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A case report on isolated Zygomatic complex fracture

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Abstract
Zygomatic bone is situated at the lateral part of the facial triangle, and is frequently exposed to maxillofacial traumas. It is the most prominent region of the facial skeleton. Isolated zygomatic arch fractures comprise 5% off all facial fractures and 10% of Zygomatic bone fractures. In this case report, the clinical and radiological characteristics, and management of isolated zygomatic arch fracture have been discussed.

Keywords: Zygomatic fractures, zygomatic arch, zygoma

Introduction
The integrity of the zygoma is critical in maintaining normal facial width and prominence of the cheek. Sicher and DeBrul were the first to depict facial anatomy and recognize the structural pillars or buttresses of the facial skeleton.[1] Several buttresses about the zygoma to three major bone units in the face—the temporal bone, the frontal skull, and the maxilla—giving the best architectural and stress-bearing functional struts, which can transmit force in different directions, protecting the eye and the brain. These buttresses also give the zygoma an intrinsic strength such that blows to the cheek usually result in fractures of the zygomatic complex at the suture lines and, less commonly, the body of the zygomatic bone. Studies on the incidence of zygoma fractures have shown that road traffic accidents (RTAs; 31%) and assaults are the commonest causes of zygomatic complex fractures. Mostly zygomatic Complex Fracture was managed by open reduction and internal fixation of zygomatic complexes including with the closed reduction.

Case History
A 34 Years old male patient presented to Accident and come to Department of Trauma and Emergency in a Tertiary Care Hospital in Odisha at around 3AM with Multiple facial injuries associated with RTA. As per patient's history, he collided with another motorbike and was not wearing a helmet at the time of accident. Patient known history of alcohol intake and also history of nasal bleeding. On Clinical Examination, he had swelling on right zygomatic region and 5cm laceration from the nasal bone to right Fronto-zygomatic suture. The right zygoma was tender on palpation and associated with depression of zygomatic arch region. Infraorbital paresthesia was present on the right side. Trimus was moderate and no significant previous medical history.

Fig 1: Case of zygomatic complex fracture

Investigation

The Patient was advised for NCCT brain, CT face with 3D reconstruction and routine laboratory investigations. A detailed clinical and computed tomography with 3D reconstruction examination showed displaced right isolated zygomatic complex and arch fracture without any other associated facial bone fracture and with no significant head injury. Routine laboratory investigations were within normal range.

Treatment

At first primary management was done at the Department of Trauma and Emergency, closed all lacerated wound by non-absorbable suture with prescribed antibiotics and analgesics for infection and pain control. Next day morning done all investigations and plan for management. As isolated right zygomatic complex fracture, he underwent open reduction and internal fixation of zygomatic complexes including the closed reduction of the arch by Gillies approaches and fixation via an intraoral approach at the Lefort level I. The postoperative recovery was uneventful with good mouth opening and with no cosmetic deficit. Necessary Prescribtions and Post-operative instructions were given.

Follow up

Postoperative follow up after 21 days showed considerable reduction in the size of swelling on right zygomatic region with good mouth opening and with no cosmetic deficit and occlusion was well maintained. Removal of Erich Arch bar and with radiological finding showed no bony abnormalities are present in right zygoma region.

Discussion

The zygoma is the second most common site of facial bone fracture. The vast majority of zygomatic fractures occur in men in their third decade of life. In 1994, Covington *et al* reviewed 259 patients with zygomatic fractures and found that zygomaticomaxillary complex fractures occurred in 78.8% of patients, isolated orbital rim fractures occurred in 10.8% of patients, and isolated arch fractures occurred in 10.4% of patients. Of the isolated arch fractures, 59.3% were displaced or comminuted.[3]

The exact mechanism of how isolated zygomaticomaxillary complex fractures alone occur after RTA is difficult to explain but can be attributed to impacts with one trajectory of force occurring as the patient was thrown out of the vehicle. In our case, the right side was displaced probably due to the fact that the impact on the right was more forceful. As unilateral fractures where an unaffected side used as a clinical guide for symmetry. In this case, the occlusion was not disturbed, and there was no maxillary mobility of a Lefort maxillary fracture where of course zygoma fractures are seen. The factors to consider in reduction were to anatomically reduce the malar prominence and the zygomatic arch for symmetry, function, and the restoration of orbital volume.

The sites of impact force in the facial bones and the management pertaining to this fracture (complex zygomatic fractures not involving the occlusion) are illustrated.

Conclusion

Anamnesis, clinical and imaging examinations are primordial for the choice of the best surgical technique and surgical material, minimizing possible complications, favoring aesthetic and functional rehabilitation. In the clinical case in question, the material used was paramount for final aesthetic and functional results. In case of zygomatic complex fracture, surgical planning is essential for the final result.

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