

Maxillofacial Trauma

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ABSTRACT

Advancement in field of science and technology has a greater impact on approach in management of oral maxillofacial trauma, management of oral and maxillofacial trauma requires multidisciplinary approach, monitoring of ABC (Airway, Bleeding and circulation) plays a crucial role in management of patients with maxillofacial trauma in emergency condition immediate responsive treatment plays a major role is saving a life.

CHAPTER ONE INTRODUCTION

In the view of the large and ever increasing number of facial injuries ,it is mandatory for each clinician to have at least some knowledge regarding the primary care and proper referral. Each person is subjected to the ordinary risk of everyday life, is a potential candidate for trauma to face. Various methods for handling maxillofacial trauma have been evolved after many events leading to mass casualties.

No fixed protocol can govern the treatment of an injured individual ,but fundamentals of treatment with sound surgical basis should always be followed.

- *Prompt and thorough assessment of injured patients .*
- *Life threatening should be quickly recognized and treated.*
- *Acute trauma care involves many specialties ,therefore ,proper specialized consultations are asked for.*
- *Treatment of a facial injury should be guided by the functions of face and its components. Facial trauma must be considered slightly different from other trauma ;where function is the primary concern in repair. In facial trauma ,restoration of function and esthetics is a must ,otherwise a minor facial injury ,if not treated properly can become serious problem due to psychological impact.*

CHAPTER TWO

DEFINITION OF MAXILLOFACIAL TRAUMA

Maxillofacial trauma, also called facial trauma, is any physical trauma to the face. facial trauma can involve soft tissue injuries such as burns, lacerations and bruises or fractures of the facial bones such as nasal fractures and fractures of jaw ,as well as trauma such as eye injury; For example, fractures may involve pain ,swelling ,loss of function or changes in shape of facial structures.

CHAPTER THREE

MOST COMMON CAUSES FOR MAXILLOFACIAL TRAUMA

A. *Most Common Cause of Facial Trauma Includes*

- Motorcycle or Motor Vehicle Accident
- Altercation Accident
- Fall Injury
- Are Common as a Result of Blunt Injury
- Mandibullar:Zygoma:Maxillary Injury are in Ratio Of 6:2:1
- 50% are Due too Assaults
- 25% of Women with Facial Trauma are Victims of Domestic Violence.
- High Velocity Missile Injury.

CHAPTER FOUR GENERAL CARE OF INJURED PATIENTS

When a patient with a severe maxillofacial injury is first seen, an immediate general evaluation must be made to determine if emergency treatment is necessary. Hemorrhage shock, spinal cord injuries, cardiac arrest airway obstruction can cause early fatality, fractured ribs with pneumothorax or haemothorax ,rupture of spleen or kidney can pose an immediate threat , thus these conditions must be addressed at the earliest.

After through systemic evaluation and emergency treatment ,priorities for all injuries can be established. One should not rush into treatment of an obvious facial injuries without complete evaluation, at the same time treatment for facial injuries should not be delayed, soft tissue injuries should be treated within 6-8hrs or sooner ,whenever feasible. If possible ,facial fractures should be treated at the time of soft tissue repair with fracture reduction and fixation being done first.

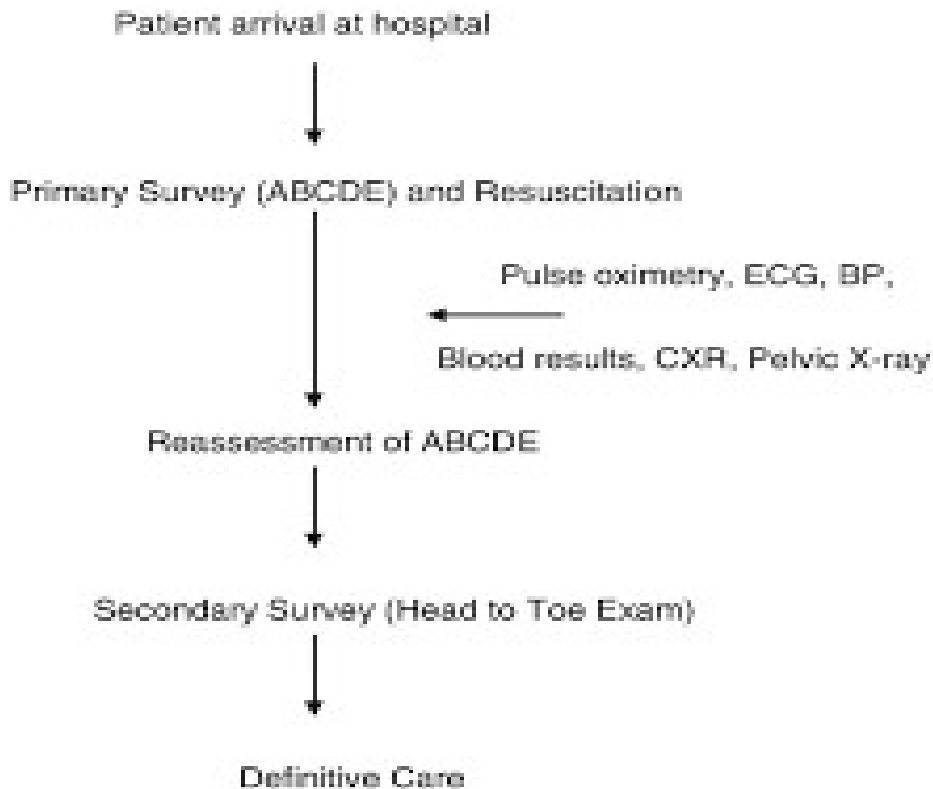


Chart 1 Indicating Management of MAXILLOFACIAL Trauma Patient.

CHAPTER FIVE

BASIC PRINCIPLES FOR TREATMENT OF SEVERE MAXILLOFACIAL FACIAL INJURIES

- *Basic Principles Of Treatment Of Severe Maxillofacial Injuries Involves.*
- Preservation of Life.
 - Maintenance of Function.
 - Restoration of Appearance(Aesthetics).

CHAPTER SIX

BASIC ABC's TO BE FOLLOWED FOR PRESERVATION OF LIFE

➤ Maintenance of Airway Patency

Maintenance of airway patency must be given priority consideration ,since adequate oxygenation is vital to life and is mainly dependent on.

- The Absence of any Anatomical or Mechanical Barrier.
- The Preservation of Laryngeal Reflex.
- The Existence of Adequate Pulmonary Ventilation.
- The Integrity of the Respiratory Center.

A simple persistent bleeding due to nasal fracture in an unconscious patient ,who is lying supine and whose reflexes are depressed by alcohol or drugs ,can easily prove to be fatal.

Wounds involving tongue,larynx,pharynx with surgical emphysema can bring about airway obstruction. Patients with associated head injury with deterioration in level of consciousness may be having depression of respiratory centers and associated lung injury may produce 'flail chest' with paradoxical respiration.

➤ Causes Of Respiratory Obstruction Related To Maxillofacial Injuries

- Inhalation of blood clot ,vomit ,saliva, thick mucus or portions of teeth ,bone and dentures.
- Inability to protrude tongue, because of posterior displacement of anterior fragment of mandible (bilateral Para symphysis mandibular fracture)
- Occlusion of oropharynx by soft palate after retro position of fractured maxilla.



Chart 2 indicating ABC's of management of maxillofacial trauma patient

➤ Treatment for Airway Maintenance

- Non Surgical

✓ Position of patient supine with neck extended or head turned sideways or patient can be made prone with head down ,so that collected saliva or blood in patients mouth can be thrown out instead of aspiration.

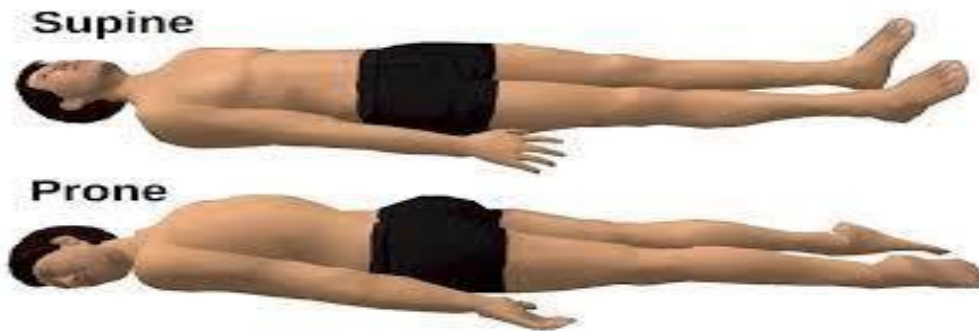


Fig 1 pictures showing supine and prone position.

- ✓ Oropharyngeal toilet
- ✓ Suction
- ✓ Anterior traction of tongue
- ✓ Immediate restoration of position of soft palate
- It can be brought about by doing disimpaction of maxillary fracture.
- ✓ Unfavorable mandibular fractures must be reduced temporarily and stabilized with dental wiring to prevent tongue fall.
- ✓ Mouth to mouth breathing
- ✓ Oro or Nasopharyngeal airways can be used.
- ✓ Endotracheal intubation as soon as possible.

➤ *Surgical*

Tracheostomy may be indicated in extensive maxillofacial injuries, a life saving oxygen supply can be delivered by puncturing into the tracheal lumen with 12-G or 14-G needle for a short time, till adequate airway management is done.

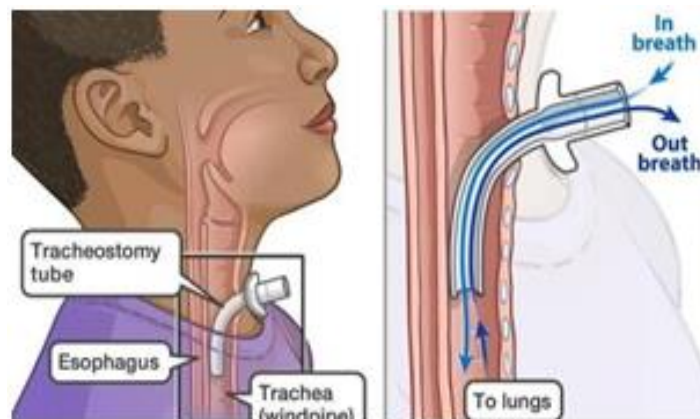


Fig 2 Image Showing Tracheostomy Bleeding and Hemorrhage Control.

Prompt control of post traumatic bleeding is a must. Initial digital compression should be done to control bleeding. Compression dressings can also be used. Major vessels which are cut should be clamped and ligated. Soft tissue wounds that deep and extensive should be sutured immediately. Nasal bleeding should be stopped by using ribbon gauze packing soaked in 1:1000 adrenaline.

➤ *Consciousness Restoration and Circulation Maintainable.*

If patient is in state of shock, an immediate venipuncture or cut down should be performed. A blood sample is sent for cross matching and IV fluids should be started to restore the circulating blood volumes. As soon as possible blood transfusion is started. Adjuvant measures like relieving pain, making patient comfortable, gentle handling, compression dressings and splinting of fractures can be done simultaneously.

CHAPTER SEVEN

TYPES OF MAXILLOFACIAL INJURIES

A. Facial Injuries Can Be Classified Into :

- Soft Tissue Injury.
- Skeleton Injury.
- Injury Involving Both Soft Tissue and Skeleton.

➤ Soft Tissue Injury

After life threatening problems have been addressed, soft tissue injuries are repaired under local or general anaesthesia. Facial lacerations should be repaired at the earliest time as soon as patient's general condition allows. Early wound repair lessens edema and prevents formation of granulation tissue and infection.

➤ Types of Soft Tissue Injury

- Contusion

Bruising injury, caused by blunt trauma, can be associated with underlying haematoma. Application of ice pack will help to stop further extravasation of blood.



Fig 3 Image showing Bruising

- Abrasion

This is the loss of a superficial layer of skin.



Fig 4 Image showing abrasion

- Hematomas

Are localized collections of blood in subcutaneous and submucosal space. Most hematomas are reabsorbed. Persistent hematomas may require incision and drainage and antibiotics are prescribed to avoid haematoma from getting infected.



Fig 5 Image Showing Haematoma.

➤ *Lacerated Wounds*

Are most frequent type of wounds .Here tearing of mucosal tissue or skin is seen due to vehicular accidents and other causes,Through cleaning ,minimum debridement ,removal of foreign bodies and proper suturing are the steps in management.

➤ *Treatment*

- *Cleaning of Wound.*
- *Removal of Foreign Bodies.*
- *Debridement.*
- *Hemostasis.*
- *Closure in Layer-Primary Closure.*
- *Dressing.*
- *Prevention of Infection.*
- *Pain Control.*
- *Follow up.*

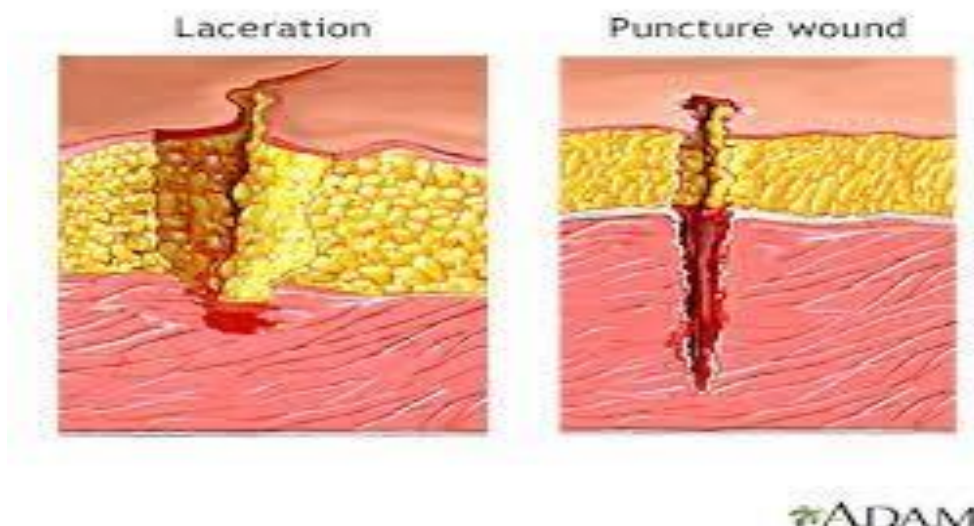


Fig 6 image showing laceration and puncture wound

• *Penetrating or Puncture Wounds*

Punctured sounds are caused by pointed objects like knife ,bomb splinter, bullet etc ,As these wounds are highly deceptive a through X ray examination and complete clinical examinations are required for management.



Fig 7 Image Showing Puncture Wounds.

- *Incised Wounds*

Incised wounds are caused by sharp cutting objects such as knife ,dagger,glass piece etc as these wounds are contaminated it should be address as soon as possible,wound is cleaned,explored and bleeding is arrested,the wound is closed by primary intention.

- *Crushed wounds*

Crushed wounds are caused by road traffic accident or machinery accident and the affected part can be crushed with lacerated skin and devitalization of crushed musculature is seen and are highly contaminated wounds.

- *Gun Shot or High Velocity Wounds*

Gunshot wounds are primarily penetrating wounds abut are classified separately because of extensiveness of the wound and special problems arising during their management. Are sub classified as

- ✓ Penetrating wounds.
- ✓ Perforating wounds.
- ✓ Avulsive wounds

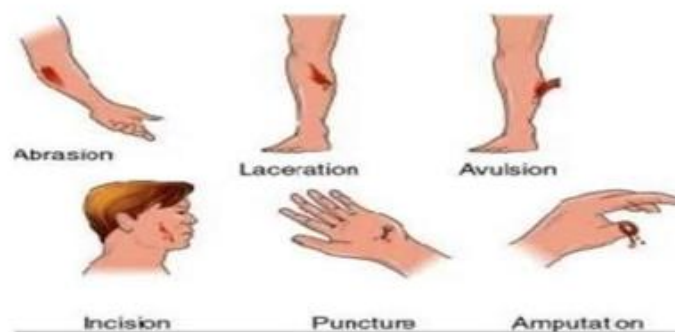
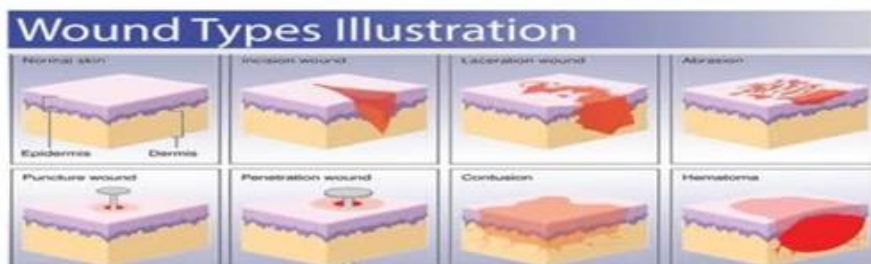


Fig 8 image showing types of wounds

➤ *Skeleton Injury*

There Several main types of facial fractures include

- *Nasal Bone Fracture*

Nasal bone fractures are most common type of facial fractures ,Usually the nose looks deformed or is sensitive to touch and feels sore after a fracture.swelling in the area might make it even worse to asses the severity of involvement,nosebleeds and bruising around nose are common symptoms of nasal fracture.

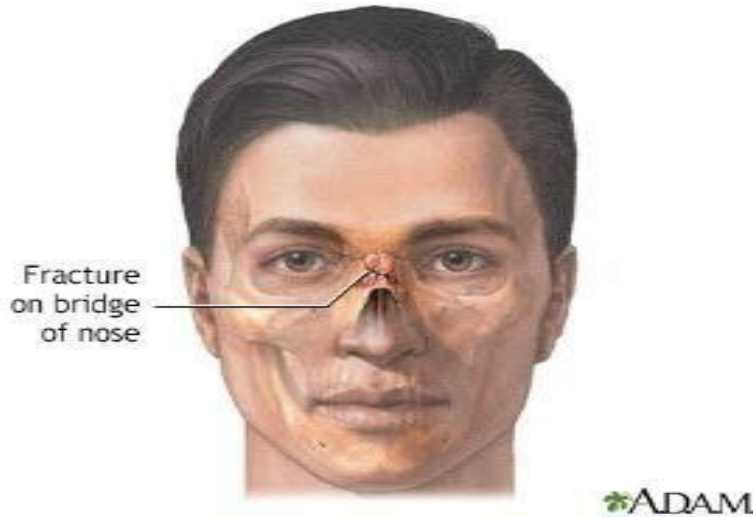


Fig 9 Image Showing Nasal Bone Fracture

- *Fracture of Frontal Bone*

A high impact injury to their head can cause a fracture of frontal bone and floor of sinuses and fracture is most likely to occur in the middle of the forehead,this injury may cause bone to be intended Associated problem may include leakage of cerebrospinal fluid ,eye injuries and damage to sinus ducts.

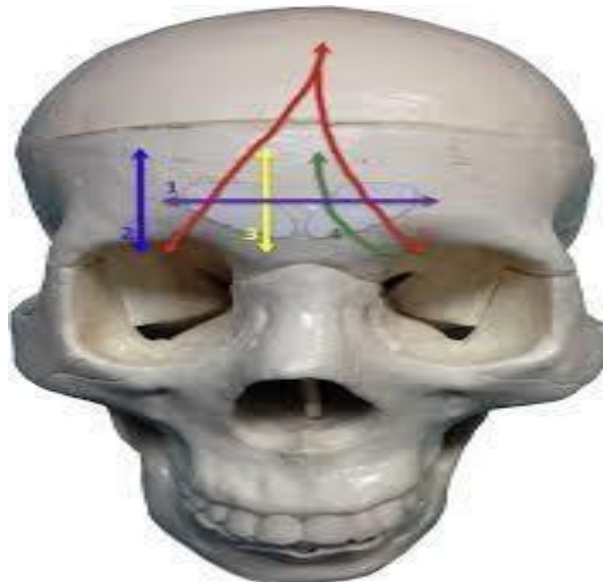


Fig 10 image showing possible fracture lines in frontal reagon

- *Fractures of Middle Third of Facial Skeleton*

Fractures of mid face depending on the level of fracture line can be classified as:

- ✓ *Low Level Fracture*
- ✓ *Mid Level Fracture*
- ✓ *High Level Fracture*

FACIAL FRACTURES AND PATTERNS WITH SURGICAL RELEVANCE: TIPS

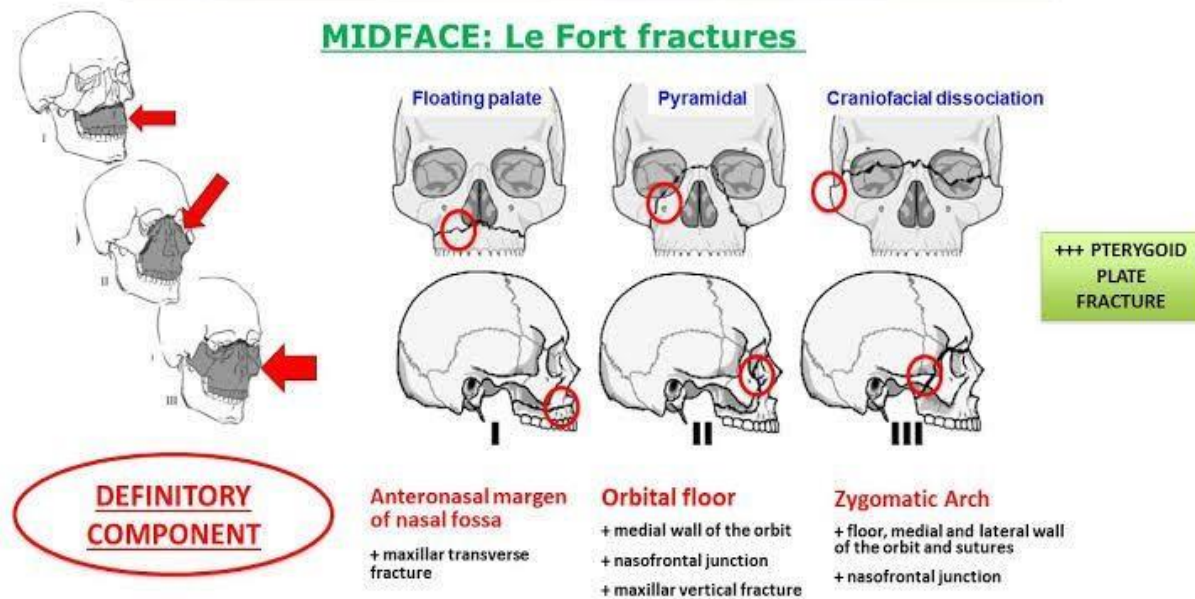


Fig 11 Image Showing Mid Face Fracture

B. Leforts Classification

➤ LEFORT 1 FRACTURE (Low Level ,Sub Zygomatic Fractures)

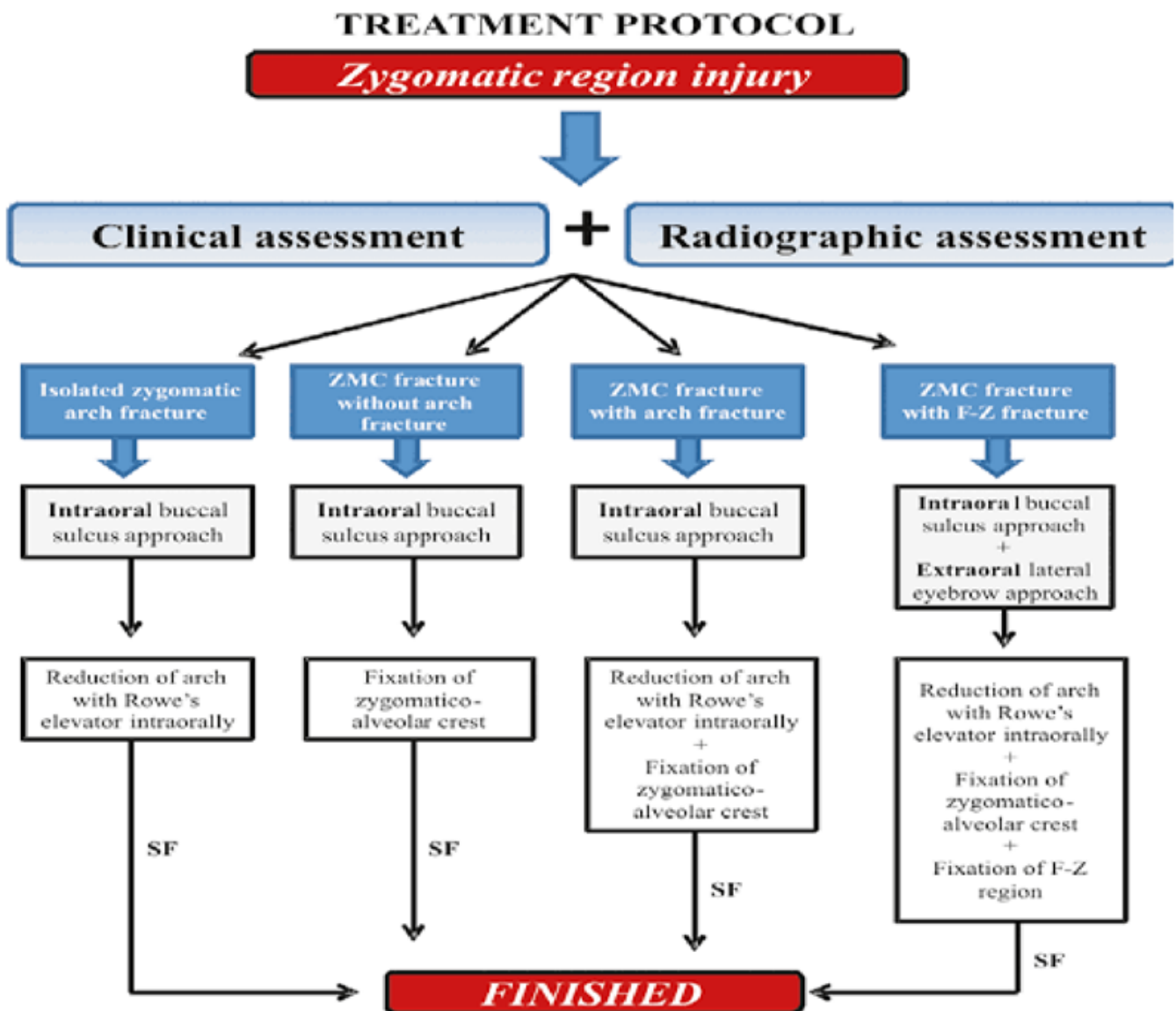
- It is also called as horizontal fracture of maxilla or Guerin's fracture or floating fracture.
- There is complete separation of dentist alveolar part of maxilla(pterygomaxillary disjunction)
- The fractured segment is only held by means of soft tissue.
- Depending on the displacement of a fragment ,a variety of occlusal disharmony can be seen .
- Clinical signs and symptoms
- Slight swelling and edema of lower part of face along with upper lip swelling.
- Ecchymosis in labial and buccal vestibule as well as contusion of upper lip .
- Bilateral epistaxis or nasal bleeding may be observed.
- Most common significant feature is mobility of the upper Denton alveolar portion of the jaw,which is mobile to digital pressure.
- Occlusion is disturbed and the patient has difficulty in consuming food.
- Pain while speaking and moving the jaw.
- Sometimes the upward displacement of entire fragment can result in telescopic fracture
- Percussion of maxillary teeth produces dull "cracked cup"sound

➤ LEFORT 2 FRACTURE (Pyramidal or Sub Zygomatic Fracture)

- Violent force ,usually from an anterior direction ,sustained by the central region of the middle third of the facial skeleton over an area extending from glabella to alveolar margin results in a fracture of pyramidal shape, the force may be delivered to the nasal bone. Clinical signs and symptoms.
- There is a gross edema of the middle third of the face known as ballooning or Moon face. Edema is seen within a short time of injury.
- Presence of bilateral circumstances, orbital edema and ecchymosis (black eye),rapid swelling of eyelids makes examination difficult.
- The nose bridge is depressed.
- If impaction against cranial base is seen then shortening of face with anterior open bite is seen.
- If there is gross downward and backward displacement then a dish shaped face is seen.
- Bilateral epistaxis may be seen.
- Difficulty in mastication and speech.
- Loss of occlusion.
- Surgical emphysema-crackling sensation transmitted to fingers due to escape of air from paranasal sinuses is seen.
- CSV leak may be present.
- Step deformity at infraorbital margins may be seen.

➤ **LEFORT 3 FRACTURE (Transverse or Supra Zygomatic Fracture)**

- Also known as high level fracture
- The line of fracture extends above zygomatic bones on both sides as a result of trauma being inflicted over a wider area at the orbital level.
- The force is usually applied from lateral direction with a severe impact. Clinical signs and symptoms
- Gross edema of face ,ballooning Panda facies", within 24-48hrs.
- Bilateral circumstances orbital /peri orbital ecchymosis and gross edema -"raccoon eyes
- "seen.
- Bilateral sub conjunctival hemorrhage ,where posterior limit is not seen ,when patient is asked to look medially.
- Tenderness and separation at the fronto zygomatic sutures is seen.
- Characteristic "dish face" deformity is seen.
- Enophthalmus, diplopia or impairment of vision ,temporary blindness is seen.
- Flattening and widening or deviation of nasal bridge is seen.
- Epistaxis ,CSV rhinorrhea is seen.



IF- Additional fixation might be required at infra-orbital margin with or without

Fig 12 Showing Treatment Protocol for Zygomatic Injury

• **Fractures of Zygomatic Complex/Fractures of Zygomatic Maxillary Complex**

The zygomas are attached at several points to the upper jaw and bones of the skull. Fracture of cheek bone can also involve other facial bones nearby .

- *Orbital fractures*

Classification

- ❑ Floor (Antral) Blow out # can be further sub-classified
 - ❑ Type I: limited elevation of effected eye due to mechanical limitation
 - ❑ Type II: limited depression due to IR palsy or flap tear
 - ❑ Type III: limited elevation & depression due to mechanical restriction and/or IR palsy or flap tear

- ❑ 'White Eye' or 'Trapdoor' fracture
 - ❑ Patient has a blowout with entrapment, but without many signs, such as swelling, ecchymosis or hemorrhage - the eye is 'white and quiet' even in the presence of a fracture
 - ❑ Mostly occurs in children or young adults when bones are more flexible and they 'snap back' and cause entrapment of tissue or muscle



15 yr old with 'White Eye' fracture

Klapper (2014)

Fig 13 Showing Fracture of Floor of the Eye and Trapdrop Fracture.

➤ *There are 3 Main Types of Orbital Fracture*

- *Orbital rim fracture-* The outer rim is the thickest part of the eye socket. It requires a lot of force to break this, as a result there may be other injuries accompanying orbital rim fracture such as damage to optic nerve.
- *Blow out fracture-*The orbital rim remains intact in this case but a crack forms at the thin bone at the lower part of the socket of the eye. The eye muscles and other structures can be entrapped in the break and restrict normal movement of eyeball.
- *Direct orbital floor fracture-*This is rim fracture extending into the lower socket.



Fig 14 Image Showing Orbital Fracture

- *Fracture of Mandible*

- ✓ Fractures of the mandible are common in patients sustain facial trauma.
- ✓ A study by Hang et al in 1983, showed the incidence in ratio of 6:2:1 of mandibular,zygomatic,maxillary fractures respectively
- ✓ Sex-Most mandibular fracture are seen in male patients and ratio is approximately 3:1.
- ✓ Age-35-%of mandibular fractures occur between the ages of 20-30years.
- ✓ Classification

➤ *There are Several Ways to Classify The Mandibular Fractures*

- *General Classification.*
- *Anatomic Classification.*
- *Relation of Fracture to Site of Injury.*
- *Completeness.*
- *Depending on the Mechanism.*
- *Number of Fragments.*
- *Involvement of Integument.*
- *Shape or Area of Fracture.*
- *Direction of Fracture and Favorably for Treatment.*
- *Presence or Absence of Teeth.*
- *A O Classification-Relevant Fixation*

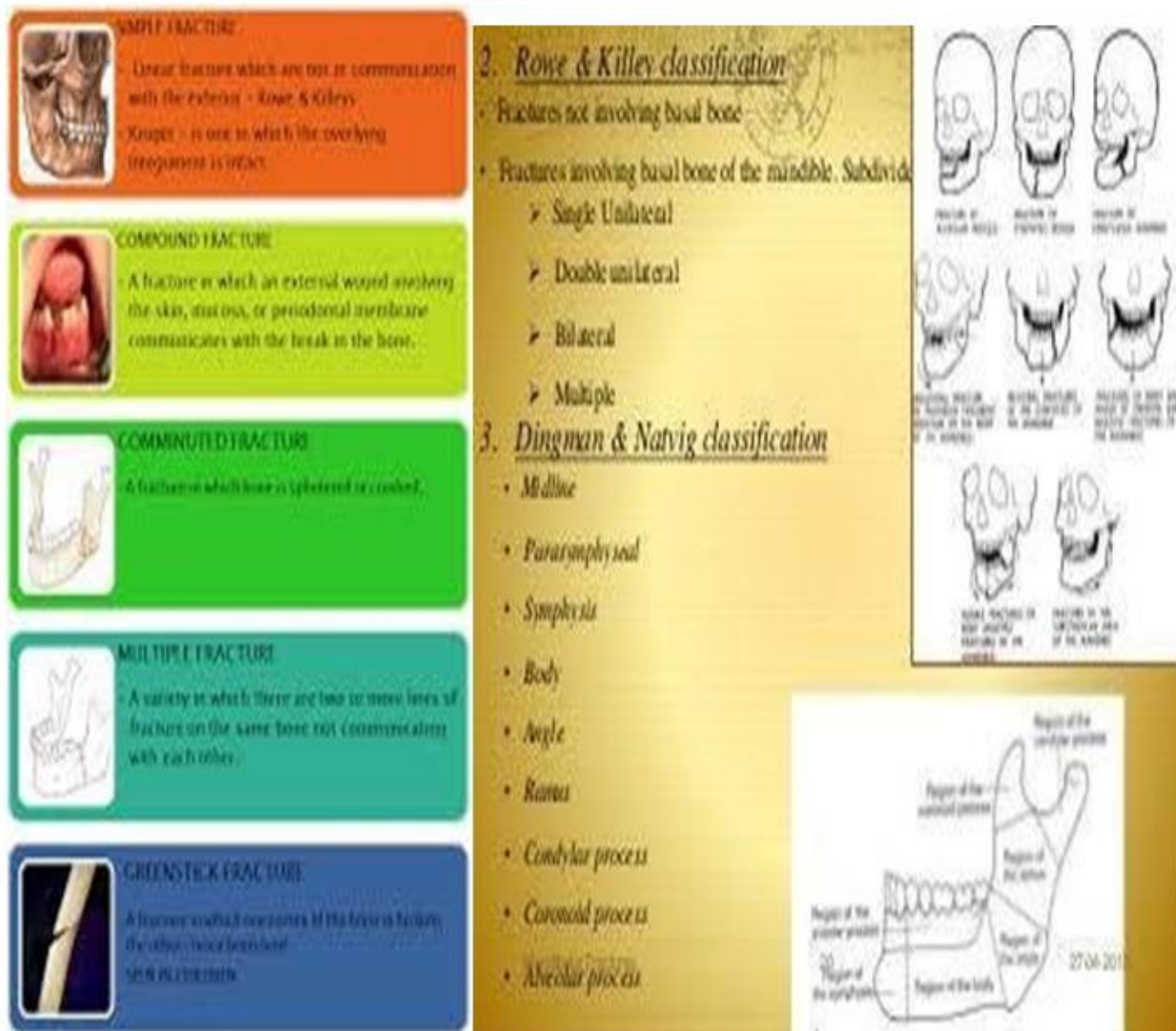


Fig 15 Image showing types of mandibular fracture

Mandibular fractures of the vertical unit

Type A/B/C: groups, subgroups and categories

Type A/B/C: Nondisplaced/ Displaced/ multibony/multifragmentary/ or defect fractures

1. Group: Isolated involvement of a single sub-unit

1.1- Angular Mandibular Fractures (Sub-Unit 1)

1. Single fracture
2. Single fracture with basal triangle
3. Single fracture with impacted third molar

1.2- Ascending Ramus Fractures (Sub-Unit 2)

1. Isolated coronoid process fracture
2. Isolated ascending ramus fracture

1.3- Subcondylar/ Condylar fractures (Sub-Unit 3)

1. Subcondylar fracture (lower third)
 - a. without luxation
 - b. with luxation
2. Subcondylar fracture (middle third)
 - a. without luxation
 - b. with luxation
3. Subcondylar fracture (upper third)
 - a. without luxation
 - b. with luxation
4. Condylar head fracture
 - a. with or without partial luxation of head and no vertical height loss
 - b. with partial or complete luxation and vertical height loss

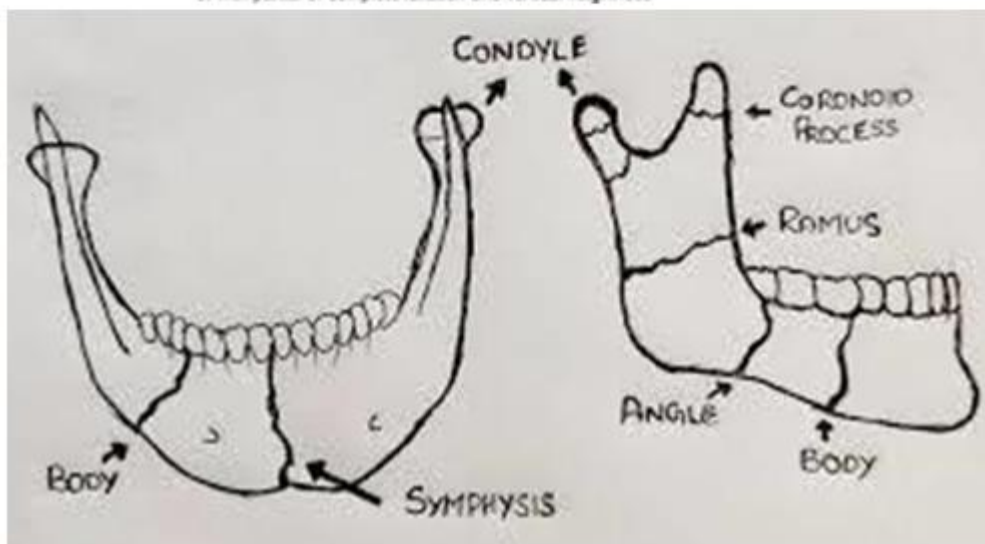


Fig 16 image showing types of mandibular fracture

CHAPTER EIGHT PATHOPHYSIOLOGY

➤ *High Impact*

- *Supra Orbital Rim -200G*
- *Symphysis of Mandible -100G*
- *Frontal -100G*
- *Angle of Mandible -70G*

➤ *Low Impact*

- *Zygoma - 50G*
- *Nasal Bone - 30G*

CHAPTER NINE DIAGNOSIS

- *First Step Towards Treating any Patient is Correct and Proper Diagnosis .the Diagnostic Sequence can be Divided Into 5 Levels:*
 - *History taking.*
 - *Clinical examination.*
 - *Radiological analysis.*
 - *Laboratory investigation .*
 - *Interpretation and final diagnosis.*
- *In any Case with Maxillofacial Trauma Involves Preliminary Examination before History Taking Ie*
 - *Examination for head injury.*
 - *Assessing level of glass gow coma scale.*
 - *Enquiring for Retrograde amnesia.*
 - *Enquiring for Anterograde amnesia.*
 - *Assessing for systemic emergencies.*
- *History Taking*
 - *A proper history in patients with trauma is required for establishing a correct diagnosis and is best if obtained in patients own words.*
 - *History taking of injury patients includes questions like who,when ,where and how did the injury happen.*
 - *If patients come from other center then what type of treatment was provided earlier should be enquired.*
 - *Questions regarding general health of patient is asked like,*
 - ✓ Allergies
 - ✓ M- Medications
 - ✓ P- past illness
 - ✓ L- Last meal
 - ✓ E- Events related to injury
 - *Questions regarding previous history of trauma ,length of unconsciousness, history of pain, vomiting, visual disturbances ,headache, confusion after accident ,history of bleeding from various sites are asked.*
 - *Blood group of patient is also noted. 2)Local clinical examination.*
- *Extra Oral Examination*

Prior to examination patients face should be gently washed with warm saline or water and cotton wool swabs should be used to clean dried blood clots or scabs.
- *Extra Oral Examination Involved*
 - *Inspection*

Inspection reveals the presence of edema ,ecchymosis and deformity. Associated soft tissue injuries should be noted.
 - *Palpation*

Palpation of extra oral areas should be started with both hands simultaneously on each half of external face,with gentle but firm pressure. This helps detect the abnormalities and one can compare the normal side with abnormal region.

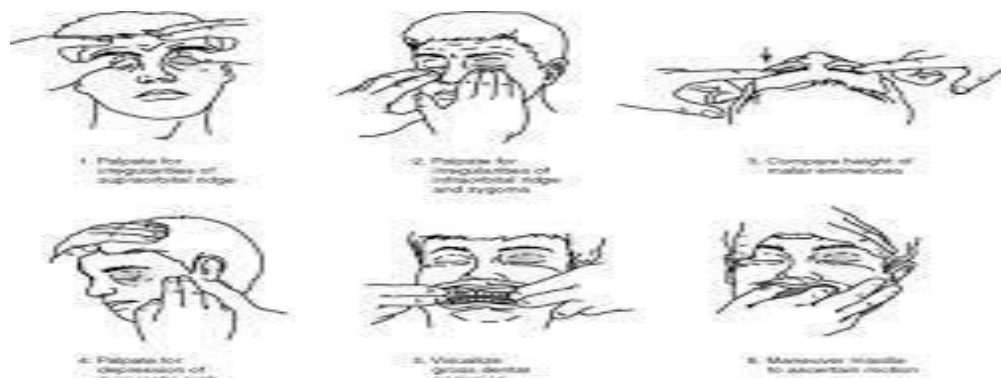


Fig 17 Image Showing Palpation in Case of Oral Maxillofacial Trauma

➤ *Intra Oral Inspection*

Restriction of oral opening ,gagging of occlusion ,lacerations , ecchymosis and damage to teeth or alveolus as noted during intraoral inspection.

➤ *Intraoral Palpation*

The buccal and lingual Sulci should be palpated for presence of areas of tenderness, alterations in contour, crepitus, mobility of teeth etc.The mandible should of the palpated bimanually and abnormal mobility should not be elicited. 3)Radiological examinations.

After clinical examination, patients should be referred for misery radiological examination can be also supplemented by computerized tomography scan examination, whenever the facilities are available. minimum X Ray required for the following:

➤ *For Fractures of Middle-Third of Face.*

- 15 Degree and 30 Degree Occipito Mental View.
- Submento Vertex View .
- Cranial Posterior Anterior View.
- Lateral View Posterior Anterior View.

➤ *For Zygomatico Maxillary Complex .*

- Occipito Mental View 15 Degree and 30 Degree .
- Posterior Anterior View -Water's Position.
- Submento Vertex Projection.
- Tomography or CT Scan of Orbit .

➤ *For Mandibular Fractures .*

- Orthopantemogram .
- Right and Left Lateral Oblique Views of Mandible
- Posterior Anterior View of Mandible
- Towne's View for Fractured Condyles.
- The Occlusal View for Mandible or Maxilla Intraoral Periapical Views for Individual Tooth Maybe Required to be Taken.

➤ *Lateral View Showing Fracture of Nose.*



Fig 18 Image Showing Lateral View

➤ *Orthopentamograph*



Fig 19 Image showing orthopentamograph

CHAPTER TEN

BASIC PRINCIPLES FOR TREATMENT OF FRACTURE

- *Reduction-for Reestablishment of form ,Function and Occlusion with Minimum Morbidity*
- *Fixation*
- *Immobilization*

- *Aims*
 - *Satisfactory Facial form .*
 - *Satisfactory Functional Occlusion .*
 - *Satisfactory Post Treatment Range of Moments of the Jaw.*
 - *No Secondary Surgery for Facial Recontouring or Malocclusion .*
 - *No Bone Grafting.*

- *Reduction:*

Restoration of the fractured fragments to their original Anatomical position, the restoration of fractured segments to their correct position maybe brought by

- *Closed reduction:*

I.e alignment without visualisation of fracture line. non-surgical intervention is needed in closed reduction ,alignment of fractured segments can be done without surgery ,occlusion of the teeth is used as a guiding factor, fractures in the tooth bearing area of the jaw are reduced satisfactorily by checking final occlusion of the teeth,closed reduction can be done by

- *Reduction by Manipulation.*
- *Reduction by Traction .*

- *It can be done by*

- *Intraoral Traction Method*
- *Extraoral Traction Method*

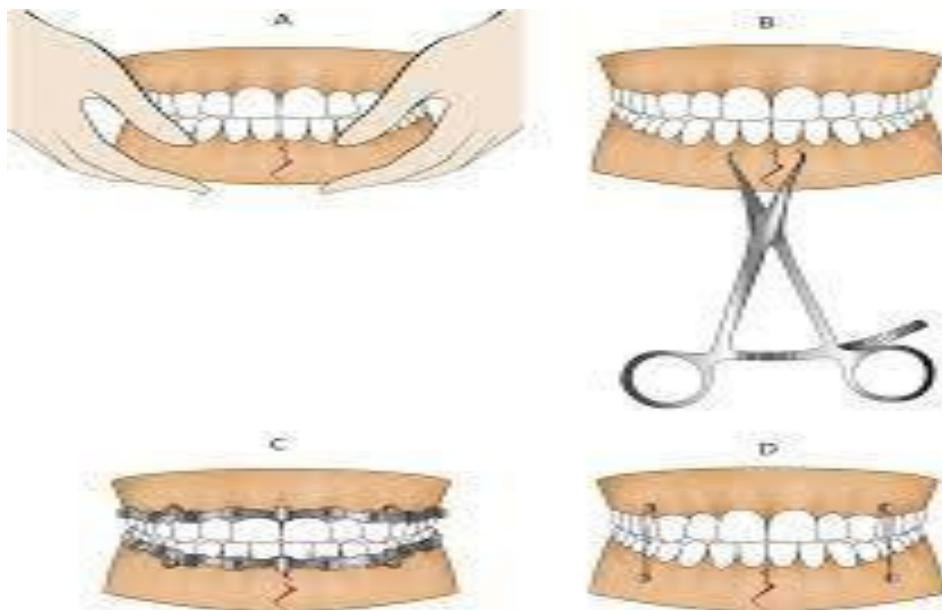


Fig 20 image showing closed reduction

- *Open Reduction*

Surgical reduction allows visual identification of fracture segments fixation. In this phase fracture segments are fixed in the normal Anatomical relationship to prevent direct displacement and achieve proper approximation fixation devices can be place internally or externally.

- *Direct Skeletal Fixation- Direct Skeletal Fixation Consists of*
 - ✓ *Direct external skeletal fixation- where the device is outside the tissue but inserted into the bone percutaneously .*
 - ✓ *Direct internal skeletal fixation -By devices which are totally enclosed within the tissues and Uniting the bone ends by direct approximation .*

- *Indirect Skeletal Fixation:*

Here the control of bone fragments is done via denture bearing area by means of Arch bars and IML or Gunning splint if patient is edentulous .It can be extraoral or intraoral method.

- *Immobilization:*

During this phase ,fixation device is retained to stabilize the reduced fragments into their normal Anatomical position, until clinical Bony Union take place. For maxillary fractures 3 to 4 weeks of immobilization period is sufficient ,while for Mandibular fractures it can vary from 4 to 6 weeks in condylar fracture the recommended immobilization period is 2 to 3 weeks only for prevention of ankylosis of Tmj Immobilization includes use of

- *Essig's wiring*
- *Risdon's Wiring*
- *Ivy Eyelets Wiring*
- *Arch Bars*
- *Custom Made Splints*
- *Acrylic Splints.*

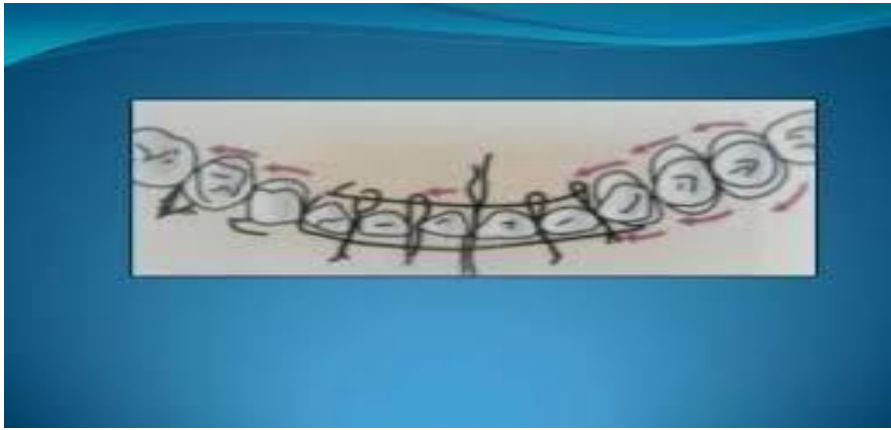


Fig 21 image showing essig's wiring

A. *Treatment of Fractures Involving Fractures of Zygomatic Bone*

In majority of cases early operation is advisable ,provided that there are no ophthalmic or cranial complication .whenever there is gross Periorbital edema and ecchymosis postponement of operation for 3 to 5 days can be done ,but it should not be prolonged for more than 2 weeks .

➤ *Stable Fractures*

Simple elevation will be sufficient because of high degree of stability due to integrity of temporal fascia and interdigitating of fracture lines ,no additional fixation is required .

- *Type 1 No treatment*
- *Type 2 unless vertically displaced*
- *Type 3 and Type 4 a ,open reduction may be required and trans osseous wiring is advisable.*

➤ *Unstable Fractures*

Unstable fractures requires open reduction and trans osseous wiring or bone plating •Types for 5 ,6 and 7 and 8

➤ *Operative Techniques*

Reduction of zygomatic fracture can be done by following approaches

- *Temporal Fossa Approach I E (Gillies Approach,192)*
- *Buccal Sulcus Approach(Keen ,1909)*
- *Lateral Coronoid Approach (Quinn, 1977) 4)Percutaneous Approach .*
- *Intra Nasal Trans Nasal Approach.*
- *Towel Clip Reduction (Todd And Carter 2005)*
- *Endoscopic Management(Herold Hopkins ,2008)*
- *Modified Gilles Approach (Swanson ,2012) In The Setting Of Bicoronal Exposure . 9)Coronal Or Bicoronal Approach.*

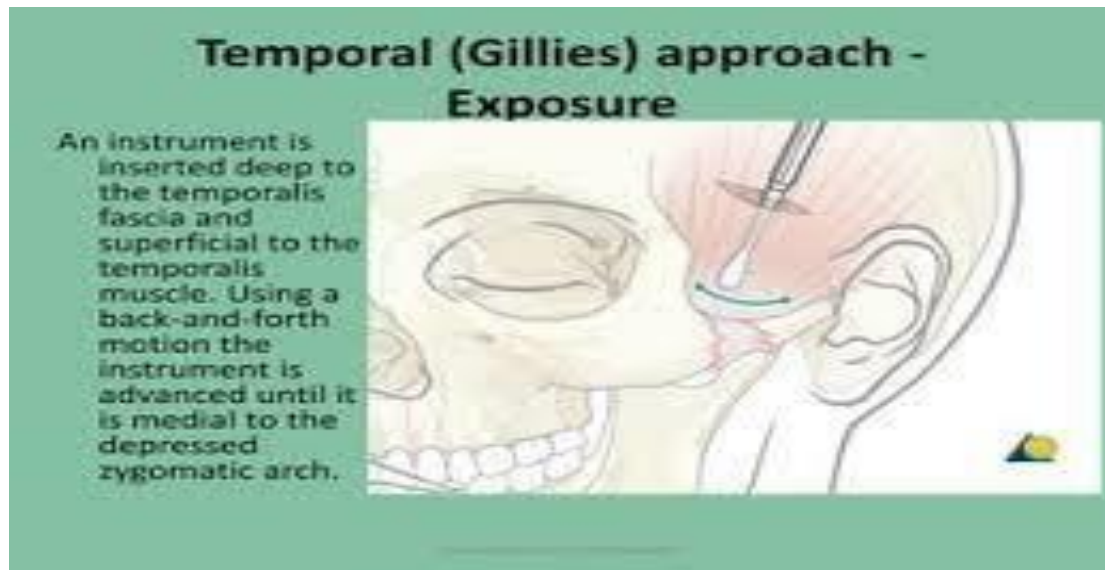


Fig 22 Image Showing Gillis Temporal Approach.

B. Management of Orbital Fractures .

- For Many Orbital Fractures Surgery is not Necessary. Treatment Protocol Depends on the Extent and Intensity of Orbital Fractures
- For Minor Injuries Recommended Use of Ice Pack to Reduce Swelling Along with Decongestant and Antibiotics
- Sneezing with Mouth Open Avoidance of Nose Blowing or Vigorous Straw Usage are Necessary for Several Weeks to Prevent Further Injury.
- Surgery is Indicated in Case of Fractures Involving Floor of the Orbit and Resulting in Blindness.

C. Management of Fractures Involving Nasal Bone

- Closed reduction is the treatment of choice for most nasal bone or septal fractures, these fractures should be reduced within 7 to 10 days .
- closed reduction can be done under local anesthesia with or without sedation or general anesthesia, it should never be conducted under intravenous sedation alone as reduction procedure will provoke bleeding; the trickling of blood near glottis may provoke a dangerous spasm.
- Corticosteroids are used to minimize edema and facilitated evolution of fracture reduction.

D. Management of Fracture of Mandible

➤ Management of Fractures Differs in Children and in Adult Patients

➤ Management of Fractures in Mandibular Region in Children can be done by

- Conservative therapy i e supervised spontaneous healing ,green stick fractures are self retentive in crack fractures or greenstick fractures with no malocclusion ,there is no need for fixation ,closed reduction is simple and attractive solution for them patient is advice to take a lot of fluids and soft food for 10 -14 days.
- Conservative treatment with splits lateral compressions splits are used.
- Open reduction
- Open reduction is usually not necessary but is advised only in case of multiple displaced fractures especially at the angle and para symphysis region .

➤ Management Of Mandibular Fractures In Adults.

• Closed Reduction

Indications

- ✓ Non displaced favorable fracture grossly comminuted fracture.
- ✓ severely atrophic edentulous mandible.
- ✓ lack of soft tissue overlying the fracture site .
- ✓ fracture in children with developing tooth bud.
- ✓ Coronoid process fracture

- *Open Reduction*
 - Indications
 - ✓ *Displaced and favorable fractures.*
 - ✓ *Multiple fractures.*
 - ✓ *Associated mid face fractures.*
 - ✓ *Associated condylar fractures.*
 - ✓ *When IMF is contraindicated or not possible to preclude the need for IMS*
 - ✓ *For patient comfort, to facilitate patients early return to work*
- *Surgical Approaches to Mandible*
 - *Intra oral approach: symphysis and parasymphysis region.*
 - *Intra oral (body ,angle ramus region)trans buccal incision .*
 - *Extra oral submandibular Dodson's Incision. Different techniques used to stabilize and immobilize fractured segments are*
 - *Trans osseous wiring.*
 - *Intra osseous wiring .*
 - *Intra oral trans alveolar or upper border wiring.*
 - *Extra oral ,lower border transossious wiring simple*
 - *Non compression bone plates .*
 - *compression plates many types of compression plates are used example :Eccentric dynamic compression plate(EDCP).*
 - *Reconstruction plate.*



Fig 23 Image showing Acrylic splints in mandibular fracture.



Fig 24 Intra oral image of intermaxillary fixation



Fig 25 Intra oral image of intermaxillary fixation

CHAPTER ELEVEN CONCLUSION

The gravity of all maxillofacial injuries lies in the fact that they pose an immediate threat to life as a consequence of its proximity to both the airway and brain. Always first patients emergency conditions should be addressed followed by treatment of soft tissue laceration .All the same, each case is unique; thus, the management is particular even for the most experienced of professionals. In any given scenario no treatment approach can be described as being sure and flawless. Best use of golden time is most required action to be taken, The need of the hour is a multipronged approach requiring a partnership between several departments. While new technology and material developments have helped ease the situation, it is the timely intervention, sheer skill, and presence of mind of emergency personnel, and surgeons that counts.

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