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# MANAGEMENT OF ZYGOMATICOMAXILLARY APPARATUS FRACTURE IN A CONSERVATIVE MANNER - A CASE REPORT

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## *ABSTRACT*

*Most common oral and maxillofacial trauma accounts for zygomaticomaxillary complex. The consequences include flattening of the face resulting in increased facial width1,2,3,4,5. Our case report mentions the importance of conservative management of left ayngomaticomaxillary complex fracture comprising of maxilla, zygoma and zygomatic arch.*

***KEYWORDS:*** *Oral, Dental, Trauma Maxillofacial, Zygoma, Conservative*

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## INTRODUCTION

### Case Report

A middle aged male patient of about 48 years complained of pain and trismus since one day of a road traffic accident with a history of haemoptysis. On clinical examination, swelling along with lacerations, abrasions and contusions were seen on the left facial area followed by facial flattening, increased facial width, subconjunctival haemorrhage, diplopia, haematoma in relation to lateral orbital region extraorally. Intraorally, the features included malocclusion, ecchymosis and dentoalveloar fracture in conjunction with tenderness and crepitation (Figure 1,2). Three dimensional computed tomography (3D facial CT) revealed zygomatico-maxlillary complex fracture. (Figure 3,4,5). Undisplaced fractures were seen leading to the final decision of conservative management followed by dental treatment.

## MANAGEMENT

Management of oral and maxillofacial trauma includes open method and closed method. If the fracture line is displaced open reduction and internal fixation are preferred[6,7,8,9,10]. Functional and aesthetic correction is of utmost importance. Aesthetic concerns are of flattening of the alar region or creation of a concavity in the area of interest. Functional corrections are of trsimus, malocclusion and restriction of ophthalmic function11,12,13,14,15.

Un displaced fractures might result in sub conjunctival haemorrhage, oedema in the periorbital region, ecchymosis and pain. Depression of eminence in the malar region rim of the infraorbital region occurs in case of displaced fractures. Maxillary anterior teeth, upper lip, lateral region of nose and cheek exhibit anaesthesia or paraesthesia in case of damage to nerves in the infraorbital region and zygomaticotemporal region. Fractures of the zygomatic region exhibit diplopia and epistaxis. Fractures of orbit including floor, medial wall and lateral wall result in limitation of motion in relation to extraocular muscles, enopthalmos and exophthalmos. Ophthalmologist opinion plays an important role in such fractures.

Impingement on the master muscle and muscular process of the mandible result from the medial collapse of fragments in an M shaped pattern in case of isolated fracture of the zygomatic arch. Displaced segments might press against the coronoid process followed by a spasm of masseter muscle in case of displacement of the medial part of the zygomatic arch. A fracture of ZMC might get displaced inferomedially or might end up in an isolated fracture of the zygomatic arch due to the application of direct force in the lateral direction. Fracture fragments might get displaced in an inferoposterior direction after the application of force in the frontal plane. Palpation is of more ease in case of the absence of oedema in case of margins of inferior orbit, superolateral orbit, extraoral steps like deformities of the zygomatic arch and intra oral steps like deformities of the zygomaticomaxillary buttress. In oral and maxillofacial radiology, the buttress of the midface is visualised in an excellent manner by coronal and axial CT slices. Relationship between rotated and displaced fracture segments pertaining to surrounding bony structures is obtained by three dimensional radiography. Earlier, ZMC fractures were viewed by plain radiography via the Waters and Caldwell method. Projection in the malar region and zygomatic arch can be evaluated via submnetovertex earlier. The outer facial frame needs to be built up resulting in the reconstruction of the facial load bearing apparatus. Fixation points play an important role in ZMC fractures. Miniplates are of utmost importance in ORIF management. There is no specific protocol for the management of ZMC fractures. Dissimilarities are witnessed between various specialities involved in the management of ZMC fractures. In case of cases with nil displacement of fracture segments, conservative management is preferred followed by a soft diet for two to six weeks. In case of displaced fracture with involvement of enopthalmos, open reduction and internal fixation are recommended. In the initial days, wires were used for osteosynthesis which was ineffective when compared to the plating system. Biomechanical studies emphasise three-point fixation. A step-wise process was initiated by Ellis and Kittidumkerng. Iatrogenic deformities result from unnecessary surgical procedures. Skeletal fixation should be achieved by minimising soft tissue morbidities such as ectropion and lower cheek descent. The type of fracture and the surgeon's opinion determine the number of soft tissue approaches and buttresses. Wide exposure and fixation are needed in case of comminuted fractures. Subtarsal, subciliary and transconjunctival approaches utilise the lower eyelid to expose the infraorbital rim and orbital floor. Lateral brow incision and upper blepharoplasty are done to access the zygomaticofrontal suture. Zygomatic buttress can be reached via intraoral approach in the gingivolabial sulcus. Scarring might result from a brow incision. Ectropion or entropion can result from lower eyelid exposures. Ptosis of the malar region might result from inadequate resuspension. Severe cases can be treated by coronal approach by exposing the zygomatic arch and lateral orbital rim. Postoperative complications include scalp necrosis, facial nerve injury, alopecia and temporal fat pad injury. An upper blepharoplasty incision is needed for zygomaticofrontal suture. The most favourable incision for the transconjunctival approach is the lower eyelid incision.

Immobilization can be done at five points zygomatic arch, zygomaticofrontal suture, zygomatic buttress, inferior orbital rim and zygomaticosphenoid suture. Absorbable plates are used because of the absence of plate palpability and infection even though they are not as strong as titanium plates. Position of periorbital soft tissues, reconstruction of orbit, stabilization and reduction are four important factors to be considered in the management of ZMC. Restoration of lost anatomical configuration, and spontaneous habitual function followed by prevention of cosmetic deformities and late visual disorders is of utmost importance. In order to achieve stability so that zygomatic bone rotation can be prevented, one or two point stability can be achieved with the help of plates and screws. Even after the application of fixation devices, the stability of the repositioned region is determined by using digital pressure. After a minimum postoperative period of six months, the biting force can be assessed by maximum voluntary clench which determines the master function in relation to

the zygoma and temporalis muscle. Postoperative distraction in relation to frontozygomatic suture might be due to forces exerted by the temporalis muscle. In order to prevent post reduction displacement which can be due to increased muscle activity at the frontozygomatic area, a rigid fixation is much more important. Medial rotation of ZMC into to maxillary sinus can be prevented by fixing the ZMC buttress. The greater wing of the sphenoid is the key area for alignment. Stabilization of ZMC can be achieved at the frontozygomatic or frontozygomatic buttress region. One point or two point fixation can be achieved resulting in three-dimensional stability in the case of quadruped fractures. Mandibular movements, EMG activity and bite force are prime factors. Postreduction displacement of zygomatic fractures relies mostly on masseter muscle. The majority of ZMC fractures stabilize on the frontozygomatic suture site and zygomaticomaxillary buttress region. Aesthetics and function are of utmost importance as they depend upon the fracture reduction accuracy. Earlier, zygomatic reduction forceps, Carroll Girard screws and zygomatic hooks were used. Increased orbital volume, anomalies in the bony contour, downward slanting of eyelids, facial asymmetry and depressed malar eminence are post operative complications. Intraoral incision is the only incision that leaves no scar. Denervation of tarsal plate muscle fibers might happen in subciliary incision, leading to ectropion, increased scleral show and lid shortening. Skin incision can be closed by resuspension of the lateral canthal ligament. A coronal flap is planned to access zygomaticoorbital fractures. Weakness of the temporal branch of the facial nerve, bleeding and alopecia are witnessed in the implementation of a coronal approach for comminuted fracture of the lateral orbital wall. Decreased complications are encountered in incisions pertaining to upper eye lid blepharoplasty and lateral eye brow. Complications include subconjunctival haemorrhage, diplopia, ecchymosis and decreased visual acuity including: diplopia, decreased visual acuity, ecchymosis, and subconjunctival hemorrhage. Various methods available for the management of ZMC fractures are closed reduction, and osteosynthesis with miniplate and biodegradable materials. During the reduction of fracture segments of ZMC, CT evaluation is to be done intraoperatively. In case of exposure of zygomaticomaxillary, inferior orbital rim and zygomaticofrontal suture, two or three incisions are planned. Factors involved in the inspection of post closed reduction of ZMC fractures are visible reduction, loud click followed by palpation which reveals the absence of depression of the zygomatic arch, malar prominence displacement and bone slide on the rim of the lower orbital region. The main advantages are shorter duration, scar of aesthetically acceptable limits, decreased complications in relation to inflammation and low costs. Inclusion criteria are multiorgan trauma, high risk surgery, terminally ill patients, displacement of fractures bone fragments in posterior and inferior directions, single fragment of fractures in relation to zygoma devoid of ophthalmic disturbances and also isolated fractures of zygomatic arch. Early treatment leads to earlier recovery resulting in excellent outcomes in relation to function and aesthetics[16,17,18,19,20]. Delayed approach results in facial deformity leading to social stigma[21].

Figure 1,2: Clinical View

Figure 3: Axial View

Figure 4: 3D Facial Reconstruction

**Figure 5: Coronal View**

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