

ORIGINAL RESEARCH ARTICLE

# Incidence and Management of Zygomaticomaxillary Complex Fractures Treated at Mahatma Gandhi Mission Hospital, Aurangabad, Maharashtra.

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## Abstract: -

**Background :** The aim of this study was to evaluate the clinical patterns of orbital wall fracture in 60 patients who were treated at MGM medical college, Aurangabad ,Maharashtra, India between September 2016-December 2018.

**Material and Methods:** A descriptive prospective hospital-based study was carried out to determine the demographics, etiology, clinico-radiological features and management modalities among patients presenting with zygomaticomaxillary complex (ZMC) fractures at the MGM medical college, Aurangabad, Maharashtra, India.

**Results:** Sixty patients (44 male, 16female) with confirmed zygoma fractures on CT scan were recruited into the study. Zygoma fractures occurred most frequently in the 21-30year old age group (43.33%). The principal etiological factor was road traffic accidents 56.66%, falls 21.66%,work related 10% & assault at 11.6%. The most common sign and symptoms associated with orbital floor fracture were subconjunctival hemorrhage, trismus, diplopia,and infraorbital paresthesia. The most commonly affected anatomical site was the lateral wall (70%) followed by Zygomatic arch (66.6%), Zygomaticomaxillary buttress (63.33%), infra-orbital rim (60%), zygomatico-frontal suture (60%). In our study right side (34 patients) fractures are more common than left side fractures (16 patients). Most of the patients were managed operatively (38 patients).

**Conclusion:** The epidemiological data regarding etiological factors of zygoma fracture basically comprises of road traffic accidents (RTA) which is a potentially preventable cause. Thus by proper preventive measures and road safety precautions the incidence and morbidity associated with zygoma fracture can be significantly reduced. Also currently there is a need to select a subgroup of zygomatic fractures that can be successfully managed with less invasive techniques, as compared to previous standard form of treatment.

**Key Words:** zygoma, zygomatic fractures, orbitozygomatic fractures, orbital fractures.

## Introduction:

The zygomatic fracture is one of the most common cranio-facial fractures seen and treated and various terms have been used to describe it, the most commonest being zygomaticomaxillary complex (ZMC). The zygomatic complex fractures represent the second most frequent fractures of the middle face after the nasal bones [1-3]. In combination with those of

the orbit and naso-orbito-ethmoidal (NOE) complexes, they account for 30 to 55% of facial injuries [4]. The zygomaticomaxillary complex (ZMC), comprises of the zygoma and the adjacent parts of the frontal, maxillary, sphenoid, and temporal bones, constitutes the lateral orbit wall and part of the orbital floor.

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The temporal process of the zygoma and the zygomatic process of the temporal bone form the zygomatic arch, to which are attached the masseter and temporalis fascia. Because of these anatomic features, ZMC fracture can lead to periorbital paresthesia, facial asymmetry, ocular complications, and trismus [5-7].

The purpose of this study was to evaluate the most common type of zygomaticomaxillary complex fracture, associated facial trauma, etiology, sequelae, and management in patients presenting with facial fractures at MGM medical college, Aurangabad, Maharashtra, India.

Apart from it is important to choose approach for anatomic reduction to achieve functional and aesthetic restoration. Currently there is a need to select a subgroup of zygomatic fractures that can be successfully managed with less invasive techniques, as compared to previous standard forms of treatment needing wide exposure and anatomic reduction of the major buttresses with rigid fixation .

**Material and Methodology**

**Study Area & Design:** A descriptive prospective hospital-based study was carried out in patients

presenting with ZMC fractures at MGM medical college, Aurangabad, Maharashtra, India between September 2016-December 2018.

**Study population:** All patients who presented with zygomaticomaxillary complex fractures to the Department of Plastic Surgery confirmed by CT scan were included.

**Data collection:** Data collection was done through interviewing of the patients with zygoma fractures where possible. Where the condition of the patient did not permit an interview, relatives or attendants of the patient were interviewed. Medical records and case sheets were referred to whenever necessary to collect additional information.

Data collection included the evaluation of involved side, age and sex distribution, trauma etiologies, symptoms, examination findings, fracture localizations, treatment time after the trauma, treatment procedure, and complications after treatment. Follow-up was established from date of initial assessment to the last clinical evaluation. The range of follow-up was from 3 to 36 months, with a mean of 6 months.

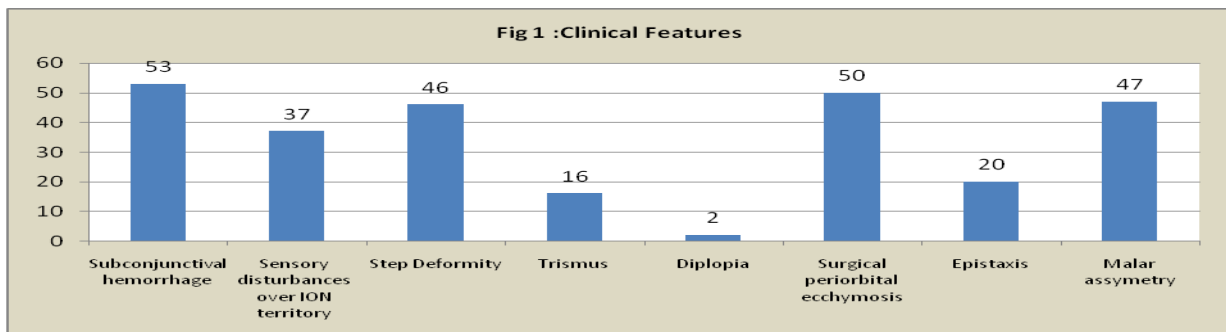
**Observation & Results:**

In our study period from September 2016 to December 2018 we had a total of 60 patients having zygoma fractures.

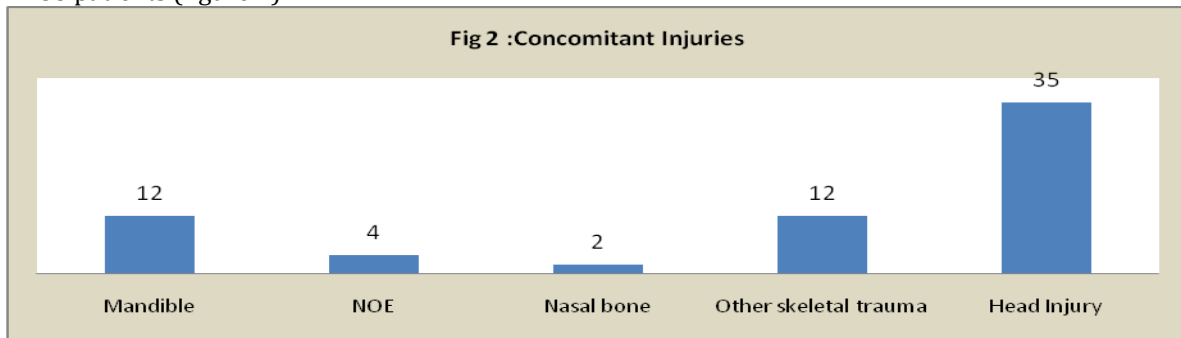
**Table 1 : Demographic Profile and Etiology of Patient**

Particular		No. of patients [N=60]	Percentage
Age-Group	11-20 yrs	03	5.00%
	21-30 yrs	26	43.33%
	31-40 yrs	16	26.67%
	41-50 yrs	13	21.67%
	51-60 yrs	02	3.33%
Gender	Male	44	73.33%
	Female	16	26.67%
Etiology	RTA	34	56.67%
	Falls	13	21.67%
	Work Related	06	10.00%
	Assault	07	11.67%

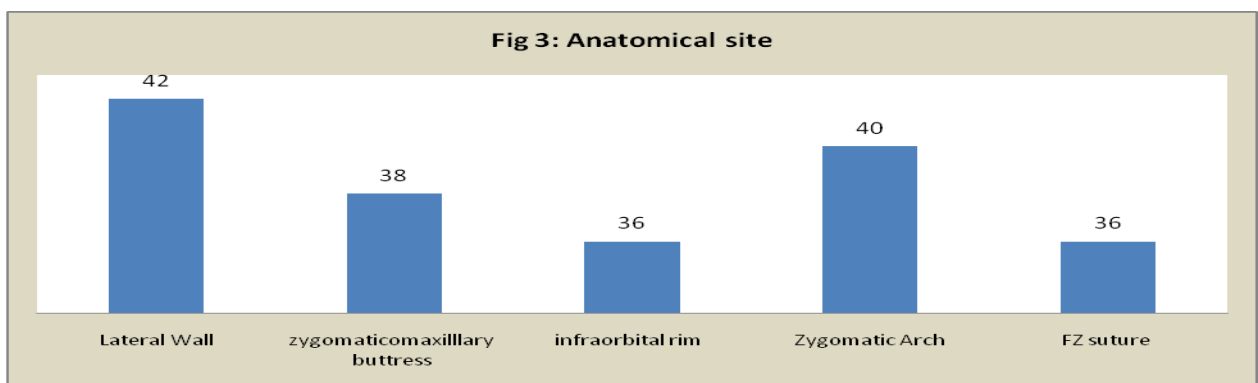
In our study the age of patients ranged from 11 years to 60 years. There was a marked predominance in the age group of 21- 30 years which was 43.33%. . Out of the 60 patients, 44 were male which accounted for 73.33 % and 16 were female which accounted for 26.6%. Right side (34 patients) fractures were more common than left side fractures (16 patients) .Out of the 60 patients, 34patients had RTA as their etiology, accounting for 56.6%. 13patients had sustained orbital fractures due to fall while 6 patient due to work related and 7 patients due to assault. RTA (road traffic accidents) was the cause of majority of the orbital floor fractures in our study.



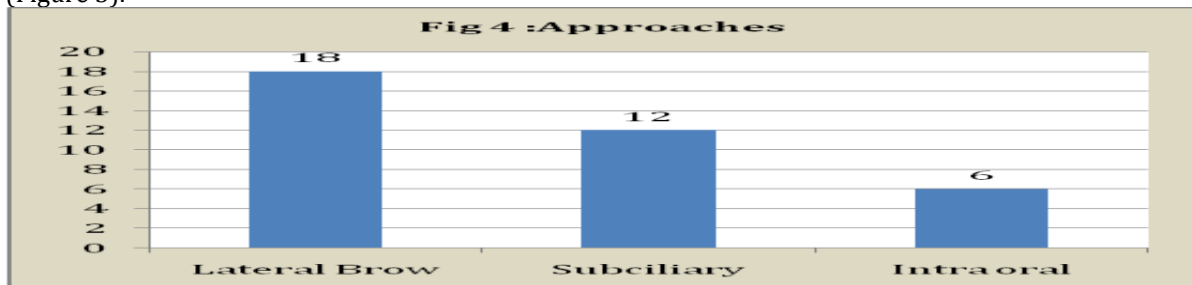
The most common sign and symptoms associated with zygoma floor fracture were trismus, malar asymmetry, periobital ecchymosis, diplopia, step deformity at infraorbital rim, epistaxis, diplopia and infraorbital paresthesia. The most common clinical feature in our study was sub-conjunctival hemorrhage which was present in 53 patients (figure 1).



In our study there were 35 patients had associated head injury and 12 patients had associated skeletal trauma ( Figure 2 )



The most commonly affected anatomical site was the lateral wall (70%) followed by the arch (66%), zygomaticomaxillary buttress (63%) fronto- zygomatic (FZ) suture (60.4%) and infraorbital rim (60%). (Figure 3).



Out of sixty patients 38 patients required operative treatment, and 22 patients were treated nonoperatively. The primary indications for surgery in all cases were trismus and/or diplopia. Closed reduction of the arch with no fixation was done using the Gillies' approach in 20 patients. 18 patients underwent open reduction and internal fixation of between 2 to 3 buttresses with miniplates and screws. 10 patients were treated with both Gillies elevation and ORIF. The zygoma fractures were treated exposing the frontozygomatic suture in 18 cases, inferior orbital rim fixation was performed through subciliary incision in 12 cases and intraoral approach was used in 6 cases. ( Figure 4 )

All the surgeries were performed by a single surgeon. The group of nonoperative patients with zygomatic fractures had no complication with good

mouth opening and occlusion at average follow up of 6 months. There were no complications in the operative group of patients. Complaints of transient paraesthesia and diplopia had completely resolved during follow-up visits.

**Discussion:**

This was a prospective, clinical study carried out on 60 patients with Zygomatic fractures. The predominance of men in this patient population is a relatively consistent finding in most studies [8-10]. This data may be explained as men tend to be involved in physical contact sports and are more frequent drivers.

The peak incidence of mid-face fracture was found in the age range of 21-30 years, which is in accordance with other studies [11,12]. From this analysis it was

found that sports accidents and falls were dominant in the first decade of life, traffic accidents, assaults and sport injuries were most prevalent in the second and third decade of life and accidental falls were frequent cause in the later decade of life.

In our study we found the etiology was RTA (56.66%), falls (26.6%), and assault (11.60%). This is well matched with other studies [13,14] A significant proportion of these accidents are associated with drug and alcohol abuse, speeding and disregard for the use of seat belts and mandatory helmet .Shapiro et al15 show the influence of use of protective devices like seat belts and helmets on morbidity and mortality, their use reducing both frequency and severity of facial injuries and protect motorcyclists and reduce the prevalence of zygomaticomaxillary fractures.

Tear of periosteum of orbital rim resulting in subconjunctival hemorrhage (88.33%) was the commonest symptom and is in accordance with other studies [16,17].

Degree of injury and need for exposure for open reduction and internal fixation dictates various approaches like coronal, hemicoronal, temporal, eyebrow, lower eyelid, upper eyelid, transconjunctival and infraciliary lower eyelid; and maxillary vestibular approaches, have been well described in the literature [18-20].

With aesthetic and functional restoration of both face and orbit as the main aim of reducing zygomatic fractures, lateral eyebrow incision, subciliary incision and intraoral vestibular incision were most commonly utilized for surgical exposure in our study. As for the zygomatic arch, Gillies temporal approach was preferred. These approaches provided best result with minimal complications such as pain and palpability of implants.

### Conclusion:

Zygoma fractures remain one of the most common maxillofacial fractures and result frequently from road traffic accidents, physical violence and falls. There are a large number of zygomatic fractures with a high incidence of nondisplaced fractures (36%) that can be managed nonoperatively. The highest prevalence is in young male patients (21 to 30 age range) and are not uncommonly associated with other fractures and potentially severe injuries. Use of protective devices, strict laws and severe punishments for violators must be implemented to reduce the frequency of zygomaticomaxillary complex fractures. In the operative patient, the goal should be accurate anatomic reduction of the zygoma which is the key to restore contour of the malar region .

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