

- **Initial management of trauma:**

The management we do once we receive the case.

- Trauma needs a special attention in the initial management because it could be life threatening.
- The goal of the initial management isn't treating the case but to achieve multiple things:
 1. Stabilizing the patient and assure the circulation and the airway.
 2. Proper assessment for the case and noticing any other injury.
- After this we go for the definitive management.
- You need to know that in more than 50% of maxillofacial trauma we have association with other types of trauma especially if the trauma is a result of a major accident such as car accidents that's why it's important to look to other parts of the body.
- Another important thing in maxillofacial injuries is that we have many vital structures (Cranial nerves, vision, airways, brain, ears, nasal

structures..) in this area that can be affected by the trauma.

- **Causes of trauma:**

The main causes are falls, car accidents, sports and violence-according to the lifestyle and the socioeconomic status-.

- **Mid-face is divided into 3 thirds:**

1. **Upper third:** From the hairline to the glabella.

Fractures may occur to the frontal bone and supra orbital rim.

2. **Mid third:** From the glabella to the subnasale.

Fractures may occur to the orbit,zygomatoco complex,naso-ethmoidal fractures and maxilla.

3. **Lower third:**From the subnasale to the menton (chin).

Fractures may occur to the dento-alveolar process and mandible.

- If the trauma is a result of a moving object then this kinetic energy produces more force.

- **Force classification:**

High impact force: >50 times of gravity

Low impact force: <50 times

- This is important because the **Mandible,maxilla,alveolar ridge and supra orbital rim** IN NORMAL SITUATIONS don't fracture due to low impact forces –**Resist low impact forces**-“This is not implicated if the patient has some medical issues like osteoporosis or an old patient losing their teeth and results in a thin ridge”
On the other hand **the zygomatic arch and the nose can't resist low impact forces .**
- **Defenitive management oftrauma/ fractures:**
Reduction and fixation “After the initial assessment and stabilization”.
Reduction: Putting the fractured part back into its original site.
Fixation: to prevent any movement.
- **Definitive management of infection/abscess:**
Incision and drainage.
- **Definitive management of tumors:**
Biopsy

- Note that not all the face bones are thick enough to withstand fixation with mini plates and screws...etc.
- In facial bones we put these screws and plates in “**buttresses**” which are thick enough and can withstand this fixation.
- We have vertical and horizontal buttresses that should be well known to any maxillofacial surgeon.
- **Vertical buttress:** *These buttresses are very well developed.*
They include:
 1. *Nasomaxillary*
 2. *Zygomaticomaxillary*
 3. *Pterygomaxillary*
 4. *Vertical mandible*

Majority of the forces absorbed by midface are masticatory in nature. Hence the vertical buttresses are well developed in humans

- **.Horizontal buttresses:**
These buttresses interconnect and provide support for the vertical buttresses.

They include:

- 1. Frontal bones*
- 2. Infraorbital rim & nasal bones*
- 3. Hard palate & maxillary alveolus*

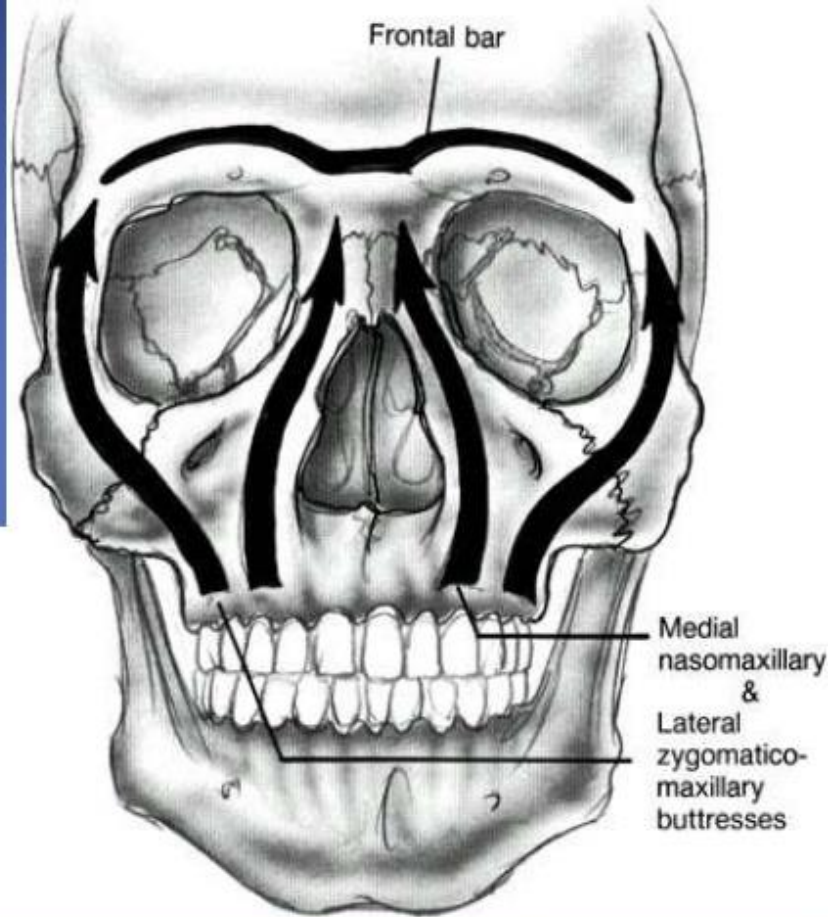
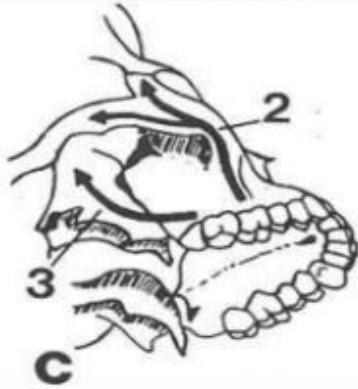
Horizontal Buttresses



- Supra-Orbital Rims with Frontal bones
- Infra-Orbital Rims
- Alveolar Process

Vertical Buttresses

- Resist occlusal load



- **Frontal bone** have an outer and inner table and the frontal sinus in between (Fractures in the frontal bone are important because they may lead to CSF leakage or brain involvement)
- **Orbital floor** fractures may affect the optic nerve and the vision, the level of eyeballs also that may cause asymmetrical eyes.
- **Nasal fractures** are the most common fractures in the maxillofacial region, why?
 - 1.The most prominent
 - 2.Easily fractured by low impact forces
- **Nasoethmoidal fractures** are usually part of other injuries, the problem that the nasoethmoidal region connects the sinuses, brain and the dura so CSF leakage may occur (Cerebrospinal fluid rhinorrhoea)
Rhinorrhoea:out of the nose.
- **Zygomatic complex fracture**:Fractures to the infra-orbital rim or at the ZF suture between the zygoma and the frontal bone.
(This type of fractures usually due to violence)
- **Symphyseal fractures** are linear fractures that run in the midline of the mandible (the symphysis).

- **Pan facial fractures:** the trauma led to fractures in different places in the face (fractures involving the lower, middle, and upper face.)
- Every trauma patient needs some investigations like lab tests,Xrays,CT scans, which depends on the severity of the case

- **ATLS: Advanced trauma life support**

is a training program for medical providers in the management of acute trauma cases, developed by the American College of Surgeons. Similar programs exist for immediate care providers such as paramedics. The program has been adopted worldwide in over 60 countries,^[1]sometimes under the name of Early Management of Severe Trauma, especially outside North America. Its goal is to teach a simplified and standardized approach to trauma patients. Originally designed for emergency situations where only one doctor and one nurse are present, ATLS is now widely accepted as the standard of care for initial assessment and treatment in trauma centers. The premise of the ATLS program is to treat the greatest threat to life first. It also advocates that the lack of a definitive diagnosis and a detailed history should not slow the application of indicated treatment for life-threatening injury, with the most time-critical interventions performed early.

- **1Airway maintenance with cervical spine protection**
- **2Breathing and ventilation**
- **3Circulation with hemorrhage control**

- *4Disability/Neurologic assessment (By Glasgow coma scale)*
- *5Exposure and environmental control*

*The **Glasgow Coma Scale** is a quick method to determine the level of consciousness, and is predictive of patient outcome. If not done in the primary survey, it should be performed as part of the more detailed neurologic examination in the secondary survey. An altered level of consciousness indicates the need for immediate reevaluation of the patient's oxygenation, ventilation, and perfusion status. Hypoglycemia and drugs, including alcohol, may influence the level of consciousness. If these are excluded, changes in the level of consciousness should be*

considered to be due to traumatic brain injury until proven

TABLE 38-2		
Glasgow Coma Scale		
BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	<i>Best response</i>	15
	<i>Comatose client</i>	8 or less
	<i>Totally unresponsive</i>	3

otherwise.

Its important to determine if there's any communication, severity and prognosis of the case also the improvement after treatment.

- **Trauma complications:**

1. **Aspiration:** Breathing in a foreign object may lead to aspiration pneumonia (a lung infection caused by pulmonary aspiration), which is one of the commonest causes that may lead to long term complications and death.
2. **Scars:** when the trauma is in the bone it's easy to reduce it and fix it and we're lucky to have a good healing in the maxillofacial area due to the excellent blood supply. Soft tissues do have a good healing but to a certain level due to scar formation (That's why maxillofacial trauma has physical and psychological impacts).
3. **Facial deformities**
4. **Nerve damage**
5. **Sinusitis**
6. **Infection**
7. **Malnutrition**

- **Legal issues** related to trauma are important (Proper history,diagnosis,management and patients consent, all have medicolegal aspects)
- Usually maxillofacial traumas have a favorable outcome and prognosis.

The doctor asked to read more about the buttresses and ATLS so the previously mentioned info in *italic* related to these subjects are some extra info that may help.