Management of Zygomatic Complex Fracture in Armed Forces

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Abstract

Introduction: The Armed Forces personnel are exposed to various kinds of injuries due to the nature of their duties. Increase in motorized population without taking protective measures and rise in violence has contributed towards maxillofacial injuries. The aim of this study was to determine the incidence, aetiology and management of injuries resulting in fracture of the Zygomatic complex in Armed Forces personnel and their families.

Methods: This study was conducted at Command Military Dental Centre (EC). Out of 90 maxillofacial injuries, 40 individuals (44.4%) were treated for Zygomatic complex fractures, majority were in their third decade of life and RTA was the leading cause. **Result:** Thirty seven individuals (92.5%) recovered uneventfully, while three (7.5%) patients had post operative complications such as enophthalmos, paraesthesia, diplopia, facial asymmetry, palpability of implants and facial nerve paresis. These complications were subsequently treated successfully.

Conclusion: The midface is composed of fragile bones which get fractured easily. It is imperative to educate people regarding the use of protective headgears/seat belts while travelling in motorized transport.

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Key Words : Zygomatic complex; Road traffic accident (RTA)

Introduction

Maxillofacial injuries are on the rise and the aetiology of maxillofacial injuries varies from one country to another because of social, cultural and environmental factors. Road traffic accident (RTA) is still the most common cause of maxillofacial injuries.

Zygomatic region is the most prominent portion of face after nasal bone and mandible and therefore Zygomatic complex fractures are second most common facial fractures after nasal bone in the lateral midface [1]. The aim of this study was to assess the incidence, aetiology and demand for oral and maxillofacial services associated with facial trauma in Armed Forces personnel and their dependants. This study was conducted at Command Military Dental Centre (EC), Kolkata.

Material and Methods

We studied 40 (44.44%) patients of Zygomatic complex fractures out of a total 90 cases with maxillofacial injuries. Of these 29 (72%) patients were received from peripheral hospitals. 32 (80%) patients sustained Zygomatic complex fractures due to RTA. The other aetiologies were sports injuries seen in four (10%), assault in two (5%) and fall in two (5%) cases. Majority presented with flattening of malar eminence, circumorbital ecchymosis, subconjunctival haemorrhage, partial trismus and paraesthesia of infraorbital

nerve. Of these five (2%) presented with diplopia, hypoglobus and enophthalmos in addition to the routine signs and symptoms. On the basis of these clinical findings the diagnosis was confirmed on routine radiographs (Paranasal sinuses view, Submentovertex view) and computed tomography (CT) scans (Figs. 1, 2). All patients were treated by open reduction and rigid internal fixation (ORIF) using titanium mini plates and screws. 28 (70%) cases were managed by two point fixation and eight (20%) by three point fixation (Fig. 3). Isolated arch fracture stabilization was done in four (10%) cases. Antibiotic regimen of intravenous use of Inj Ampicillin 500mg every 6 hours, Inj Amikacin 500mg every 12 hours, Inj Metronidazole 500mg every 8 hours for total 3-5 days was followed as a protocol in our centre. Patients were reviewed with check radiographs (Fig.3A) to assess fracture stabilization, approximation and immobilization. Function, esthetics and neurological assessments were done in immediate post operative phase and during periodic review. Ocular functions such as eye movements, presence/absence of diplopia were assessed postoperatively [2,3]. All patients were reviewed for the period ranging from one month to one year with an average of six months.

Results

The age group of the patients varied from 16 to 80 years with the mean of 32 years (Table 1). The highest incidence of fracture was seen between the age group of 20 to 30 years. Thirty six (90%) patients were male and four (10%) patients

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Fig. 1 : A) Radiograph (PNS) with enblock displacement of zygomatic complex (Rt). B) Radiograph (SMV) shows comminution of zygomatic arch (Rt)

Fig. 2 : 3D CT scan shows enblock displacement of zygomatic complex (Rt)

Fig. 3 : Two/three points fixation as seen in A) 3D CT scan. B) Intra-operative photograph

were female. Sixteen (40%) patients had left side and 24 (60%) had right sided fractures. Most were operated two weeks after the date of injury due to loss of time during travel from peripheral hospitals.

We found uneventful recovery in 37 (92.2%) cases, while three (7.5%) cases developed post operative complications in the form of pain, paraesthesia, trismus, ectropion, enophthalmos, facial asymmetry and paresis of facial nerve (Table 2) which have been managed by corrective procedures such as implants removal, release of entrapped infraorbital nerve, scar revision and physiotherapy.

Discussion

Zygomatic bone is a quadrangular bone and situated at the lateral midface. Fracture of zygomatic complex is the second most common fracture after nasal bone due to its prominence in lateral midface [1,5,6]. A patient with maxillofacial injuries presents with a clinical picture of gross facial swelling, pain, circumorbital ecchymosis, subconjunctival haemorrhage, step deformity with facial asymmetry and trismus. Radiological investigation give an accurate diagnosis regarding the extent of injury.

The epidemiological survey on the causes and incidence of maxillofacial injuries vary with geographic region, socioeconomic status, culture, region and era [7]. zygomatic complex fracture accounts for 45% of all midface fractures as documented by Kovacs et al [8], which is in agreement with our findings. RTA is the most common cause followed by sport injury, assault and fall in this study which corroborates well with epidemiology reported in the literature [9,10].

Table 1

Treatment details

Age Group	No of patient	Peripheral hospital	Local	Results
Two point fixation (n=28)				
16-20	03	02	01	Good
20-30	15	11	04	Excellent
30-40	05	03	02	Good
40-60	03	01	02	Excellent
60-80	02	01	01	Excellent
Three point fixation (n=8)				
16-20	01	01	-	Excellent
20-30	02	02	-	Good
30-40	04	03	01	Satisfactory
40-60	01	01	-	Good
Isolated arch fracture fixation (n=4)				
20 - 30	02	02	-	Good
30 - 40	02	01	01	Satisfactory

Table 2

Complications

No. of patient	Point of fixation	Complication	Management	Recovery
1/28	Two	Pain, palpability of plate and facial asymmetry	Implants removed	Uneventful recovery
1/08	Three	Paraesthesia, ectropion and scar	Release of entrapped nerve, implant removal and scar revision	Uneventful recovery
1/04	Arch	Paresis of temporal branch of facial nerve, trismus	Physiotherapy and reassurance	Partial paresis persisted

In our study zygomatic complex fractures formed 44.44% of all facial fractures. The male female ratio was 10.2:1. The age group was most frequently between 20 to 30 years (Table 1). Slightly increased involvement on right side of face was evident in our study. Two point fixation methods was preferred to achieve stability against rotation with best esthetic outcome as the scars were well hidden intraorally and in the eyebrows [11].

This approach provided best result with minimal complications such as pain, palpability of implants and mild facial asymmetry in one case. However, opinions vary and different combination have been documented in literature [12]. Eight cases were managed by more than two point fixation, but no extra benefits were achieved from these approaches on reduction and stabilization point of view vis-à-vis two point fixation, and one patient in this group developed complications.

Facial bones, especially of the middle third of the face, are composed of a network of fragile bones held together across sutures which give way in case of force to a lesser extent than other parts of the body. The key to management of facial trauma is to operate the cases as soon as clinical conditions permits with a special emphasis on function and esthetics.

With the introduction of compulsory use of seatbelts in developed nations there is a significant reduction of facial injuries [13]. In India as per Motor Vehicle Act (MVA) use of seatbelts and helmets is compulsory, but the compliance is poor. It is imperative to educate people regarding the use of headgear (crash helmet) and seatbelts while traveling in motorized transport which will go a long way in preventing injuries to facial region.

Conflicts of Interest

None identified

Intellectual Contribution of Authors

Study Concept : Col PK Chattopadhyay, Maj Gen M Chander

Drafting & Manuscript Revision : Col PK Chattopadhyay

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