Complex Facial and Orbital Trauma

“What you need to know, and what you need to look out for.”


**Introduction**

- Facial and orbital injuries are a common and serious consequence of RTIs, assaults, falls and other blunt trauma.
- The incidence of traumatic facial and orbital injuries is increasing, as the age of the general population increases.
- Facial and orbital fractures are associated with significant levels of mortality and morbidity.
- CT and MRI imaging are essential for the diagnosis and treatment of facial and orbital injuries.
- The aim of this poster is to review the anatomy of the facial bones, identify common fracture patterns, and alert the reporting radiologist to specific complications related to these fractures.

**Le Fort Classification**

- René Le Fort was a French military surgeon who, in 1901, developed his classification by applying varying degrees of blunt force to the faces of cadavers.
- A Le Fort fracture is a separation of all or a portion of the maxilla from the skull base.
- Disruption of the posterior vertical maxillary buttress – at the junction of the posterior maxillary sinus and the pterygoid plates of the sphenoid – is common to all Le Fort fractures.
- Any combination of Le Fort fracture can occur.

**Zygomatico Maxillary Complex (ZMC) Fractures**

- The ZMC is a quadripod structure – which borders the frontal, temporal, maxilla and sphenoid bones.
- A ZMC fracture usually fractures through all four sutures of the complex.
- In very high impact trauma, Le Fort, ZMC and NOE fractures can be concomitant.
- ZMC fractures often increase orbital volume by angulation of the lateral orbit wall at the zygomaticosphenoid suture – a “blow-out” of the orbital floor. In this context, the reporting radiologist must carefully scrutinize the globe to assess its integrity.

**Mandibular Fractures**

- A traumatic force to the mandible typically produces at least two fractures, due to its half ring-like structure.
- Alveolar ridge fractures must be treated as open fractures and the patient should be commenced on an appropriate antibiotic regimen.

**Naso Orbito Ethmoid (NOE) Fractures**

- NOE fractures are classified by degree of injury to the medial canthal attachment.
- The radiologist’s report should comment on the degree of comminution of the medial vertical maxillary buttress, where the medial canthus attaches to the bones of the medial orbital rim.

**Injuries to the Lens and Intracanal Haemorrhage**

Blunt trauma to the eye results in deformation of the globe and typically displaces the cornea and anterior sclera posteriorly, with the globe expanding in a compensatory fashion in an equatorial direction.

**Intraorbital Foreign Bodies**

- The detection and localization of intraorbital foreign bodies is an important task for the radiologist.
- CT is sensitive and is usually the first imaging test performed.

**Putting it All Together**

- A radiologist must have a comprehensive knowledge of facial fracture patterns and their sequelae.
- Diagnosis, and subsequent surgical management, is vitally important to prevent serious functional impairment, as well as cosmetic deformity.
- When assessing the extent of orbital trauma the reporting radiologist must:
  - Assess the bony orbit for fractures, and search for herniations of orbital contents.
  - Evaluate the anterior chamber and position of the lens.
  - Evaluate the posterior chamber, searching for bleeds, fluid collections and abnormal bodies.

**References**