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Classification Systems for Craniomaxillofacial Trauma

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Abstract

The management of facial fractures begins with the establishment of an accurate diagnosis. Knowledge of typical patterns of facial fractures is important because each pattern may be associated with its respective functional complications. The anatomy of the maxillofacial region plays an important role in various morphofunctional aspects such as mastication, respiration, olfaction, vision, facial form and aesthetics. Depending on the site of the injury, there are different classification systems that have been proposed which includes zygomatic, naso-ethmoidal, orbito-zygomatic, orbito-ethmoidal, and craniofacial fractures. The various fracture of maxillofacial skeleton includes midface, orbit, zygomatic complex, nasoethimoidal complex, condyle, coronoid and other parts of mandible, frontal nasal and alveolus. This narrative review compiles various accepted classifications of facial fractures.

Keywords: Trauma, Maxillofacial trauma, Midface, Zygoma, Mandible, Orbital

Introduction

Facial trauma is one of the most commonly encountered clinical situation in emergency ward. Maxillofacial surgeons face challenges to treat facial trauma in these patients because of multiple concurrent injuries, patients unwillingness to cooperate with clinicians to conduct a comprehensive physical examination and diagnosis. Understanding the usual patterns and classifications of facial fractures especially mandible, the naso-orbito ethmoidal complex and lefort II or III fractures, is crucial because each pattern is frequently related to specific functional and aesthetic issues.[1] The anatomy of the maxillofacial regions

includes various morphofunctional aspects such as respiration, mastication, olfaction, vision, and facial form and aesthetics. The maxillofacial skeleton is made up of articulated and interdigitated bony components making it hard to fracture a bone alone without also causing damage to nearby structures. Depending on the site of the injury, there are different classification systems that have been proposed which includes zygomatic, naso-ethmoidal, orbito-zygomatic, orbito-ethmoidal, and craniofacial fractures.[2] There are also specific classification to classify the location and type of mandibular and orbital fractures. Currently, the most common way that fractures are classified is based on their anatomical location and type of injury which are usually determined through radiography with CT as gold standard in addition to thorough clinical examination. The most common causes of facial fractures are road traffic accidents (RTA), falls, sports injuries, gunshot wounds and occupational accidents.[3,4]. Classification of facial fractures helps in establishment of an accurate treatment plan and prognosis. This narrative review discusses about various accepted classifications of cranio maxillofacial trauma.

Classification

In the most basic terms, fractures can be described as either simple, compound or complex, where the former involves usually a single anatomical subunit, whereas the latter two composes multiple units with well-described patterns exposing into oral cavities. The maxillofacial fractures can be classified based on the location into midface, orbital, zygomatico-maxillary complex, naso-ethmoidal complex, mandible, condyle, coronoid, fronto-nasal complex, alveolus.

Midface fractures

The midface fractures are classified by AOCMF, Rene Lefort classification, Erich's classification system, Rowe and Williams and Marciani modification of Lefort fractures.

AOCMF Classification

Le Fort fractures can be understood through three virtual horizontal partitions along the vertical nasomaxillary buttresses of the central midface: the Lower Central Midface Partition (LCMP), the Intermediate Central Midface Partition (ICMP), and the Upper Central Midface Partition (UCMP). These partitions help define the different levels of fractures.

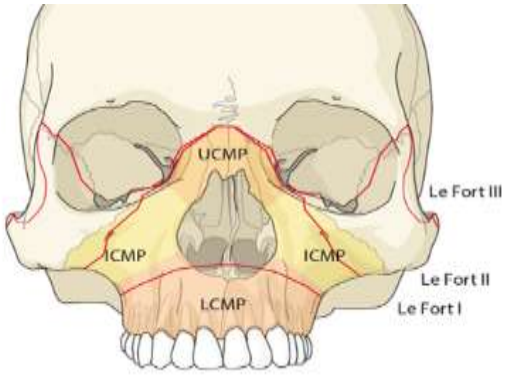

Figure 1:

The lateral midface is considered as a single unit composed of the zygoma and the zygomatic arch. In this classification, the zygomatic arch extends posteriorly to the temporal bony base of the glenoid fossa without involving the zygomaticotemporal suture line. However, the orbital surface of the zygoma, specifically the lateral orbital flange, forms part of the lateral orbital wall and is categorized as such. The lateral midface can be involved in isolated fractures of the zygomatic-orbital complex, often seen as a subcomponent of a Le Fort III fracture, which involves craniofacial disjunction and impacts the zygomatic bone and surrounding structures. Midface fractures typically occur at predictable sites that link to the maxillofacial skeleton's comparatively weak areas. René Le Fort coined the phrase "universal fracture patterns" based on his studies with cadaveric skulls. Fragmentation, displacement, and bone loss are

indicative of a fracture design in the central midface.[5] The number of fracture lines—0 ¼ non-fragmented, which includes a single twisted or straight fracture line—or 1 ¼ fragmented—more than one fracture line—determines the fragmentation within the partitions. There are medial and lateral subregions within the UCM, which is made up of the medial orbital rims and the nasal skeleton.[6] The paired nasal bones make up the medial, or central, portion. The frontonasal maxillary processes, which together comprise the nasal sidewalls and medial orbital rims, regulate the nasal bones over the nasal orifice. The vomer, the perpendicular plate of the ethmoid, and the quadrangular cartilage make up the nasal septum.[7]

Le Fort explained three distinct patterns which includes

- palatofacial disjunction,
- mid facial separation, and
- craniofacial dysjunction [8](Figure 2)

Le Fort Type 1

Lefort 1 fractures, also known as trans-maxillary fractures, are caused by a force that is applied downwardly towards the maxillary rim. This occurs at the level of the nose base in the horizontal plane. Pterygoid and maxillary sinus fractures affecting all three walls are caused on by a direct impact to the lower face. The fracture extends through the nasal septum, the pterygoid plates, and both maxillary antra. Palate-facial separation results from this. But neither the zygoma nor the glabella are involved in this fracture.

Le Fort Type II

A midface trauma is the root cause of Lefort 2 fracture which is also called as pyramidal fracture. The fracture line extends obliquely through the inferior orbital rims and medial aspect of the orbits, commencing from area of the nasal bridge (nasion). The pyramid-shaped face skeleton separates from the rest of the skull as it proceeds posteriorly in a horizontal manner above the hard palate, involving the pterygomaxillary buttresses. In this case the zygoma is still joined to the skull.[8]

Le Fort Type III

Le Fort III which is also called cranial-facial separation, the fracture line in this type extends from the nasofrontal area across the posterior ,medial, the zygomatic arch, lateral orbital walls, , and through the upper portion of pterygoid plates.[8]

Figure 2: Le Fort fracture classification

Erich's (1942) classified midface fractures as per the direction of the fracture line

- Horizontal fracture
- Pyramidal fracture
- Transverse fracture.

Midface fractures can also be classified depending on the relationship of the fracture line to the zygomatic bone as:

- Suprazygomatic fracture - Above or including the zygomatic bone
- Subzygomatic fractures - Below the zygomatic bone

Depending on the level of a fracture line in the mid-face region, these fractures are classified as:

- Low-level fracture
- Mid-level fracture
- High-level fracture

In 1985 Rowe and Williams attempted classifying midface fractures depending on involvement of

dentoalveolar component. The classification divided midface fracture as

Fractures not involving the dentoalveolar component

Central region:

- Fractures of the nasal bones and/or nasal septum
- Fractures of the frontal process of the maxilla
- Naso-ethmoidal fractures
- Fronto-orbito-nasal dislocation

Lateral region:

- Fractures involving the zygomatic bone, arch and maxilla (zygomaticomaxillary complex) excluding the dentoalveolar component.

Fractures involving the dentoalveolar component

Central region

- Dentoalveolar fractures
- Subzygomatic fracture

Le Fort I (low level or Guerin)

Le Fort II (pyramidal)

Combined central and lateral region fractures

Le Fort III

Le Fort III with midline split

Le Fort III with midline split + fracture of the roof of the orbit or frontal bone

In 1993, Marciani introduced the first classification of maxillofacial trauma involving the cranium modifying Le Fort classification. He included Lefort IV fracture system in the modification. The classification describes midface fracture into: [29]

LeFort I: Low maxillary fracture

I a: Low maxillary fracture/multiple segments

LeFort II: Pyramidal fracture

II a: Pyramidal and nasal fracture

II b: Pyramidal and NOE fracture

LeFort III: Craniofacial dysjunction

III a: Craniofacial dysjunction and nasal fracture

III b: Craniofacial dysjunction and NOE fracture

LeFort IV: LeFort II or III fracture and cranial base fracture

IV a: + Supraorbital rim fracture

IV b: + Anterior cranial fossa and supraorbital rim fracture

IV c: + Anterior cranial fossa and orbital wall fracture

Pterygoid

The pterygoid processes are not considered to be a component of the sphenoid bone, but rather as independent anatomical structures. It is possible to categorize every pterygoid process as fractured. In transition to the larger sphenoid wing, the frontal bone, and the temporal bone, the zygoma and its anatomical subregions form the lateral midface, which is attached to each side of the maxillary parts of the central midface pyramid. [22]

Palate

The premaxilla, the palatine processes of the maxilla, and the horizontal plate of the palatine bone compose together as palatal shelves. [21]

The palate is classified by Hendrickson's classification system.

Hendrickson's Classification of Palatal Fractures

Type I: Alveolar fracture

- Type I a: Anterior alveolus; contains only incisor teeth and associated alveolus
- Type I b: Posterolateral; contains premolars, molars, and associated alveolus

Type II: Sagittal fracture, a split of the palatal midline; typically occurs in second or third decade because of a lack of ossification of the midline palatal suture.

Type III: Parasagittal fracture; most common fracture pattern in adults (63%) because of thin bone parasagittally; fracture pattern differs from type Ia fracture by inclusion of maxillary canine

Type IV: Para-alveolar fracture; occurs palatal to the maxillary alveolus and incisors

Type V: Complex comminuted fracture; multiple fractured segments

Type VI: Transverse fracture, rare; involves a division in the coronal plane

Orbital fracture

Orbital roof fractures, lateral orbital wall fractures, medial orbital wall fractures, and orbital floor fractures are the four main forms of orbital fractures. In the affected side, the orbital contents protrusion, and the extent of rim involvement should all be noted while diagnosing orbital roof fractures. Since they are uncommon, lateral orbital wall fractures which are a component of LeFort III hemifractures or zygomaticomaxillary complex (ZMC) fractures should be noted. It is important to identify medial orbital wall fractures because they may have comminution into the rim, lacrimal bone, or orbital floor/roof involvement.[16] These may manifest singly or in conjunction with a naso-orbito-ethmoid (NOE) fracture. The orbital walls and orbital frame are the two subunits that make up the bony orbit which are composed of several bony elements with varying anatomical origins. Orbital roof fractures, lateral orbital wall fractures, medial orbital wall fractures, and orbital floor fractures are the four main forms of orbital fractures.[17]

Classification of orbital fractures

- Orbitozygomatic fractures (OZM), if impact is in malar bone
- Nasoorbitoethmoidal fractures (NOE), if central midface is affected
- Internal orbital fractures or orbital wall fractures (blowout, blow-in), only orbital walls without frames
- Combined orbital fractures, complete orbital bone is involved

Orbital rim

The orbital rim is classified in three functional segments: the naso-ethmoidal zygomatic (inferior and lateral rims), (medial rim), and the supraorbital (superior rim) segment building the orbital cavity quadrangular opening. Defects in the orbital wall are defined by a lack of bony support for the orbital contents due to the displacement of laminar fragments of the affected wall. Usually, the displaced bone only makes intermittent contact with the portion of the orbital wall that is not injured. Orbital fractures can be classified into two basic categories which are independent blow out fractures and those that are a component of a larger fracture pattern, such as nasoorbitoethmoidal complex, zygomaticomaxillary complex, and Le Fort fractures.[18]

In first type the inferior orbital rim is the most frequently fractured, which happens when one or more of the orbit's bony walls are injured, especially in the course of a larger fracture. The second kind of fracture, referred to as an orbital "blowout" fracture, is when the globe is directly struck by a traumatic impact and the force travels to the orbital floor, roof, or medial wall, pushing the globe outward and away from the orbit while the orbital rim itself stays intact.[19,20]

Naso-orbito ethmoidal Complex Fractures

The naso-ethmoidal complex fractures are classified by Markowitz – Manson, Yaremchuk, Rowe and Williams and Ayliffe.

The most usual form of facial fractures are nasal fractures. A nasal fracture is defined as one that affects the nasal bones, septum, or nasal process of the maxillary process. There is no standard classification system for nasal fractures, unlike many other facial

fractures, but they can be treated as either a bony, cartilaginous, or mixed injury.[9]

Injuries involving fractures of the nasal bone, medial orbital wall, and maxillary frontal process might affect the naso-orbito-ethmoidal complex. The naso-orbito-ethmoidal complex can be fractured by a high impact blow that strikes the nose anteriorly and passes through the ethmoid bone posteriorly. This can severely comminute both medial maxillary buttresses.

Common consequences in naso-orbito-ethmoidal complex fractures include telecanthus, exophthalmos, and cerebrospinal fluid leakage via the cribriform plate. It is frequently the case that other injuries like ocular and nasofrontal duct injuries are related[10,11].

Manson and Markowitz gave the first classification of NOE fracture based on the relationship of medial canthal ligament and the involved bone. They classified NOE into

Type I: Single fragment.

Type II: Comminuted with intact insertion of medial canthal ligament.

Type III: Comminuted with lateral displacement or avulsion of medial canthal ligament.

Yaremchuk provided a more comprehensive classification of NOE (naso-orbito-ethmoidal) fractures by including craniofacial injuries, lefort II and III fractures and oculo-orbital fractures.

Type I: Isolated bony NOE

Type II: Bony NOE and central maxilla

- Type II A:Central maxilla only
- Type II B:Central and unilateral maxilla
- Type II C:Central and bilateral maxilla

Type III: Extended NOE

- Type III A:With craniofacial injuries
- Type III B:With LF II and LF III

Type IV: NOE with orbital displacement

- Type IV A :With oculo orbital displacement
- Type IV B:With orbital dystopia

Type V: NOE with bone loss

Ayliffe classified NOE fractures into:

Type I: en bloc, minimally displaced fracture of the entire nasoethmoid complex

Type II: en bloc, displaced fracture, usually associated with a large pneumatized sinus and minimal fragmentation

Type III: comminuted fracture but canthal ligaments firmly attached with bone fragments that are big enough to plate

Type IV: comminuted fracture with free canthal ligaments not large enough to capture by bone plating

Type V: gross comminution needing bone grafting

Rowe and Williams also contributed classifying NOE fractures along with fronto-nasal fracture into

- Isolated nasoethmoid and frontonasal injury-without other fractures of the midface

a. Unilateral

b. Bilateral

- Combined nasoethmoid and frontonasal fracture with other fractures of the midface

a. Unilateral

b. Bilateral

Frontal sinus fractures

The frontal sinus wall is the thinnest portion of the frontal bone, it is usually involved in fractures affecting the upper third of the face. These fractures are categorized based on the degree of displacement and comminution of the fracture as well as whether the anterior wall, posterior wall, or both are involved.[20]

The frontal sinus fractures are classified by Stanley's and Gonty's classification system.

Type I: Anterior Table Fracture

- Isolated to anterior table

- Accompanied by supraorbital rim fracture
- Accompanied by naso-ethmoid complex fracture

Type II: Anterior and Posterior Table Fractures – It is a linear fracture either on transverse direction or in vertical direction

Type III: Comminuted Fractures – Isolated to both tables – Accompanied by naso- ethmoid complex fracture

Gonty's Classification:

Type 1 – fractures of the anterior wall Isolated to anterior table Associated with supraorbital rim fractures Accompanied by naso-ethmoidal complex fractures

Type 2 – anterior and posterior walls fracture

Linear fractures:

a. transverse
b. vertical

Comminuted fractures:

a. comprising both tables
b. accompanied by NOE fracture.

Type 3 – posterior table fractures

Type 4 – very severe comminuted fractures of the entire frontal area, involving the ethmoid bone, orbit, and nasal base.

Zygomaticomaxillary fracture

Essential to the understanding of Zygomatico maxillary complex fractures is that the zygoma has four articulations that can be disrupted. In a true ZMC fracture more than one of the sphenoid, temporal, frontal, or maxillary articulations is affected. "Orbital floor fracture, lateral orbital wall fracture, zygomatic arch fracture, and anterior maxilla fracture" is a commonly occurring types.[13] In terms of overall frequency, zygomaticomaxillary complex fractures (ZMC) are second only to nasal bone fractures. The ZMC fracture, often known incorrectly as the "tripod" fracture, is caused by a direct blow to the malar eminence and involves breakage at four different sites: the zygomatic arch, the zygomaticomaxillary buttress, the inferior orbital rim, and the lateral orbital rim. All four zygomatic sutures are disrupted by the ZMC fracture.[14,15]

The zygomaticomaxillary complex fractures are classified using Knight and North classification, Rowe and Killey classification, Larsen and Thomson classification and Zing's classification system

Knight and North classified ZMC fractures in 1961 into

Group I: Undisplaced fractures

Group II: Arch fractures.

Group III: Unrotated body fractures

Group IV: Medially rotated body fractures.

Group V: Laterally rotated body fractures.

Group VI: Complex fractures

ROWE AND KILLEY in 1968 classified fractures based on the displacement into

Type I: No significant displacement

Type II: Fractures of the zygomatic arch

Type III: Rotation around the vertical axis

- Inward displacement of orbital rim
- Outward displacement of orbital rim

Type IV: Rotation around the longitudinal axis

- Medial displacement of the frontal process
- Lateral displacement of frontal process

Type V: Displacement of the complex en bloc

- Medial
- Inferior
- Lateral (rare)

Type VI: Displacement of the orbitoantral partition

- Inferiorly
- Superiorly (rare)

Type VII: Displacement of orbital rim segments

Type VIII: Complex comminuted fractures.

Based on the stability of fractures Larsen and Thomson classified ZMC into:

1. Group A : Stable fracture
2. Group B : Unstable fracture
3. Group C : Stable fracture - Other types of zygomatic fractures, which requires reduction, but no fixation

ZING classified ZMC based on the number of buttresses

Type A: is associated with one component of the tetrapod structure.

- Zygomatic arch alone
- Fracture of lateral orbital wall
- Fracture of inferior orbital rim

Type B:

- This type of fracture involves all 3 buttresses. Also known as Tripod fracture.
- Have to be treated by two point fixation / three point fixation techniques.

Type C:

- These are comminuted fractures involving zygoma

Alveolar process

The most prevalent type of fracture pattern is seen in alveolar process. These fractures, which are caused by an impact on the teeth below either by the base of the dental crown or by direct force on the alveolar process, which require surgical debridement along with preventive antibiotics to prevent oral cavity bacterial infection.[23]

The alveolar ridge of any edentulous portion in the anterior and posterior maxilla will be gradually resorbed and remodeled with subsequent reduction of height. The fractures involved tooth avulsion, crown or root fracture, tooth loosening. Alveolar process fractures are documented similarly to the mandible.

Sanders Et Al classified dentoalveolar fractures into:

1. Crown Craze or Crack (i.e. infraction)
2. Horizontal or Vertical Crown Fracture
3. Crown-Root Fracture
4. Horizontal Root Fracture
5. Sensitivity (i.e. Concussion)
6. Mobility (i.e. Subluxation or Looseness)
7. Tooth Displacement
8. Avulsion
9. Alveolar Process Fracture

Mandible

The mandible is the most frequently fractured bone after the nasal bones; open reduction is frequently necessary for mandibular fractures. The mandible is a U-shaped bone that resembles a ring and is joined to the cranium through the temporomandibular joints. Due to this ring-like structure, a blow to the jaw typically causes two or more distinct fractures. When a mandibular fracture is seen alone, it typically results from a fracture-dislocation complex that causes the temporomandibular joints to move.[24]

In severe situations, the most severe kind of atrophy known as "pencil bone condition" will result in full edentulism. The terms “alveolar fracture,” “alveolar process fracture,” or “alveolar ridge fracture” are used synonymously An alveolar process is the upper bone component of the mandibular arch that surrounds and supports the teeth closely. It is made up of several sockets arranged in a continuous row. A dental alveolus is a tooth socket. A fracture segment that is bounded by an interconnected horizontal fracture line that passes through the apical base and by two separate vertical fracture lines that are spaced apart at varying distances is known as an alveolar process fracture. The degree and variety of the bone's shattering into pieces, or "fragmentation," might indicate how severe a fracture is. The word "fragmentation" is frequently used synonymous with "comminution," or breaking the bone into fragments. Here, the term "fragmentation" refers to the general look, pattern, and characteristics of one or more fracture lines at a specific fracture site.[25,26]

The mandibular fractures are classified by Dingman and Natvig, Rowe and Killey, Kazanjian and Converse, Kruger Et Al classification, based on the favorability of fractures, FLOSID classification and Kelly and Harrigan classification.

Dingman and Natvig classified mandibular fractures based on the anatomical location into

1. Midline
2. Parasymphyseal
3. Symphysis
4. Body
5. Angle
6. Ramus
7. Condylar process
8. Coronoid process
9. Alveolar process

Rowe and Killey in 1968 classified mandibular fractures based on the involvement of basal bone into:

1. Those not involving basal bone and
2. Those involving basal bone. It was further divided into:

- Single unilateral
- Double unilateral
- Bilateral
- Multiple

In 1974 Kazanjian and Converse classified mandibular fractures based on presence or absence of teeth

Class I: Teeth are present on both sides of the fracture line.

Class II: Teeth are present on only one side of the fracture line.

Class III: The patient is edentulous.

Kruger et al attempted to give a comprehensive classification based on various criteria

1. Relation to the external environment

a. Simple or closed
b. Compound or open

2. Types of fractures

a. Incomplete
b. Greenstick
c. Complete
d. Comminuted

3. Dentition of the jaw with reference to the use of splints

a. Sufficiently dentulous jaw
b. Edentulous or insufficiently dentulous jaw
c. Primary and mixed dentition

4. Localization

a. Fractures of the symphysis region between the canines
b. Fractures of the canine region
c. Fractures of the body of the mandible between the canine and angle of the mandible
d. Fractures of the angle of the mandible in the third molar region
e. Fractures of the mandibular ramus between the angle of the mandible and sigmoid notch
f. Fractures of the coronoid process
g. Fractures of the condylar process

Based on the radiographic assessment of the direction of fracture line and the effect of muscle pull, the mandible can be classified into

- Vertically favorable or unfavorable
- Horizontally favorable or unfavorable

Shetty et al – FLOSID classification [30]

1. Fracture type (F)

a. Incomplete
b. Simple
c. Comminuted
d. Bone defect

2. Location of fracture (L)

a. Left from midline (L1) to condylar head (L8)

b. Right from midline (R1) to condylar head (R8)

3. Nature of occlusion (O)

a. Normal

b. Malocclusion

c. Edentulous

4. Extent of soft tissue damage (S)

a. Closed

b. Open intraorally

c. Open Extraorally

d. Open intra and extraorally

e. Soft tissue defect

5. Presence of infection (I)

a. Yes

b. No

6. Radiographic analysis of interfragmentary displacement (D)

a. Mild

b. Moderate

c. Severe

Kelly and Harrigan categorized mandibular fractures into six categories for simplification in classification

- Symphysis
- Body
- Angle
- Ramus
- Condylar process
- Coronoid process

Atrophic mandibular fractures are classified into

- Luhr Class I: Mild atrophy, with a vertical height of 15–20 mm
- Luhr Class II: Moderate atrophy, with a vertical height of 10–15 mm
- Luhr Class III: Severe atrophy, with a vertical height of 10 mm or less

Condylar process

The angle/ramus region is affected by fractures that extend from the condylar process or the inner angle of the mandible (third molar). The adjacent angle/ramus is oblique and extends inferiorly and posteriorly from the masseteric tuberosity notch to the lowest point of the mandibular notch. The ramus can compromise its bony connection along this borderline in the course of a condylar process fracture; however, the angle/ramus region is assigned to the fracture if the fracture line departs the ramus below the masseteric tuberosity notch.[25,27,28]

The condylar fractures can be classified as Rowe and Killey classification, Speissel and Schroll classification, Wassmund's classification, Thoma classification, Neff and Rassey's modification, Lindahl classification, R.A. Loukota Et Al classification.

Rowe and Killey classified condylar fractures based on the level of fracture

- Intracapsular Fractures or High Condylar
- Extracapsular or Low Condylar Fractures
- Fractures associated with injury to the capsule, ligament and meniscus
- Fractures involving adjacent bone

Speissel and Schroll classified condylar fractures into

- Nondisplaced fracture
- Low neck fracture with displacement
- High neck fracture with displacement
- Low neck fracture with dislocation
- High neck fracture with dislocation
- Head fracture

In 1934 Wassmund classified condylar fracture into

Type I- The angle between the head and the long axis of the ramus: 10 to 45 degrees.

Type II- angle of 45 to 90 degrees, resulting in tearing of the medial portion of the capsule

Type III- the fragments are not in contact, and the head is displaced mesially and forward owing to traction of the lateral pterygoid muscle confined to within the glenoid fossa.

Type IV- fractures where the condylar head articulates in an anterior position to the articular eminence.

Type V- vertical or oblique fractures through the head of the condyle

Based on displacement of fracture segments Thoma in 1948 classified condylar fractures into

- Fracture with displacement
- Fracture without displacement
- Fracture with dislocation
- Fracture dislocation with complete displacement

In 2006 Neff and Rasse modified condylar fracture into: [31]

- Type A: Displacement of medial condylar pole with preservation of the vertical dimension
- Type B : The lateral condylar pole is involved with loss of the vertical dimension
- Type C : dislocation of the entire condylar head

Lindahl in 1977 classified condylar fracture into

Anatomic location of the fracture

- Condylar head
- Condylar neck
- Subcondylar

Relationship of condylar fragment to mandible

- Nondisplaced
- Deviated
- Displacement with medial or lateral overlap
- Displacement with anterior or posterior overlap
- No contact between fractured segments

Relationship of condylar head & fossa

- Nondisplaced
- Displacement
- Dislocation

R.A Loukotaa Et Al classified condylar fracture into [32]

- Di capitular fracture (through the head of the condyle)
- Fracture of the condylar neck:
- Fracture of the condylar base

Conclusion

To ensure proper treatment planning and anticipate potential complications, maxillofacial surgeons require detailed information about the anatomical landmarks and key aspects of the fracture, including the extent of displacement and comminution, as well as the various fracture classifications. Recognizing common patterns of maxillofacial fractures is essential, as each pattern may be associated with distinct functional challenges. Various classification systems described in this narrative review directs the clinicians and researchers to develop a comprehensive craniomaxillofacial trauma classification that includes all the bones of this region. This can be attributed due to the paradigm shift from low velocity to high velocity injury due to which distinctive fracture patterns are uncommon these days.

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