LESSON № 4 Traumatology of maxillofacial area

Anatomy

- The face is composed of 14 bones:
  - Mandible (1)
  - Vomer (1)
  - Maxilla (2)
  - Zygomata (2)
  - Nasal (2)
  - Lacrimals (2)
  - Palatines (2)
  - Inferior Nasal Conchae (2)

The Mandible

- Lower jaw bone
- Strongest facial bone
- Articulates with the temporal bone
- Contains foramens for the passage of nerves and blood vessels to the face

The Maxilla

- Paired
- Form the upper jawbone
- Articulates with every other facial bone except the mandible
- Contains the maxillary sinuses
- Forms the inferior floor of the orbits
- Contains a foramen to allow passage of the maxillary/infraorbital nerve

The Zygomata

- Paired
- Form the “cheekbones”
- Articulate with the temporal, frontal, and maxillary bones
- Their prominent position and shape renders them susceptible to injury

Fracture

- Zygomatic
- Maxilla
  - LeFort I
  - LeFort II
  - LeFort III
- mandibular

Symptoms of fractures

1. Local pain
2. Local bleeding
3. Local swelling
4. Deformity or dislocation
5. Symptoms of associated nerve damage:
   a. Numbness
Paralysis
6. Loss of pulse below fracture

Zygomatic Fractures

- cause: Blunt Force
- Signs, symptoms:
  - Pain
  - Numbness of the cheek, infraorbital region & upper teeth on injured side
  - Eyelid swelling
  - Inability to close mouth properly
  - Swelling, Edema, Ecchymoses
  - Flattened cheekbone
  - Palpable depression at fracture site
- Treatment: Reduction & fixation

Maxillary Fractures

- Complex, Bilateral fracture that have an unstable “floating” fragment.
- Classified as LeFort I, II, or III based on the plane of the fracture.
  - LeFort I – Transmaxillary
  - LeFort II – Pyramidal/Subzygomatic
  - LeFort III – Craniofacial

  LeFort I:
  Transmaxillary

- The fracture occurs along the nasal and maxillary floor
- Almost always involves the pterygoid process of the sphenoid bone
- May involve the maxillary sinuses
- The resultant “floating” component is the lower part of the maxilla and its teeth

  LeFort II:
  Pyramidal/Subzygomatic

- Result from a downward force on the nose
- The fracture runs from the peak of the nasal bone laterally beneath the orbits.

  LeFort III: Craniofacial

- Most severe
- Often associated with extensive soft tissue injury
- Large force is necessary to cause this type of fracture
- The resultant “floating” component is virtually the entire face

Mandibular Fractures

The mandible, or lower jaw, is the most frequent site of fracture on the face. Even though it is a very strong bone, its prominent position on the face makes it particularly vulnerable. Mandibular fractures can cause serious swelling, they can inhibit movement in the jaw, and they can cause changes in the contour and structure of the jaw (for example, a change in the alignment of the teeth). One of the main aspects of treating a broken jaw involves making sure the alignment of the teeth returns to normal.
The fracture can occur at different parts of the bone, depending on what angle the mandible has been impacted. Also, because of the mandible's rounded shape, a traumatic injury may cause the mandible to fracture in more than one place.

<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condylar neck</td>
<td>35%</td>
</tr>
<tr>
<td>Angle</td>
<td>20%</td>
</tr>
<tr>
<td>Body</td>
<td>20%</td>
</tr>
<tr>
<td>Parasympysis</td>
<td>13%</td>
</tr>
<tr>
<td>Symphysis</td>
<td>11%</td>
</tr>
<tr>
<td>Coronoid</td>
<td>1%</td>
</tr>
</tbody>
</table>

- Involved in ~ 2/3 of all facial fractures
- Fractures are classified as open or closed:
  - Open: With a break in the skin or mucosa
  - Closed: No break in the skin or mucosa
- Described as:
  - Oblique
  - Transverse
  - Comminuted
  - Greenstick
- Signs, symptoms:
  - Pain
  - Malocclusion
  - Excessive salivation
  - Dysphagia
  - Swelling
  - Crepitation
  - Discoloration
  - Deformity

**Physical Examination**

- Symmetry/Deformity
- Lacerations/Abrasions/Ecchymoses
- Palpable step deformities
  - Orbital rims
  - Zygomatic arches
  - Nose
  - Frontal Bones
  - Mandibular borders
- Movement of dental arches
- Fractured/Avulsed/Mobile teeth
- Visual disturbances
  - Diplopia
  - Reflexes
  - Extraocular muscle function
  - Acuity
  - Fields
- Intranasal Inspection
  - Hematoma
- Airway Obstruction
- CSF rhinorrhea
- Facial movement (including jaw excursions)
- Facial sensation

Radiographic Examination

**Treatment**

**Treatment Principles**

1. Debridement
2. Reduction—open/closed
3. Fixation—internal/external
4. Immobilisation
5. Functional rehabilitation

The general procedure for treating a fractured mandible is first to immobilize the jaw and set the break - this is called "reduction." Often, a surgeon can set the bone simply by manually repositioning it - this is called "closed reduction" because it can be done through the skin and does not involve major surgery. Once the bone is set, the jaw must be stabilized and kept stationary for a period of time, to allow the broken segments to grow back together. This process, called "fixation," may involve wiring the jaw shut for two to six weeks.

In more complex mandibular fractures, setting the bone might require "open reduction." This means surgically exposing the bone and re-positioning the fractured pieces with the use of small screws and plates that are attached directly to the bone. These plates and screws then act to stabilize the jaw during the healing process, as the bones grow back together.

Regardless of the kind of fixation technique used, patients recovering from a broken mandible will have to maintain a liquid or soft diet for some time after the injury - depending on the fracture, this might be from one to six weeks.