Zygomaticomaxillary complex fracture

- The Orbital Destruction Intensity Classification-An Easy-to-Use, Numerical Scale for Assessing the Severity of Orbital Fractures
- Clinically Guided Virtual Surgical Planning for Zygomatic Repositioning in Post-Traumatic Residual Deformities: A Technical Note
- Integrating Virtual Planning and three-dimensional Printing for Craniofacial Trauma Management
- Upper Blepharoplasty and Lateral Brow Approaches for Zygomaticomaxillary Complex Fractures
- Advances in facial fracture care in patients with zygomaticomaxillary complex fractures
- Retrospective Study for Intraoral Approach for Zygomaticomaxillary Complex and Orbital Floor Fracture
- Augmented Reality Navigation in Craniomaxillofacial/Head and Neck Surgery
- Pediatric orbital fractures in Singapore: demographics, etiology, and the role of bioresorbable implants

Zygomaticomaxillary complex (ZMC) fractures, also known as tripod, tetrapod, quadripod, malar or trimalar fractures, are seen in the setting of traumatic injury to the face. They comprise fractures of the:

zygomatic arch

inferior orbital rim, and anterior and posterior maxillary sinus walls

lateral orbital rim

Epidemiology

They can account for ~40% of midface fractures. They are the second most common facial bone fracture after nasal bone fractures.

Pathology

The fracture complex results from a direct blow to the malar eminence and results in three distinct fracture components that disrupt the anchoring of the zygoma. Additionally, the fracture components may result in impingement of the temporalis muscle, trismus (limited jaw mobility) and may compromise the infraorbital foramen/nerve resulting in hypoesthesia (numbness) within its sensory distribution.

Radiographic features

On radiographic evaluation, typically with dedicated CT imaging with multiplanar reformats, the following three fracture components are generally identified:

fracture of the zygomatic arch and/or diastasis of the temporozygomatic suture

fractures of the inferior orbital rim and anterior and posterior maxillary sinus walls and/or diastasis of the zygomaticomaxillary suture

fracture of the lateral orbital rim and/or diastasis of the frontozygomatic suture

Treatment and prognosis

If needed, closed or open reduction methods can be performed with the goal of treatment being preservation of normal facial structure, sensory function, globe position and mastication functionality.

Case report from HGUA

Multiple comminuted left craniofacial fractures.

Skull fractures: left parietal, temporal, and frontal bones, with herniation of brain parenchyma through them. Soft tissue hematoma in the left facial region with scalp involvement in the temporal and parietal regions. Fractures of the left zygomaticomaxillary complex: zygomatic arch, anterior and posterior walls of the maxillary sinus, frontal sinus fracture and hematosinus. Also associated with subcutaneous emphysema adjacent to the fractures.

Sphenoid bone fracture with involvement of both sinus walls, noting a fracture line in the clivus extending to the carotid canal.

Longitudinal and oblique fracture of the left petrous part, extending to the anterior wall of the external auditory canal (CAE)

The left orbital wall fracture is associated with inferior and lateral displacement of intraorbital contents, with herniation of extraconal fat into the maxillary sinus and slight displacement of the inferior rectus, without thickening of the same.

Zygomaticomaxillary complex fractures: Fractures of the left zygomaticomaxillary complex with inferolateral displacement: zygomatic arch, anterior and posterior walls of the maxillary sinus, with involvement of the frontal sinus and hematosinus.

Skull base fractures affecting the body, walls of the sinuses, and greater wing of the left sphenoid bone, noting a fracture line in the clivus extending to the carotid canal.

Longitudinal fracture line affecting the petrous part with probable incudomalleolar subluxation and hemotympanum, continuing with a fracture line of the greater wing of the sphenoid bone.