

ETIOLOGY, PATTERN AND MANAGEMENT OF MAXILLOFACIAL FRACTURES IN PATIENTS SEEN AT MAYO HOSPITAL, LAHORE - PAKISTAN

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ABSTRACT

The objective of the study was to determine the varying etiology, pattern and mode of treatment of maxillofacial injuries in a tertiary care centre, Mayo Hospital, Lahore, Pakistan. This was a retrospective study spread over two years and six months i.e. January 2010 to June 2012.

214 consecutive indoor/ outdoor and emergency patients with maxillofacial injuries formed the study group. Data concerning the patients' demographics, aetiology, occupation, socioeconomic status and pattern of maxillofacial injuries were obtained and analysed.

The most frequent bone fractured was the mandible, which accounted for 106 cases 49.5%, followed by 15.4% of pan facial (full house) fractures and 15.4% of Zygomatic complex fracture. The associated mid face fractures were found in 12.6 % and isolated nasal bone fractures were found in 1.5% cases. The most common cause of injury was RTA 58.4%, followed by falls 24%, FAIs 6.1%, interpersonal violences 2.8%, sports and other injuries were 8.4%. Employees 49.5% and students 31.3% in age groups 20-40 years were mostly affected by RTA, while falls 14.4% were more common in age group less than 20 years. Open reduction and internal fixation alone 43.9%, maxillomandibular fixation±suspension 38.8% and open reduction and internal fixation with maxillomandibular fixation 14.5% were the main mode of treatment in this centre. In this study, mandible was the most commonly fractured facial bone; RTA especially by motorbike and chigchi rikshaw was the most common etiological factor. Results could be influenced by the personal and working environment.

Key Words: *Maxillofacial injury. Maxillary bone fracture, Road traffic accident, Pan facial trauma.*

INTRODUCTION

Maxillofacial trauma is a major cause of mortality and morbidity worldwide. It is presented in accident and emergency department of the hospital as isolated injuries or part of poly-trauma.¹ It is a frequent occurrence in Pakistan and is associated with high incidence of facial fractures in different combinations. Maxillofacial trauma can be limited to superficial lacerations, abrasions or it may be associated with multiple injuries to the chest, head, cervical spine, abdomen or the extremities. It not only hampers the function but also causes serious psychological and cosmetic deficiencies.²

Some of the most severe maxillofacial injuries are caused by automobile accidents but many others may result from industrial accidents, sports, home accidents and missiles or gun shots.² The frequency of facial injuries is high because face is exposed and there is little protective covering.³

The treatment of such injuries is accomplished in three phases. The primary phase deals with survival of the patient by maintenance of hemodynamics and airway function. In the intermediate phase, supportive line such as antibiotics prophylaxis and treatment of infections, control of bleeding and tissue debridement are done. The third phase is the reconstructive phase. The aim of this phase is reconstruction of the soft and hard tissues (using grafts if required), reduction and fixation of bone segments, reconstruction of the nasolacrimal system, release of scar tissue, and correction of sensory and motor nerve dysfunction.⁴

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Epidemiological studies of maxillofacial trauma have classically shown that young adult males are the predominant victims.⁵ Maxillofacial injuries are not uncommon in Pakistan.⁶ A compromised cosmetic, functional and psychological outcome may result when these components of successful treatment are not practiced.⁷ The causes and incidence of maxillofacial injuries vary widely from one country to another because of social, cultural, and environmental factors.⁸⁻¹²

RTA have been reported as a leading cause of mandible fractures in many third world countries while interpersonal altercations are mainly responsible in the developed countries.¹³⁻¹⁸ The differences reflect a lack of traffic regulations including seat belt and helmet enforcements, absence of air bags in the vehicles and poor road infrastructure in the underdeveloped and alcohol abuse in the developed countries.¹⁶⁻¹⁸

The rapid mechanization of our society in recent years coupled with miserable condition of our roads has increased the incidence of maxillofacial trauma beyond any proportion. The high speed injuries have altered the nature and pattern of facial trauma.

The aim of this study was to determine the relative frequency of various etiological factors and pattern of maxillofacial fractures in the Department of Oral and Maxillofacial Surgery, Mayo Hospital Lahore.

METHODOLOGY

This study was conducted on 214 patients in the Oral and Maxillofacial Surgery Department, King Edward Medical University/Mayo Hospital Lahore, Pakistan from January 2010 to June 2012. Patients of either gender were included who presented with facial fractures. Patients having only soft tissue facial lacerations were excluded. The management of emergency cases was started from Accidents and Emergency Department according to Advance trauma life support protocols. The wounds were repaired or dressed after hemostasis and some mandibular fractures or other open fractures were temporarily stabilized using wires. Patients were also evaluated by neurosurgery/ orthopedics/ ophthalmologist or other specialists wherever indicated.

After initial management, patients were admitted in Oral & Maxillofacial Surgery ward. They were allowed to take liquid/ semi-solid food, along with dietary supplements. Suitable antibiotics, analgesics and oral rinses were also prescribed. Thorough clinical evaluation with the help of plain X-rays, (e.g. Water's view, PA face and town's or reverse town's views), OPG or CT scans with or without 3-D reconstructions were done.

For each patient an informed consent was taken. The patients were operated under general anesthesia or under local anesthesia using nerve blocks/ and I/V sedations. The fractures were approached through intraoral and extraoral standard incisions (e.g. gingivo-buccal, coronal, blephoroplasty, transconjunctival, pre-auricular, retro-mandibular, orbital rim incisions) or through existing lacerations. Nasogastric (NG) intubation was done for 48-72 hours postoperatively in most of panfacial fractured patients for feeding purposes. Most of the poly-trauma patients got their treatment done in joint ventures of multiple specialties. Patients were followed up for atleast 6-months.

RESULTS

Total 214 patients were treated during January 2010 to June 2012. Most of the patients were males n=190 (88.8%) with a male to female ratio of 7.9:1. Most of the patients n=73 (34.1%) belong to age group 20-29 years (Table 1). Employees n=106 (49.5%) and students n=67 (31.3%) are mostly affected by RTAs (78.4%), while falls (88.3%) are more common in age group less than 20 years. The most frequent bone fractured was the mandible, which accounted for n=106 (49.5%) cases. Followed by n=33 (15.4%) cases of pan facial trauma, n=33 (15.4%) cases of Zygomatic complex fracture. The combined mid face fractures were found in n=27 (12.6%) cases and isolated nasal bone fractures in n=3 cases (1.4%) cases. The most common cause was RTAs n=125 (58.4%) cases, followed by accidental falls n=52 cases (24.3%) cases, FAIs n=13 (6.1%) cases, interpersonal violence n=6 (2.8%) cases, sports and other injuries were n=18 (8.4%) cases. For treatment of fractures, ORIF n=94 (43.9%) cases, ORIF with MMF n=31 (14.5%) cases and MMF with or without suspension in n=83 (38.8%) cases were the main mode of treatment.

DISCUSSION

Maxillofacial injuries are common in Pakistan.³⁻⁶ The frequency of facial injuries is high because the face is exposed and has a little protective covering. A unique aspect of facial injuries is that the restoration of appearance may be the chief indication for treatment.¹⁹

Maxillofacial trauma is presented in Accident and Emergency Department of hospital as isolated injuries or a part of poly trauma. It can be limited to superficial laceration or abrasion or it may be associated with multiple injuries to chest, head, spine, abdomen or the extremities.³ It not only hampers the function but also causes serious psychological and cosmetic deficiencies.⁴ Some of the most severe facial injuries are caused by automobile accidents, sports, home accidents, and missiles or gunshots.⁴ The frequency of facial injuries is high because face is exposed and there is little pro-

TABLE 1: AGE DISTRIBUTION OF PATIENTS WITH MAXILLOFACIAL TRAUMA/ FRACTURES

Age groups	Frequency	Percent	Valid Percent	Cumulative Percent
0-9	29	13.6	13.6	13.6
10-19	36	16.8	16.8	30.4
20-29	73	34.1	34.1	64.5
30-39	40	18.7	18.7	83.2
40-49	16	7.5	7.5	90.7
50-59	11	5.1	5.1	95.8
60-69	6	2.8	2.8	98.6
70 above	3	1.4	1.4	100.0
Total	214	100.0	100.0	

TABLE 2: ASSOCIATION OF PROFESSION WITH MAXILLOFACIAL TRAUMA

Profession of patients	Frequency	Percent	Valid Percent	Cumulative Percent
Working person	106	49.5	49.5	49.5
Non working person	25	11.7	11.7	61.2
Housewife	8	3.7	3.7	65.0
Student	67	31.3	31.3	96.3
Working person+student	8	3.7	3.7	100.0
Total	214	100.0	100.0	

TABLE 3: TYPE OF FRACTURE

Type of fractures	Frequency	Percent	Valid Percent	Cumulative Percent
# Mandible	106	49.5	49.5	49.5
# Zaygoma bone	33	15.4	15.4	65.0
# Maxilla	7	3.3	3.3	68.2
Nasal bone	3	1.4	1.4	69.6
Frontal bone	1	.5	.5	70.1
# NOE	1	.5	.5	70.6
# Zaygoma arch	3	1.4	1.4	72.0
Combined mid #	27	12.6	12.6	84.6
Panfacial #	33	15.4	15.4	100.0
Total	214	100.0	100.0	

TABLE 4: CAUSE OF MAXILLOFACIAL FRACTURES

Causes of fractures	Frequency	Percent	Valid Percent	Cumulative Percent
FAI	13	6.1	6.1	6.1
Falls	52	24.3	24.3	30.4
RTA	125	58.4	58.4	88.8
Interpersonalvoilance	6	2.8	2.8	91.6
Other	18	8.4	8.4	100.0
Total	214	100.0	100.0	

TABLE5: TYPE OF TREATMENT GIVEN

Type of treatment	Frequency	Percent	Valid Percent	Cumulative Percent
ORIF	94	43.9	43.9	43.9
MMF	83	38.8	38.8	82.7
ORIF+MMF	31	14.5	14.5	97.2
Arch bar/Elastics	6	2.8	2.8	100.0
Total	214	100.0	100.0	
Total	214	100.0	100.0	

TABLE 6: ASSOCIATED INJUTIES

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid facial Laceration	48	22.4	22.4	22.4
nasal bone	8	3.7	3.7	26.2
chest/abdomial inmjuries	2	.9	.9	27.1
Cervical spine injuries	3	1.4	1.4	28.5
not associated	153	71.5	71.5	100.0
Total	214	100.0	100.0	

TECTIVE COVERING.³ A unique aspect of facial injuries is that the restoration of appearance may be the chief indication for treatment.³ Epidemiological studies of facial trauma have classically shown that young adult males are the predominant victims.⁵⁻⁸ The etiology, type and site of facial fractures vary depending on many factors.⁹ These injuries vary from soft tissue lacerations to complex fractures of maxillofacial skeleton. Mandible is more often fractured than the strongly supported middle third of the face because of its position, shape and type of injury.⁶⁻⁸ The incidence of facial fractures varies with age, region, a period of time, climatic conditions, socio-economic differences, traffic volume and preventive measure taken in different countries.¹⁰⁻¹³ Being a male dominant society, the male works outdoors and hence are more susceptible to accidents.¹⁴ The same observation was noted in other studies.¹⁵⁻¹⁸ This study shows that the most common cause of facial fracture was road traffic accidents (58.4%) especially by motor bike accidents and Chingchi Rikshaws, which is consistent with the other studies carried out in Pakistan.¹⁵⁻¹⁷⁻¹⁸ and also in other countries.⁵⁻⁸⁻¹⁹ The reason for the accidents in our setup was due to the socio-economic conditions and violations of traffic rules whereas in developed countries, accidents are mostly due to alcohol intoxication.⁵ Majority of the patients in this study had other associated injuries which were treated concomitantly. Patients having element of head injury were observed and treated by the active participation of the neurosurgery department. Facial lacerations were closed primarily. Intraoral approach was preferred which resulted in leaving no residual scar and improved aesthetics postoperatively. For most

of the fractures, open reduction and internal fixation were used which included titanium mini plates, reconstruction plates, resorbable miniplates, with or without Maxillomandibular fixation (MMF). Majority of the fractures involving maxilla and temporomandibular (TMJ) region especially in pediatric patients were also managed by MMF. Most of the mandibular fractures and fractures of zygomatic bone were managed by open reduction and internal fixation (ORIF±MMF). Mandible (59.4%) was the most frequently involved bone in the current study. Similar observations were also noted in other studies.⁵⁻⁷⁻¹⁵⁻¹⁶⁻¹⁸ Most (86%) of mandibular fractures were managed by open reduction whereas 14% by closed reduction (MMF). Various options used were microplates, miniplates, resorbable plates, reconstruction plates, transosseous wires. Fractures of maxilla were managed by closed reduction (57%) with circumzygomatic wires and open reduction (43%) using microplates and miniplates. The orbital fractures were fixed by using, miniplates, microplates, titanium mesh and interosseous wires. Care was taken to provide good soft tissue coverage to avoid any possibility of palpable implants postoperatively. Every effort was made to avoid any external incision. Majority (98.6%) of the mandibular fractures were approached through intraoral incision. Similarly majority of the maxillary (88.9%) and zygomatic fractures (62.5%) was approached through intraoral incisions. However, orbital fractures were approached through the external incisions. Overall, 33.3% of the fractures were fixed by using extraoral approach. Patients managed by MMF alone had a longer duration of immobilization (5-6 weeks) as compared to the patients having ORIF±MMF (1-2 weeks) because it

resulted in early mobilization of the jaws. Moreover, we also used dental elastic rubber bands along with arch bars after removing the wires of MMF to encourage the mouth opening. The complications encountered during this study were few, majority being attributed to the initial injury. Pain (16.7%) was the most common. Only 7.3% of the patients had malocclusion with 4.2% having slight overbite. One case of recon plate breakage occurred. Lower lip paraesthesia (4%) was in patients with mandibular fractures and was a result of direct injury which severed the mental nerves. Only two cases of the implant infection were noticed and in both of these patients, the fixation was done through the external wound of initial injury. No case of implant infection through intra-oral approach was found. We used the stainless steel implants instead of titanium implants which was due to the financial constraints and unavailability of titanium implants. Similarly, biodegradable/ resorbable implants were also not used which have an added benefit of non-infective and these are not to be removed secondarily.²⁰⁻²¹

CONCLUSION

Facial fractures may result in serious cosmetic and functional deformity. Mandible is the most common facial bone to be fractured. Patients with maxillofacial fractures must undergo early interventions including reduction, stabilization of fractures as well as bone/cartilage grafting (if necessary) to have better results. Knowledge of traffic laws and implementation of Helmets and seats belts should be mandatory to avoid such drastic facial injuries.

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