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RESEARCH ARTICLE

Associated Injuries in Patients with Maxillofacial Fractures in Erbil Governorate, Iraq

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Abstract

Background and objectives: Maxillofacial fractures can occur as an isolated fracture or may occur with injuries of other parts of the body. The objective was to find out the frequently occurring concomitant injuries in patients with maxillofacial fractures, in Erbil Governorate, Iraq

Methods: Prospective, clinical study performed on 240 patients with maxillofacial fractures, over a six-month period, for concomitant injuries.

Results: Males were predominantly affected (62.5%); patients in the 21–30-years age group were most frequently affected (39.6%). Vehicle accident was the most frequent reason of maxillofacial fractures (37.5%) and mandible was the most frequent facial bone involved (47.9%). The study shows that 112 patients (46.6%) had concomitant injuries and head (31.9%) and chest (19.8%) were most commonly involved.

Conclusion: Concomitant injuries elsewhere in the body may coexist with maxillofacial fractures in a high proportion of cases. This relationship makes it necessary for the maxillofacial surgeon to be part of a trauma team.

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Introduction

Maxillofacial region involves soft and hard tissues forming the face extending from frontal bone superiorly to the mandible inferiorly. The face being the most exposed part of the body is particularly prone to trauma. Trauma to the facial region causes injuries to skeleton components, dentitions as well as soft tissues of the face. Maxillofacial trauma is presented as isolated injuries or a part of polytrauma in emergency department of the hospital.¹

Facial trauma may be considered one of the most significant aggressions found in trauma centers due to the emotional consequences, the possibility of deformation, and the economical impact it causes in the health system.² Because of little protection and considerable exposure of the facial region, a great number of severe facial lesions often occur. Head and face lesions may represent 50% of all traumatic deaths.³

Patients classified as having maxillofacial trauma can present with a variety of injuries ranging from minor to life threatening. Injuries classified as maxillofacial include 1) fractures to any of the facial bones; 2) soft tissue injuries to the face and intraoral structures, including lacerations, abrasions, and contusions; 3) dental injuries, including impaction, subluxation, avulsion, and fractures of the teeth or alveolar bone; and 4) temporomandibular joint dislocation.

The associated injuries certainly may occur in patients with maxillofacial trauma; however, the ED practitioner must be skilled in their management. These associated injuries in the head and neck area, as well as injuries to the

other systems, such as the pulmonary system, can add greatly to the complexity and difficulty of patient management.⁴

There are considerable statistical differences in the occurrence of associated injuries among gender, age group, trauma mechanism, and type of fracture. The mechanism of these traumas may be through automobile accidents, falls, interpersonal violence, sports, and victims hit with objects.⁵

Hands and arms are usually used by patients' victims of trauma as protection against a facial lesion, while legs and thorax are usually directly impacted in car accidents or falls.⁶

The aim of this study was to find out the anatomical location and frequency of associated injuries in patients with maxillofacial fractures in Erbil city hospitals.

Methods

The study was performed on 240 patients with maxillofacial fractures attended Central Emergency and Rozhhalat Emergency Hospitals, from beginning of March 2010 until the end of August 2010.

All the patients presenting in emergency department with maxillofacial fractures were examined by team of Oral & Maxillofacial Surgery Department. Patients with isolated nasal fractures were not included (because these patients were usually referred to otolaryngology department).

The parameters of this study include; age, sex, etiology of fractures, maxillofacial bone involvement, and concomitant injuries of the body.

A history was taken from the patient or the accompanying person and questionnaire sheet filled for each patient. Required conventional radiographs were taken for every patient and imaging modality like computed tomography (CT scan) and/or magnetic resonance imaging (MRI) were done when required.

Maxillofacial fractures were classified according to bone involved as mandible, maxilla, zygomatic complex and orbital walls fractures.

Concomitant injuries were recorded according to anatomic site as ocular, head (cranium), cervical spine, chest, upper limbs, lower limbs and abdomen.

Results

A total of 240 patients with maxillofacial fractures registered in emergency department during the study period. The youngest patient was 11 years old while the oldest patient was 70 years old and patients in the 21–30-years age group were most frequently affected (39.6%). (Table1). Out of 240 patients, 150 patients were male constituting 62.5%, while 90 patients were female constituting 37.5%.

Table (1) :Age distribution of patients.

Age(years)	Number	Percent
11-20	25	10.4%
21-30	95	39.6%
31-40	68	28.3%
41-50	26	10.9%
51-60	19	7.9%
61-70	7	2.9%
Total	240	100%

The commonly encountered etiology of fractures observed was road traffic accident (RTA) 90 (37.5%) afterward assault 45(18.75%), sports injuries 33 (13.75%), falls 30 (12.5%), missile injuries 24(10%) and occupational injuries 18(7.5%) respectively (table 2).

Table (2): Etiology of maxillofacial injuries.

Etiology	Number	Percent
RTA	90	37.5%
Assault	45	18.75%
Sports injuries	33	13.75%
Falls	30	12.5%
Missile injuries	24	10%
Occupational injuries	18	7.5%
Total	240	100%

The 240 patients had a total of 288 facial bone fractures; the majority (80%) of patients had single bone fracture and 48(20%) had fractures of two bones in maxillofacial region.

Mandible was the most frequent facial bone fractured in this study 138 (47.9%)

followed by zygomatic complex fractures 72 (25%), maxillary fractures 48(16.7%), and isolated orbital wall fractures 30 (10.4%) respectively (table 3).

Table (3): Types of maxillofacial fractures.

Fracture	Number	Percent
Mandible	138	47.9%
Zygomatic complex	72	25%
Maxilla	48	16.7%
Orbital wall	30	10.4%
Total	288	100%

Of the 240 facial trauma patients, 112 (46.6%) had concomitant injuries; these patients had 141 injuries in other regions of the body.

Head was the primary victim of facial trauma patient (31.9%); chest, upper limbs, lower limbs and eyeball were involved in 19.8%, 16.3%, 15.6% and 7.8% respectively. Cervical spine injuries which cause considerable morbidity and mortality in maxillofacial trauma patients were seen in only 4.3% of the patients and were the least commonly occurred injuries as abdominal injuries (Table 4).

Table (4): Distribution of associated injuries

Associated Injuries	Number	Percent
Head injuries	45	31.9%
Chest injuries	28	19.8%
Upper limbs injuries	23	16.3%
Lower limbs injuries	22	15.6%
Ocular injuries	11	7.8%
Cervical spine injuries	6	4.3%
Abdominal injuries	6	4.3%
Total	141	100%

Discussion

Facial injuries occur in significant proportion in trauma patients requiring prompt diagnosis and management. Maxillofacial injuries are common both in war and peace. The number of maxillofacial injuries is continuously increasing due to rise in traffic, and failure to take preventive measures in the traffic leads to road traffic accidents, which is the main etiological factor in maxillofacial fractures.⁷

A wide age range was included in this study but the mean age was found to be in 3rd decade. This correlates with other studies done in Pakistan⁸ and Poland.⁹

This result may be due to the fact that young people are relatively more energetic and involved in activities; also this age group is frequently involved in fighting and careless in following traffic law.

In this study males were found to be the major sufferers of maxillofacial fractures.

This correlates well with studies done in Brazil,¹⁰ Iran and¹¹ Pakistan¹².

Explanation for that is especially in our male dominated culture, males are more frequently involved in outdoor actions as compared with females.

In our study the most common reason of facial fractures was motor vehicle accidents followed by assaults. This finding has been confirmed by many other studies done in Brazil,⁶ Malaysia¹³ and Sharjah (United Arab of Emirate)¹⁴, our results are however in disagreement with study done in USA, where most common cause of facial fractures was assaults followed by motor vehicle accidents.¹⁵ The reasons for this high frequency of motor vehicle accidents in our study, may be due to the inadequate road safety wakefulness, violation of speed limits, old vehicles without security features such as anti-burst locks and energy absorbing equipment, failure to put on seat belts or helmets, entrance in to opposite traffic way, breach of the right of the way, breach of the highway rules or consumption of alcohol.

In our study mandible was the most frequent facial bone fractured, mandible being the most prominent mobile bone of the facial skeleton, is often fractured more than the other facial bones excluding nasal bones (isolated nasal fractures were not included in our study). Our result is in agreement with studies done in Iran,¹⁶ Australia,¹⁷ Emirate,¹⁸ and Pakistan.¹⁹

Different frequencies of concomitant injuries in patient with facial bone fractured have been mentioned in different studies –Lim et al 11.3% %, ²⁰ Thoren et al 25.2%,⁵ Obuekwe and Etetafia 44.2%²¹ and Carlin et al 89%.²² Of the 240 patients with maxillofacial fractures in our study, 112(46.6%) had injuries in other regions of the body. This difference in frequencies may be related to lack of standard definition of concomitant injuries, variations in etiologies of facial fractures and diverse in populations' characteristics and behaviors.

Head injury (31.9%) was the commonest type of associated injuries in our study, comparable to findings from several other studies.^{15, 22-24}

The high incidence of head injury in our study may be connected with neglected to wear seat belts or helmets (motorcyclists). In the United Kingdom where the use of seat belt and motorcycle helmet is mandatory, there has been a reduction in head and maxillofacial injuries.²⁵

Commonly occurring categories of injury this study included, Chest injuries (19.8%), extremities injuries (upper 16.3%, lower 15.6%), ocular injuries (7.8%), with abdominal organ injuries (4.3%) and Cervical spine injuries (4.3%) were less frequently detected, this result correlates well with other studies.^{16,21,27}

Ocular injuries are a relatively common complication of orbital walls fractures, occurring in 11 (7.8%) patients in this study. These injuries occur more often in patients with orbital walls fractures. Ophthalmology consultation is recommended for all patients presenting with orbital walls fractures.

Cervical spine injury is rarely associated with maxillofacial traumas,²⁷ as it was observed in this study (4.3%), it should be suspected when injuries above the clavicle occur. Cervical spine immobilization should never be removed until cervical spine injury has been excluded using a lateral x-ray of the cervical spine. In males with significant blunt maxillofacial trauma caused by high-energy impact accidents such as car and motorcycle accidents, computed tomography is the radiological examination of first choice to exclude cervical spine injuries and intracranial hematoma.²⁸

Conclusion

Maxillofacial fractures may present with other injuries in a high percentage of cases, for this reason full general examination should be carried out in patient with maxillofacial fractures to look for the injuries elsewhere in the body so that the proper specialist could be consulted, without delays. This is essential for the most excellent aesthetic and functional results.

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