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Research Article

Incidence And Management Of Zygomaticomaxillary Complex Fractures:A Prospective Study

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ABSTRACT

Background: The aim of this study was to evaluate the clinical patterns of Zygomatic Complex(ZMC) fracture in 40 patients who were treated at Karwar Institute of medical sciences,Karwar. Material and Methods: A descriptive prospective study was carried out to determine the demographics, etiology, clinico-radiological features and treatment modalities among patients presenting with zygomaticomaxillary complex (ZMC) fractures at Karwar Institute of medical sciences,Karwar. Results: Fourty patients (32 male, 12 female) with confirmed zygoma fractures on CT scan were included in the study. Zygoma fractures occurred most frequently in the 21-30year old age group (37.5%).Road traffic accidents 72.5 % being principal etiological factor followed by falls 5 %,work related 2.5% & assualt 10%. The most common sign and symptoms associated with zygomatic complex fracture were subconjuntival hemorrhage, trismus, diplopia,and infraorbital paresthesia. The most commonly affected anatomical site was the fronto-zygomatic suture (90%) followed by Zygomatic buttress (80%), infra-orbital rim (72.5%) and Zygomatic arch (45%). In our study left side (28 patients) fractures are more common than right side fractures (12 patients). Most of the patients were managed operatively (38 patients)using letral brow,intra oral ,subciliary or existing laceration. Conclusion: The data regarding etiological factors of zygoma fracture basically comprises of road traffic accidents (RTA). 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 zygomatic fractures that can be successfully managed with less invasive techniques fulfilling form function and esthetics.

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

Introduction: The zygomatic fracture is one of the most common cranio-facial fractures seen 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 [1-2]. In combination with those of the orbit and naso-orbito-ethmoidal (NOE) complexes, they account for 30 to 55% of facial injuries [3]. Zygoma is a strong buttress of lateral portion of middle third of facial skeleton, forms the malar prominence and is an integral part of the lateral and inferior orbital rim and the orbital floor. Because of its prominent position, it is more prone to fractures either alone or in combination with other structures of midface such as maxilla, nasoethmoidal and orbital area. [4-5]. 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 Karwar Institute of Medical Sciences, Karwar. 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.

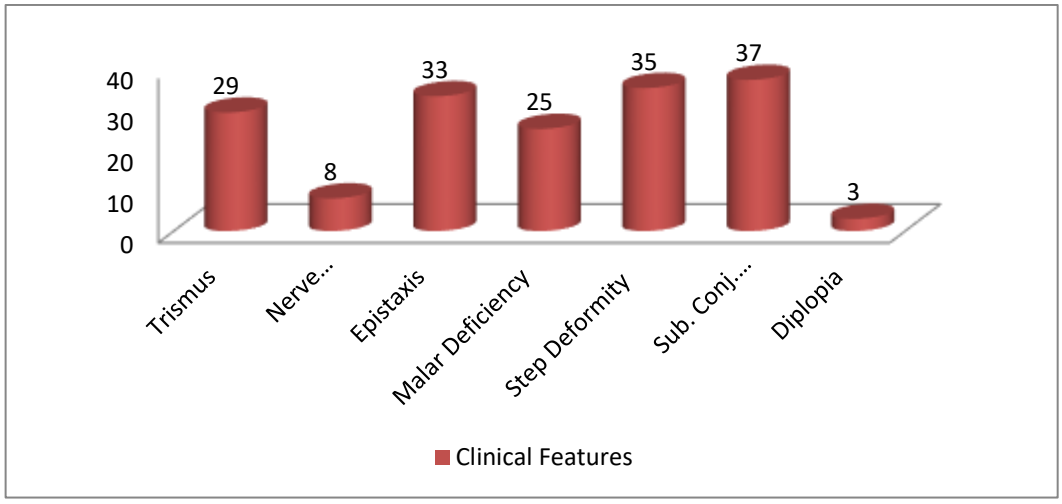
Material and Methodology Study Area & Design: A descriptive prospective hospital-based study was carried out in patients presenting with ZMC fractures at Karwar Institute of Medical Sciences, Karwar India between September 2021- March 2023. Study population: All patients who presented with zygomaticomaxillary complex fractures to the Department of Dentistry,KRIMS Karwar 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. 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 2021 to March 2023 we had a total of 40 patients having ZMC fractures.

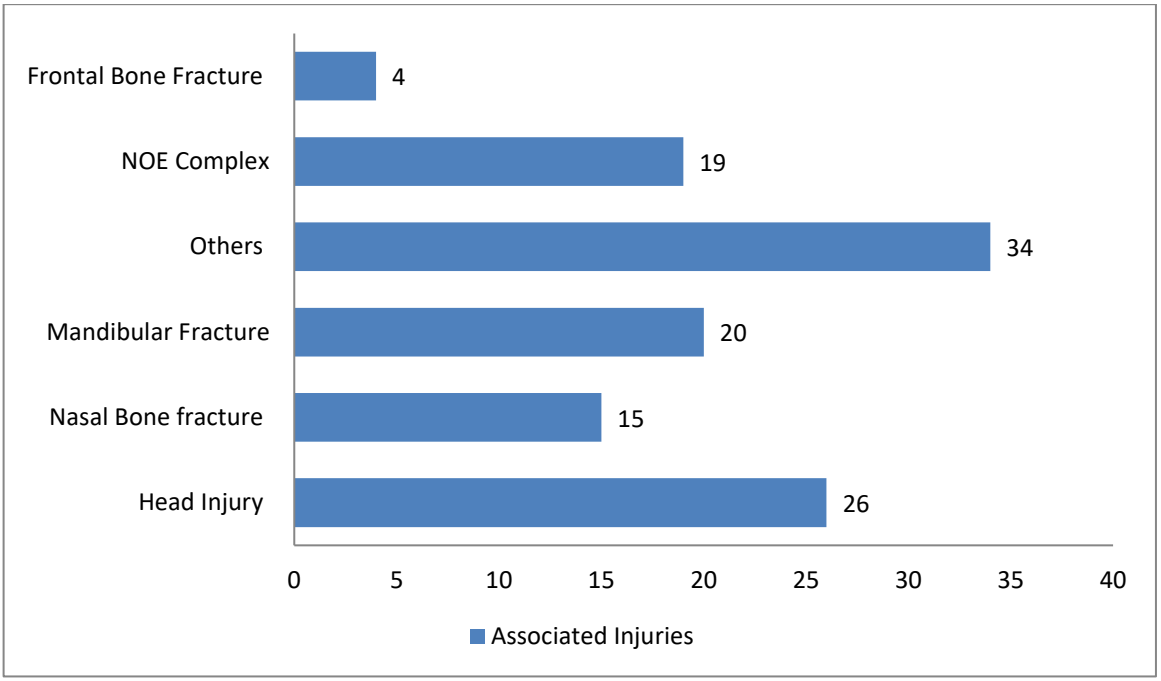
Particulars		*No. of patients n-40*	*Percentage*
Age	*11-20 years*	*04*	*10 %*
	21-30 years	*15*	*37.5 %*
	31-40 years	*10*	*25 %*
	41-50 years	*08*	*20 %*
	51-60 years	*03*	*7.5 %*
Gender	*Male*	*28*	*70 %*
	Female	*12*	*30 %*
Etilogy	*RTA*	*29*	*72.5 %*
	Assult	*04*	*10 %*
	Fall	*06*	*15 %*
	Occu.Injury	*01*	*2.5 %*

Table 1 : Demographic Data and Etiology

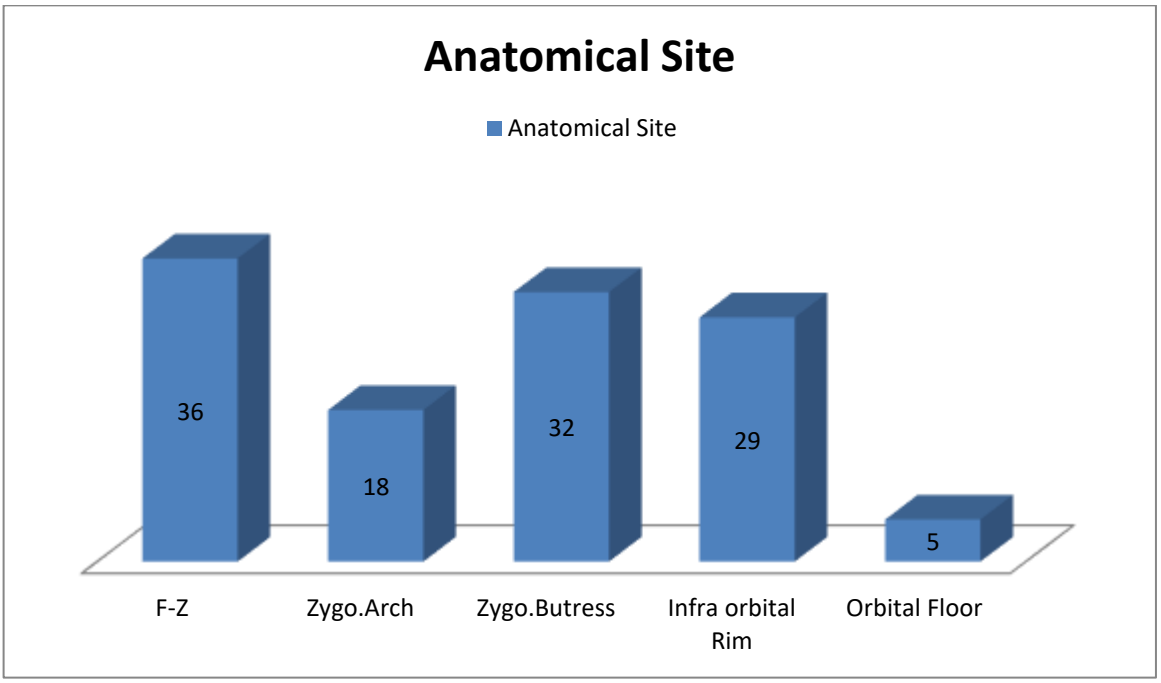
In our study the age of patients ranged from 11 to 60 years. There was a marked predominance in the age group of 21- 30 years which was 37.5%. . Out of the 40 patients, 28 were male which accounted for 70 % and 12 were female which accounted for 30%. Left side (28 patients) fractures were more common than right side fractures (12 patients) .Out of the 40 patients, 29 patients had RTA as their etiology, (72.5)%. 06 patients had sustained orbital fractures due to fall while 01 patient due to work related and 04 patients due to assault. RTA (road traffic accidents) was the cause of majority of the ZMC fractures in our study.



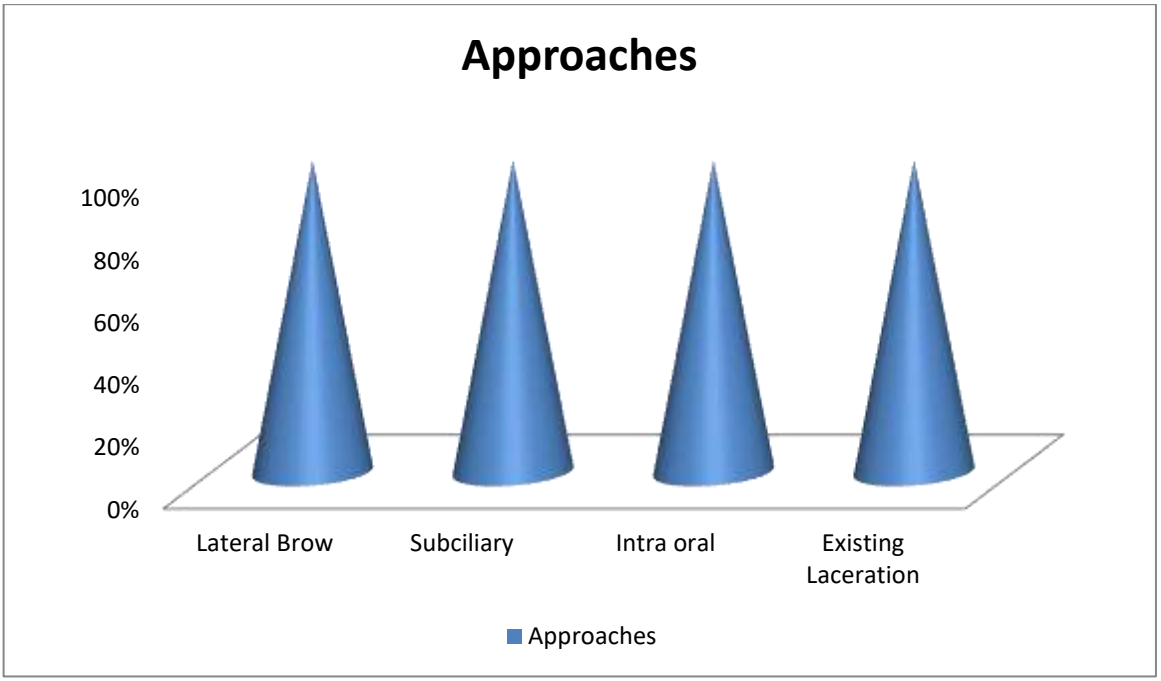
The most common sign and symptoms associated with zygoma fracture were trismus, malar asymmetry, periobital edema and ecchymosis, diplopia, step deformity at infraorbital rim, epistaxis, diplopia and infraorbital paresthesia. The most common clinical feature in our study was sub-conjuctival hemorrhage which was present in 37 patients (Graph 1)



In our study there were 26 patients had associated head injury and 34 patients had associated skeletal trauma (Graph 2)



The most commonly affected anatomical site was the fronto-zygomatic suture (90%) followed by Zygomatic buttress (80%), infra-orbital rim (72.5%) and Zygomatic arch (45%) (Graph 3).



Out of fourty patients 38 patients required operative treatment, and 2 patients were treated conservatively. The primary indications for surgery in all cases were trismus and/or diplopia. Closed reduction of isolated arch with no fixation was done using the Gillies/intraoral ' approach in 06 patients. 32 patients underwent open reduction and internal fixation of between 2 to 3 buttresses with miniplates and screws . 10 patients were treated with both Gilles 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. (Graph 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 40 patients with Zygomatic fractures. The predominance of men in this patient population is a relatively consistent finding in most studies [6-7]. This data may be explained as men tend to be involved in physical contact sports and 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 [8]. 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 (72.5), falls (15%), and assault (10%). This is well matched with other studies [9] 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 subconjuctival hemorrhage (37) was the commonest symptom and is in accordance with other studies [11]. 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 [11-12]. 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 that can be managed conservatively . 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

Conflict of interest : NIL

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