Maxillofacial injuries

Aetiology
Facial injuries may result from interpersonal violence, road traffic accidents, falls, sport, and industrial accident and missile injuries. Management of maxillofacial injuries includes the following steps:
1- Primary survey.
2- Secondary survey.
3- Definitive treatment.

Primary survey
Guidelines for the management of the injury trauma patient initially developed by the American College of Surgeons have been widely adopted and disseminated through Advanced Trauma Life Support (ATLS) to achieve two aims: save life and to restore function. A primary survey is carried out simultaneously to identify and to manage life-threatening conditions and consists of the following
A Airway maintenance with cervical spine control
B Breathing and ventilation
C Circulation with control of hemorrhage
D Disability owing to neurological deficit
E Exposure and environmental control.

*Common causes of upper airway obstruction are the tongue and other soft tissues, blood, vomit, foreign body or oedema. Obstruction may be partial or complete and management of the air can done by :
1- Position of the patient.
2- Cleaning of the oral cavity.
3- Using oral air way.
4- Endotracheal tube.
5- Cricothyroidotomy and tracheotomy

*Control of bleeding from the facial injuries can be done by pressure, packing, ligation and in rare cases ligation of external carotid artery.

*Intravenous fluids should be infused via a large peripheral vein to prevent and management of hypovolemic shock and when there is a need to maintain blood pressure. Plasma expanders such as Gelofusine or Haemaccel and crystalloids can be used for this purpose.
Secondary survey
The secondary survey is carried out once the patient's general condition has been stabilized. This consists of a top to toe detailed patient examination of all body systems. Examination of the associated injuries like head or abdominal injuries also will be done. The particular role of the oral and maxillofacial surgeon in the secondary survey is to carry out a detailed examination of the head, neck and orofacial region. Appropriate radiographs or other investigations such as computed tomography can then be arranged and definitive care planned in addition to prescribe of antibiotics, analgesia, antitetanus and documentation of the case.

*Soft tissues injuries

Clinical presentation
Lacerations and wounds affecting the maxillofacial area may involve vital anatomical structures such as the facial nerve, the parotid salivary gland duct, upper and lower lips, eye brows, cartilage of the nose or major arteries and these vital structures need careful assessment and management. Clinical presentation of these injuries are:

1- Abrasion wounds.
2- Contusion wounds.
3- Laceration wounds.
4- Incision wounds.
5- Penetrating wounds.
6- Avulsion wounds.

Radiology
Radiographs of the soft tissues may be necessary to locate the foreign bodies in a wound or to exclude an underlying bony injury. Soft tissue radiographs are taken with reduced exposure to avoid of low-density debris, and using intra-oral films wherever possible for greatest detail.
**Surgical management**

1- Wounds can usually be treated under local anaesthesia unless the patient is a young child or there is severely injured patient, so in these cases general anaesthesia is indicated.

2- Thorough cleaning is necessary before wound closure by normal saline and antiseptic material.

3- Removal of the foreign bodies

4- Skin lacerations are closed in layers. For deep layers we used absorbable material such as Vicryl or Dexon and then the overlying skin closed with fine non-absorbable material such as 6/0 Prolene or Ethilon, intra-oral wounds may be closed with Vicryl or Silk 4/0.

5- It is important when repairing a lip laceration which involves the vermilion border that it is accurately lined up to avoid an ugly step on healing.

6- Vital structures should be repaired carefully, like facial nerve and parotid ducts and special care for human and animal bites.

7- For large defect, local flaps and skin graft may be used.

8- Alternate skin sutures should ideally be removed at 4 days and the remaining sutures at 5 days to minimize scarring while maintaining wound support.

9- Antibiotics are prescribed to reduce the risk of wound infection: flucloxacillin for skin lacerations and amoxicillin for intra-oral wounds, unless contraindicated. Tetanus prophylaxis should be recommended if immunization is not up to date.

10- Infected or dirty wounds should be controlled before treatment.

11- The general condition of the patient should be controlled and factors affects wounds healing should be treated.
Facial bones Fractures

Clinical presentation
Examination of patients with facial bones fractures show deformity on palpation of bony margins of the facial skeleton starting with the supraorbital rims and progressing down to the lower border of the mandible, comparing right and left sides for asymmetry. Swelling, bruising and lacerations are noted together with any areas of altered sensation that may have resulted because of damage to branches of the trigeminal nerve. Any evidence of cerebrospinal fluid leaking from the nose or ears is noted, as this is an important feature of a fracture of the base of the skull. An intra-oral examination is then carried out, looking particularly for alterations to the occlusion.

*Mandibular fractures
Fractures are classified according to their site: dentoalveolar, symphyseal, parasymphyseal, body, angle, ramus, coronoid and condyle. They may be compound, involving the mouth (including via the periodontal membrane of teeth) or skin, or may be simple or comminuted fractures.

Clinical features:
— Pain and swelling
— Deranged occlusion
— Paraesthesia in distribution area of inferior alveolar nerve
— Floor of mouth haematoma
----Limitation of mouth movement
**Radiological examination**  
Panoramic film and postero-anterior (PA) of mandible are the basic views.

*Zygoma (or malar) fractures and orbital fractures*

**Clinical features**

— Clinical flattening of the cheek bone prominence.
— Paraesthesia in distribution area of infraorbital nerve.
— Diplopia, restricted eye movements, subconjunctival haemorrhage.
— Limited lateral excursions of mandibular movements.
— Palpable step in infraorbital bony margin.

Diplopia, restricted eye movements, subconjunctival haemorrhage.

**Radiological examination**  
Occipitomental (OM) and OM30° views are required

*Maxillary fractures*

Fractures of the maxilla are classified as Le Fort I, II or III. Le Fort I is the lowest level of fracture, in which the tooth-bearing part of the maxilla is fractured. Le Fort II or a pyramidal fracture of the maxilla involves the nasal bones and infraorbital rims, while Le Fort III involves the nasal bones and zygomatic-frontal sutures and the whole of the maxilla is detached from the base of the skull.
Clinical features
— Maxilla is mobile
— Deranged occlusion
— Gross swelling if high level fractures
— Bilateral circumorbital bruising and swelling
— Subconjunctival haemorrhage
— Cerebrospinal fluid leaking from nose (rhinorrhoea) or ear (otorrhoea)

Radiological examination

OM, OM30 views of true lateral facial bones and computed tomographic scans are helpful for complicated fractures.

*Techniques for facial fracture management.*
General principles of management of facial bones fractures include: Reduction, Fixation and Immobilization which can be done by :

1- Closed reduction and indirect fixation:
   a- Intermaxillary fixation. Fixation of the mandible and maxilla together (mandibular-maxillary fixation) is commonly refer as IMF
   b- Direct interdental wiring

2- Open reduction and direct fixation :
   a- Plating with mini- and micro-plating systems.
   b- Transosseous and intra-osseous wiring
   c- Bone screws.