3

craniofacial
dysfunction (very
sever injury)



Le Fort III

LeFort Fracture

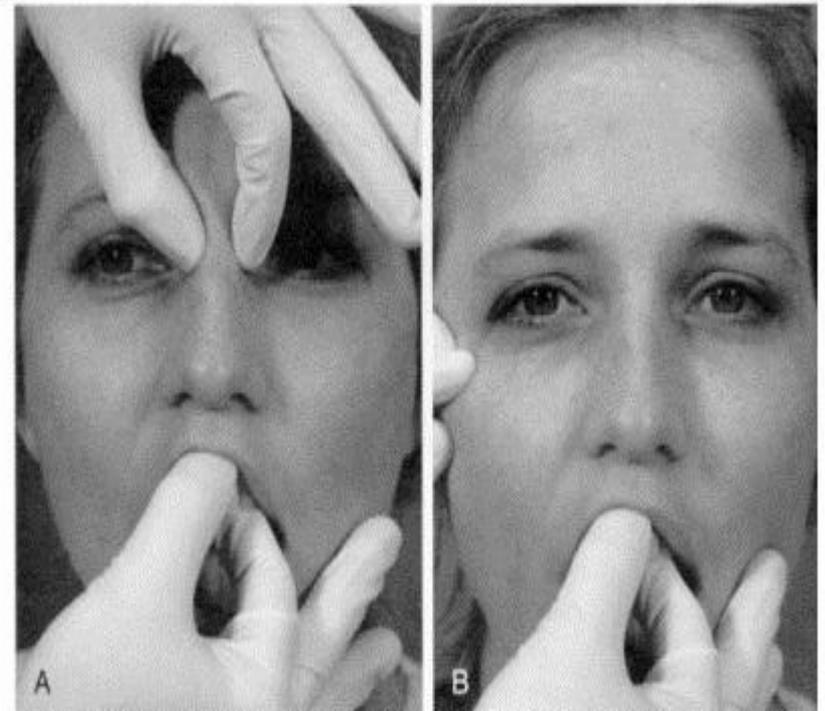
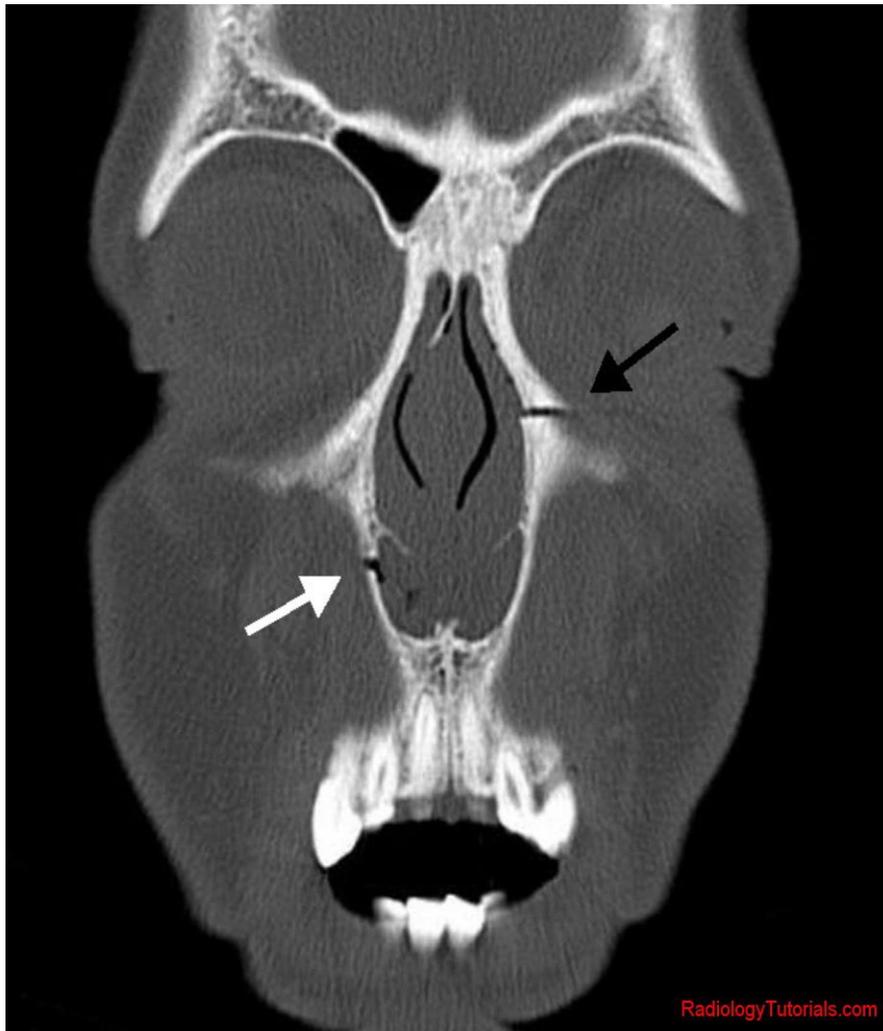
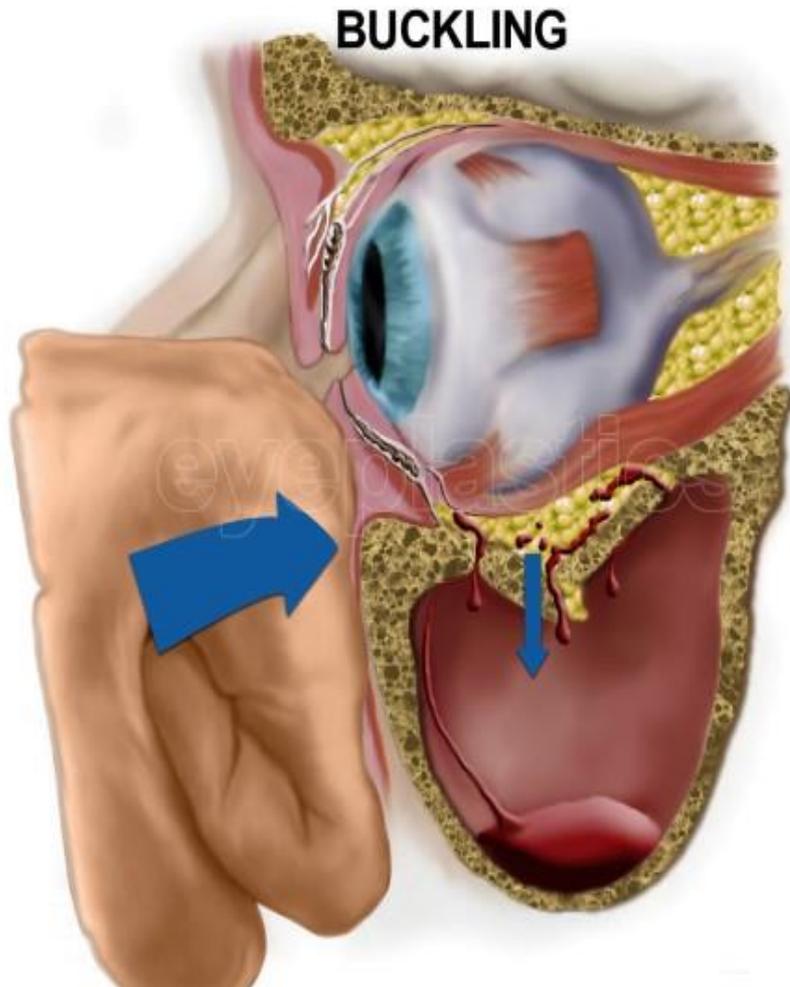


Figure 12. The method to palpate the midface for Le Fort fractures. The anterior teeth are grasped and the maxilla manipulated to determine whether it moves. If motion is palpated at the nasal bridge (A), a Le Fort II or III fracture is present. If motion is also detected at the zygoma (B), a Le Fort III fracture is present. If motion is not detected at either point but the maxilla is loose, a Le Fort I fracture is likely.

BLOWOUT Fracture

- **Orbital floor fractures occur either as a part of massive facial trauma, in conjunction with Le Fort fractures, or they may occur as isolated fractures.**
- mechanism of injury : direct anterior orbital trauma, such as from a fist or from a ball during a sporting activity
- Sudden anterior pressure on the orbital contents can cause a fracture of the orbital floor, which results in periorbital fat sagging into the maxillary sinus.

BLOWOUT Fracture

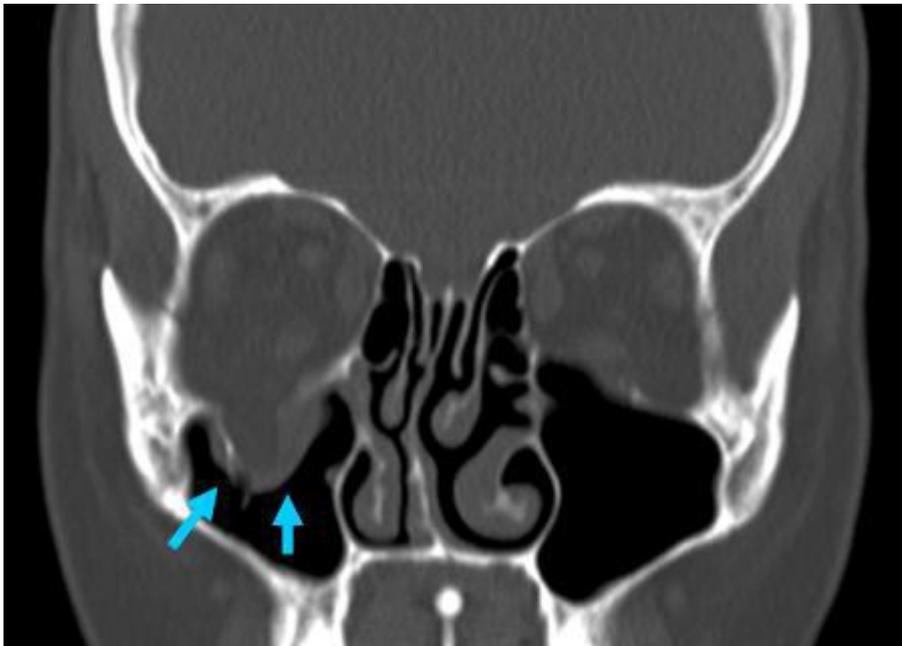


Due to the anterior blunt trauma the intra-orbital pressure suddenly increase and the thin bones break causing the content of the globe –especially the orbital muscles and some times the orbital fate- to herniated downwards to the maxillary sinus or laterally(less commonly) , sometimes trapping the contents.

BLOWOUT Fracture



Fig. 1 Bruising around the eye is a common symptom of a blowout fracture.



BLOWOUT Fracture

Overview

- Headache
- Massive Periorbital Hemorrhage
- Pain To Eye And Forehead
- Edema (Swelling)
- Difficulty Opening Left Eye
- Subconjunctival Hematoma
- Blurry Vision
- Large Periorbital Ecchymosis
- Hematoma
- Mandibular Pain
- Nausea
- Slurred Speech

Oblique View

- Multiple Bone Fragments
- Large Depressed Orbital Blowout Fracture Extending To Posterior Orbit
- Depressed Fragment Of Bone Medially
- Maxilla
- Mandible
- Orbital floor

Coronal Section

- Hypo-ophthalmic Globe
- Sub-conjunctival Hematoma
- Orbital Fat
- Bone Fragments
- Maxillary Sinus
- Hemorrhage
- Oral Cavity

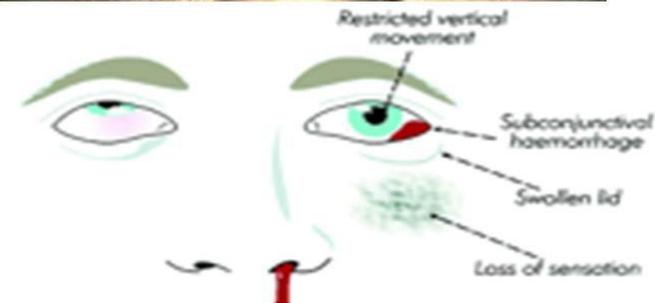
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BLOWOUT Fracture

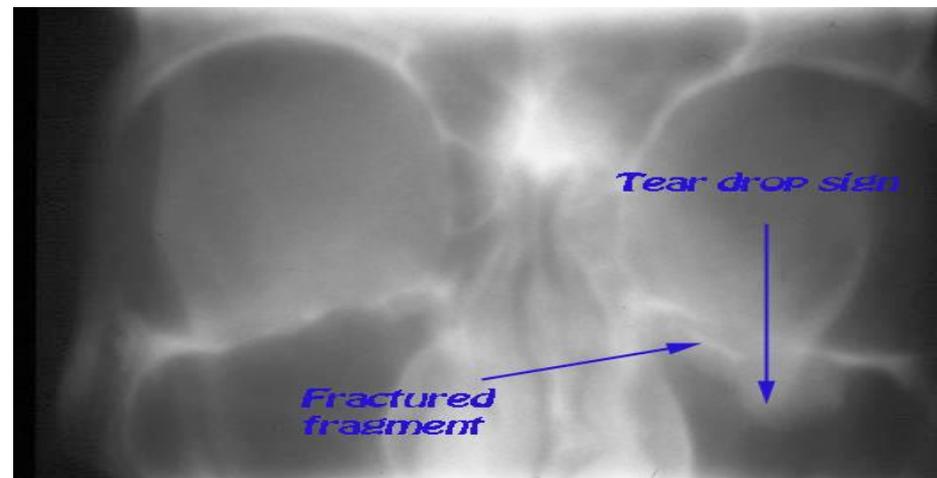
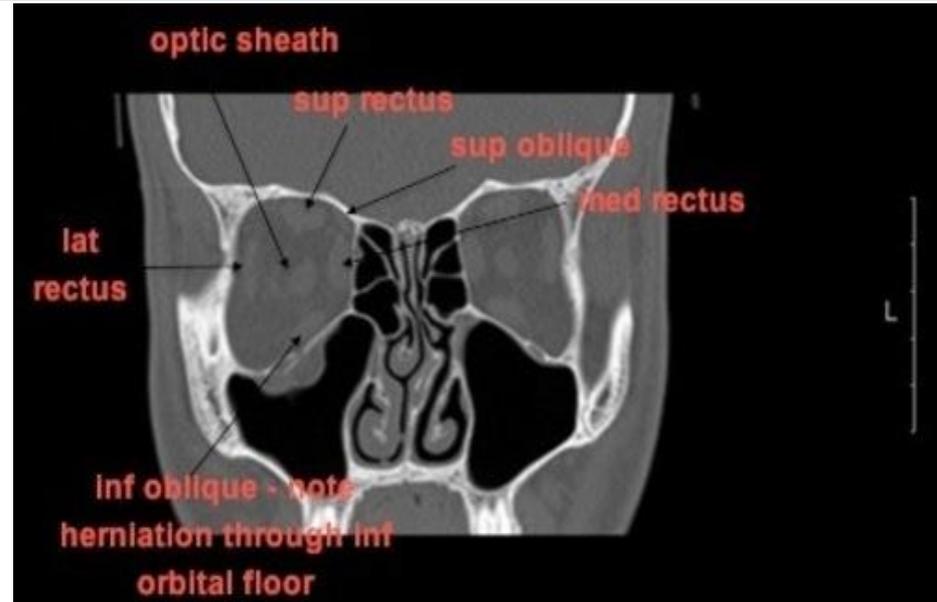
□ Symptoms and signs

1. **Diplopia**, especially on up-gaze
2. **Eyelid swelling**
3. **Enophthalmos** due to entrapment of the orbital contents
4. **Restricted eye movement (limited up-gaze)** due to entrapment of the **inferior rectus muscle**
5. **Orbital rim step deformity and visible asymmetry** of the eyes
6. **paraesthesia** below the orbital rim due to **infraorbital nerve injury** (**The orbital floor is also the roof of the maxillary sinus and has a natural weakness where the second division of the trigeminal nerve (maxillary nerve) traverses it**)
7. **Crepitus**



BLOWOUT Fracture

- **Management**
- It is highly recommended to obtain a baseline ophthalmologic exam of vision acuity and range of motion for all patients with orbital fractures, especially before proceeding with operative repair.
- axial and coronal CT scan of the orbits is essential for operative planning

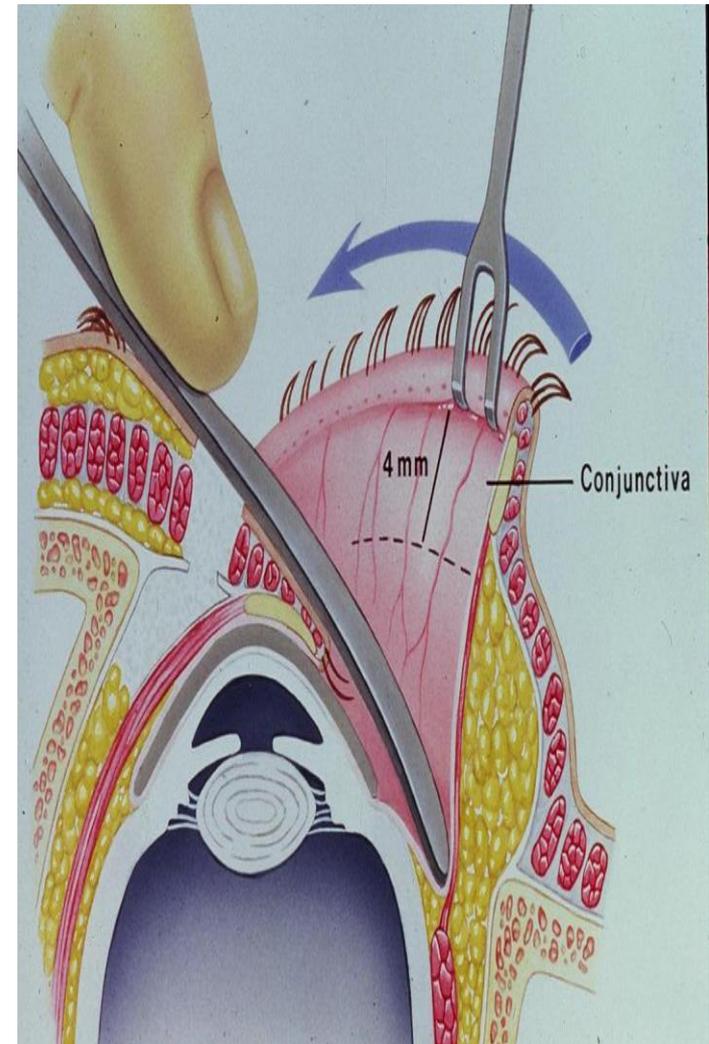


BLOWOUT Fracture

- **Treatment**(Most fractures **heal spontaneously** without significant consequence.)
 - Corticosteroid** therapy may be used to reduce swelling.
 - Antibiotics** are usually given as prevention of infection
- **Indications of surgical intervention**
 - (1)entrapment of the extraocular muscles, resulting in **gaze limitation or diplopia**
 - (2)sagging of the orbital contents, causing **enophthalmos and subsequent diplopia.**
 - (3)increased relative orbital volume (greater than **5–10%** relative increase when compared with the non-injured side) due to the loss of the orbital floor and sagging of the contents into the maxillary sinus (risk for late enophthalmos).

BLOWOUT Fracture

- **The ideal time for the repair is often 7–14 days after the injury**
- **The operative technique involves either a subciliary or transconjunctival incision, both of which give access to the orbital periosteum. The orbital contents are then raised out of the fracture line and supported with a titanium plate, cartilage, bone, absorbable plate, or other material**

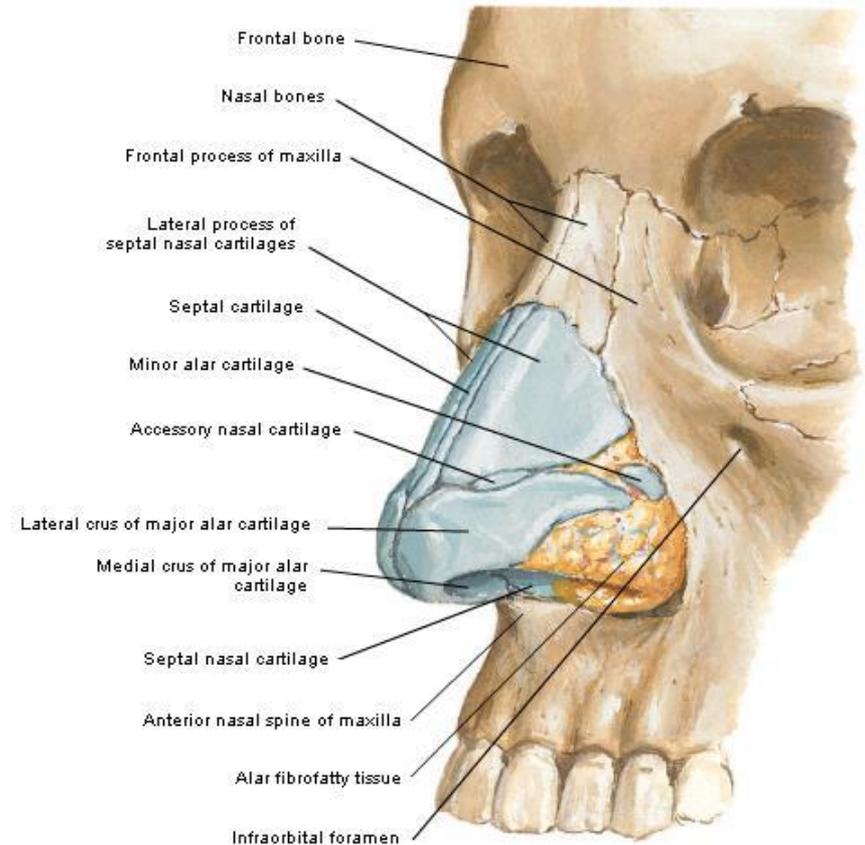


NASAL TRAUMA

- The nose is particularly vulnerable to fracture as a result of maxillofacial injury , because of the:
 1. The **central and prominent** position of the nasal bones
 2. significant **lack of skeletal support** for their position
 3. Has many structural (cartilaginous +bone)

NASAL TRAUMA

- Superiorly, the structure of the nasal bones thickens with support from the underlying nasal spine of the frontal bone, an area more resistant to injury than **the distal, thinning segment of the nose, which is unsupported and much more often the location of a fracture.**
(Tip of the nose)



SITE OF TRAUMA

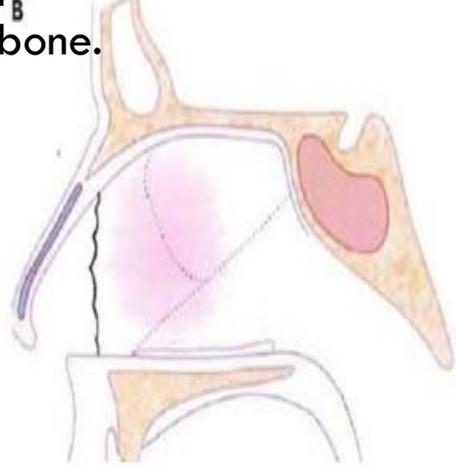
- **Cartilage:** frontal or inferior assault indirect lateral injury, often results in displacement, dislocation, or avulsion. The physical elasticity and flexible attachments of the nasal cartilage allow for the significant absorption and dissipation of energy, thus preventing considerable injury from a greater amount of force than the bony structure would tolerate.
- **Nasal septum:** a higher incidence of true fracture can be found with the cartilaginous septum as a result of trauma to the midface

Anterior hit can cause a depressed fracture

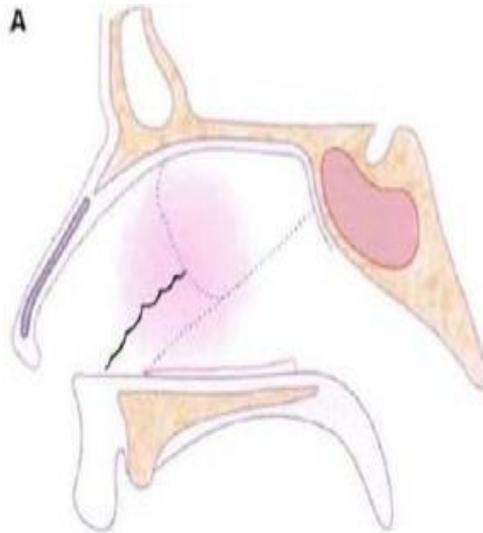
Lateral hit can cause dislocation to other side

CLASSIFICATION OF NASAL FRACTURE

class 1 fracture is usually due to a **frontal or fronto-lateral** blow and results in a **vertical fracture** of the septum (**Chevallet fracture**) with a depressed or displaced distal portion of the nasal bone.



class 2 fracture is nearly always due to **lateral** trauma and results in a **horizontal (Jarjaway fracture) or C-shaped fracture of the septum** involving the perpendicular plate of the ethmoid and the septal cartilage in combination with a fracture of the frontal process of the maxillae



class 3 fracture indicates that the velocity of the trauma has been even greater and results in a nasal fracture which extends to include the ethmoid labyrinth. The perpendicular plate of the ethmoid rotates backwards and the septum collapses into the face, turning up the tip of the nose and revealing the nostrils. There is a marked depression of the nasal bones, which are pushed under the frontal bones, and there is an apparent widening of the space between the eyes (**telecanthus**)

SIGN & SYMPTOM

- Swelling and discoloration of the skin and subcutaneous tissues covering the nasal bones and the vicinity.
- Tenderness.
- Mobility of the nose.
- Deformity.
- Epistaxis.
- Nasal airway obstruction.
- symptoms of diplopia and epiphora(Nasofrontoethmoid fractures)
- nasal swelling is often accompanied by periorbital and subconjunctival ecchymosis.
- Rhinorrhea

PHYSICAL EXAMINATION

- the nose should be viewed externally from all angles, with any unusual variations in contour, size, anatomic angles, lacerations of the skin, and hematomas noted.
- The presence and severity of epistaxis
- CSF rhinorrhea should also be noted.
- mucosal decongestion with 0.25% phenylephrine (to provide anesthesia + local vasoconstriction)
- palpation of the nasal skeleton and cartilages for any abnormal variations in position and stability, crepitus or tenderness.
- Using a nasal speculum, the nasal septum should be examined for any deformity, dislocation, swelling, laceration, and hematoma

INVESTIGATION

- **in most cases, the use of imaging studies in the diagnosis of nasal trauma is unnecessary.**
- In addition, differentiating prior fracture from acute injury in the case of minimal displacement is unlikely. Thus, since the assessment and intervention of acute nasal injury are **determined by clinical presentation, obtaining radiographs is not recommended except when legal documentation is necessary, as in the case of suspected abuse, or when the presence of additional fractures to the midface is suspected, as in more extensive injury (CT) should be obtained**

COMPLICATION

- **1) COSMETIC DEFORMITY**
- **2) EPISTAXIS AND CSF LEAK**
- **3) SEPTAL HEMATOMA AND SADDLE NOSE DEFORMITY**
- **4) AIRWAY OBSTRUCTION (Septal deviation)**
- **5) Septal perforation**
- **6) septal abscess**
- **7) rhinolith**
- **8) cribriform plate fracture**

MANAGEMENT

- IF CUT WOUND:
- **(Stop the bleeding, Clean the wound, Get stitches for deep wounds, Cover the wound, Apply an antibiotic, Get a tetanus shot..)**
- **In case of fractures..**

If there is no deformity no need for reduction

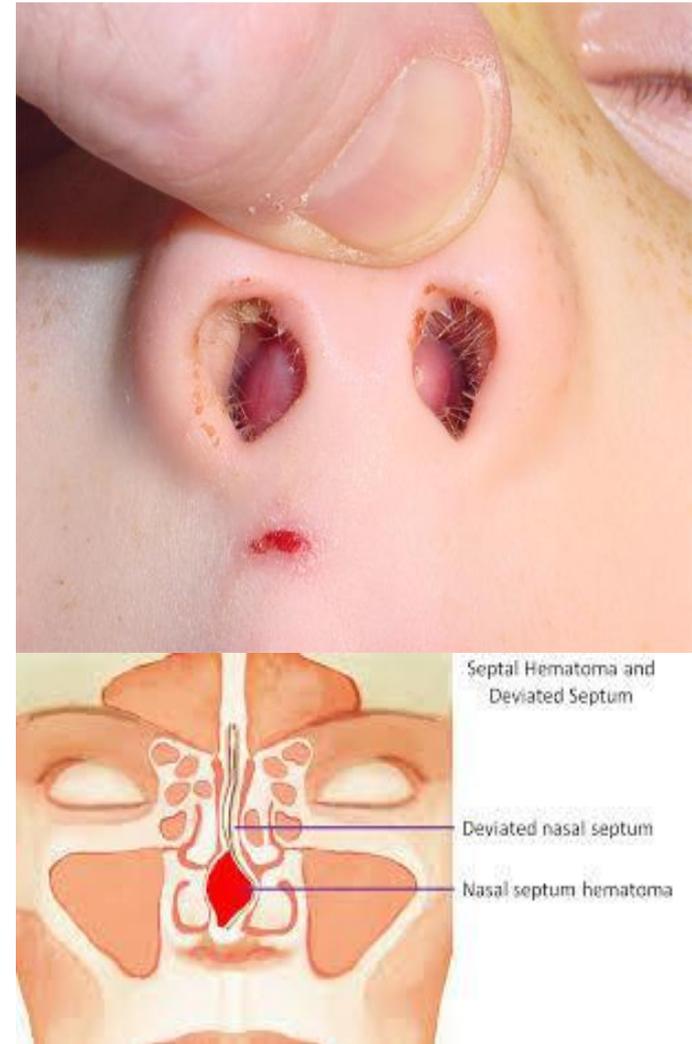
If there is deformity plan for reduction

MANAGEMENT

- Within 1–3 hours of the time of injury before significant edema has developed, **simple closed fixation of nasal fracture is possible given a cooperative patient and uncomplicated clinical findings. However, patients rarely present this early and often require reevaluation within 3–7 days to allow for extensive facial edema to subside.**
- In adults, closed reduction can be performed within 5–11 days after injury before the fractured nasal skeleton becomes adherent and difficult to manipulate, with fixation occurring in 2–3 weeks.
- In children, healing is more rapid, with adherence and fixation occurring in roughly half that time. Thus, given a significant therapeutic delay, the necessity for osteotomy and bony reconstruction becomes more likely, which is a particular concern for the pediatric population.
- Regardless of patient age, however, severe nasal trauma that results in more significant injury, such as septal hematoma, open fractures, or associated fractures of the midface and cranium, requires immediate surgical attention.

SEPTAL HEMATOMA

- **Cause:** results from **bleeding**, often **bilateral**, within the **subperichondrial plane of the septum**.
- **Complications:** If left unattended, 1) **fibrosis of the septal cartilage**, followed by **necrosis and perforation within 3–4 days**. 2) **loss of structural support leads to septal collapse, which results in a characteristic saddle nose deformity**.
- **Presentation:** excessive septal edema and severe localized tenderness on examination.
- **Treatment is urgent and includes a horizontal incision made at the septal base**
- **Reaccumulation is prevented with the application of plastic splints or intranasal packing. Antibiotic prophylaxis is also required**



SEPTAL HEMATOMA

