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Review Article

Zygomaticomaxillary Complex Fracture as an Orbital Wall Fracture

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ABSTRACT

Zygomaticomaxillary complex (ZMC) fracture is common and refers to the osseous disruption of the malar eminence at its 4 buttresses: frontozygomatic, zygomaticomaxillary, zygomaticosphenoid, and zygomaticotemporal. So, ZMC fracture is considered orbital wall fracture. In this work, I increase orientations to the recent trends to properly manage such orbital wall fracture.

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Zygomaticomaxillary complex (ZMC) fracture is common, involved in approximately 42% of facial fractures and represents more than 60% of all middle third fractures [1-5]. ZMC fracture refers to the osseous disruption of the malar eminence at its 4 buttresses: frontozygomatic, zygomaticomaxillary, zygomaticosphenoid and zygomaticotemporal (zygomatic arch) [4]. Thus, ZMC fracture is considered as a type of orbital wall fractures because the lateral orbital wall and orbital floor are important walls that could be affected by such fractures.

The most frequent signs of ZMC fractures are step deformity of orbital bony margin (100%), flattening of the cheek (94%), periorbital ecchymosis (90%), facial asymmetry (86%), facial oedema (82%), epistaxis (68%) and subconjunctival ecchymosis (52%) [6].

Particular attention should be given to the eye examination when ZMC fractures are suspected. The anterior and posterior segments of the eye should be assessed, along with evaluation of optic nerve function and ocular motility. Visual field defects decreased visual acuity, abnormal pupillary response, or impaired perception of red colour saturation is likely indicative of an optic nerve injury. Although uniformly limited mobility may occur secondary to diffuse orbital edema, restricted

movement in a vertical orientation is caused by inferior rectus entrapment. Forced duction testing is mandatory in unconscious patients, along with pupillary reflex evaluation. Urgent ophthalmological consultation should be obtained in cases have post-trauma diminished visual acuity, abnormal optic nerve findings, severe conjunctival hemorrhage, obvious corneal or globe injury, hyphema, or entrapped foreign body [7].

Computed tomographic (CT) scans (1 to 2 mm slices) from the mentum to the vertex is the standard diagnostic radiology better with 3DCT reconstruction [4]. ZMC fractures could be treated by observation, closed reduction without fixation or open reduction and rigid internal fixation (OR/IF) at 1 or more ZMC buttresses. One of the most standardized methods for treating ZMC fractures is OR/IF [1, 3-5]. Most ZMC fractures (77% to 94%) are surgically repaired [2, 4].

Transconjunctival approach for repair of the inferior orbital rim and orbital floor as part of OR/IF of ZMC fractures consume more operative time and mostly needs lateral canthotomy for proper fracture exposure and repair that not needed with subciliary approach. However, transient postoperative edema is more severe in transconjunctival approach, but the post-operative ectropion and sclera show is only reported with subciliary

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approach. So, upgrading the surgical experience in transconjunctival approach is beneficial for the maxillofacial surgeons [5].

Although 3 point fixation technique is the conventional standard fixation technique of ZMC fracture, 2 points fixation is as effective as 3 points in fixation and prevents post-reduction rotation or clinical displacement with significantly lower cost even with some asymptomatic and clinically unnoticeable radiological difference [5, 8]. Exploration and repair of orbital floor must be conducted during OR/IF of ZMC fractures associated with limited upward gaze.

ZMC fractures significantly reduce muscular activity of the masseter and temporalis muscles that showed significant recovery of muscle activity 6 weeks after repair but this muscle activity remain less than normal activity, reflecting the importance of the postoperative rehabilitation that help to maintain muscle power affecting facial and lid contour [2].

In spite of disruption of the ZMC bones by its fractures, infraorbital foramen lies just lateral to a line between the anterior nasal spine and Whitnall's tubercle (clinically nasal tip – lateral canthal ligament line) and lateral to the root of maxillary canine. These fixed reliable landmarks help to avoid mental nerve injury during OR/IF of ZMC fractures [9].

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