

# MAXILLOFACIAL TRAUMA: CURRENT PRACTICE IN MANAGEMENT AT PAKISTAN INSTITUTE OF MEDICAL SCIENCES

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**Background:** This study was carried out to determine the aetiology, pattern and management of maxillofacial injuries at PIMS, Islamabad. **Methods:** This descriptive study was conducted at Plastic Surgery Department, PIMS Islamabad from 1<sup>st</sup> February 1998 to 30<sup>th</sup> April 2002. All the adult patients presenting with maxillofacial injuries were included where as patients less than 12 years of age and only facial lacerations were excluded. Similarly isolated nasal bone fractures were also excluded because these patients were routinely managed by ENT department. Age, sex, presentation, aetiology, associated injuries and treatment modalities undertaken in these patients were recorded. **RESULTS:** In 164 patients 254 fractures were noted. Most were male (86%), ranging in age from 13–71 years with a male to female ratio of 6:1 respectively. The most frequent (48%) cause noticed was road traffic accidents followed by assault. Mandible was the commonest to be involved in such injuries followed by maxilla. Most of the patients (32%) had associated facial injuries. Various treatment modalities were practiced. **Conclusion:** Maxillofacial fractures should be managed by open reduction and internal fixation as early as possible.

**Key Words:** Maxillofacial, Trauma, Mandible, Management

## INTRODUCTION

Maxillofacial trauma is presented in Accident and Emergency Department of the hospital as isolated injuries or part of poly trauma<sup>1</sup>. Maxillofacial trauma can be limited to superficial laceration or abrasion or it may be associated with multiple injuries to the chest, head, cervical spine, abdomen or the extremities<sup>2</sup>. It not only hampers the function but also causes serious psychological and cosmetic deficiencies<sup>2</sup>. 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<sup>2</sup>. The frequency of facial injuries is high because face is exposed and because there is little protective covering<sup>3</sup>. A unique aspect of facial injuries is that the restoration of appearance may be the chief indication for the treatment<sup>3</sup>. The treatment of such injuries is accomplished in three phases. The primary phase deals with survival of the patient by maintenance of haemodynamics 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<sup>4</sup>.

Epidemiological studies of maxillofacial trauma have classically shown that young adult males are the predominant victims<sup>5</sup>. Maxillofacial injuries are not uncommon in Pakistan<sup>6</sup>. A compromised cosmetic, functional, and psychological outcome may result when these components of successful treatment are not practiced<sup>7</sup>.

This study was conducted to determine the aetiology, pattern and management of maxillofacial injuries at PIMS, Islamabad.

## MATERIAL AND METHODS

This descriptive study was conducted at Plastic Surgery Department of PIMS Islamabad from 1<sup>st</sup> February 1998 to 30<sup>th</sup> April 2002. All the adult patients presenting with maxillofacial injuries were included where as patients less than 12 years of age and only facial lacerations were excluded. Similarly isolated nasal bone fractures were also

excluded because these patients were routinely managed by ENT department. Age, sex, presentation, aetiology, associated injuries and treatment modalities undertaken in these patients were recorded.

Almost all of the patients presented in Accident and Emergency Department. The management started with ATLS (Advanced Trauma Life Support) including the maintenance of air way, control of bleeding, antibiotic coverage and head end elevation at 45°. Barton’s bandage was applied to achieve the normal occlusion wherever possible. Regular mouth washes and liquid diet were advised. In all cases plain x-rays, i.e., OPG (orthopantomogram), Water’s view or CT scan were obtained when possible. Majority of the patients were operated on routine lists. Inter Maxillary Fixation (IMF) was done in isolated mandibular fractures when the pre-injury occlusion was achieved easily under local anaesthesia (infraorbital and mental nerve blocks) and intra venous sedation. It was done with cortical screws and 27 Fr dental wires. It remained there for 4–6 weeks. During this period the patients remained on liquid diet.

Two or more mandibular fractures with or without flail segments, maxillary, zygomatic, orbital rim fractures were approached via intra-oral route (gingivolabial incision). Rarely only those fractures were approached from external wound when it lied on the line of fracture not closed primarily. All these patients were operated under general anaesthesia with north nasal intubation. Nasogastric intubation was done for 24 hours to avoid vomiting and accidental aspiration.

Descriptive statistics were used to calculate percentages.

## RESULTS

In 164 patients, 254 fractures were noted. Most of the patients were males (86%) with a male to female ratio of 6:1 and age ranging from 13–71 years (mean 36.4 years).

The most frequent (48%) cause noticed was road traffic accidents followed by assault (Table-1).

**Table-1: Aetiology of Maxillofacial Injuries (n=164)**

Cause	Patients	%
Road Traffic Accidents	78	47.6
Assault	49	29.9
Domestic Accidents	21	12.8
Industrial Accidents	9	5.4
Gunshot	6	3.7
Sports Injuries	1	0.6

Mandible was the commonest to be involved in such injuries followed by maxilla (Table-2).

**Table-2: Areas Involved in Maxillofacial injuries**

Areas/Bones	Patients	%
Mandible	132	62.9
Zygoma	28	13.3
Maxilla	24	11.4
Orbit	12	5.7
Temporo-parietal region	8	3.8
Frontal bone	6	2.9

Most of the patients (34%) had associated facial injuries (Table-3).

**Table-3: Associated injuries**

Injuries	Patients	%
Facial lacerations	56	32
Head injury	38	21.7
Limb injury	35	20
Nasal bone involvement	23	13.2
Chest/Abdominal injuries	16	9.1
Cervical spine injuries	7	4

Various treatment modalities were practiced (Table-4).

**Table-4: Operative Procedures**

Operative Modality		Patients	%
IMF		96	37.8
ORIF		28	11
ORIF+IMF	Microplates	8	3.1
	Lag screws	12	4.7
	Dynamic compression plate	4	9.4
	Reconstruction plates	16	6.3
	Mesh plates	8	3.1
	Kirschner wiring	4	1.6
	Interosseous wiring	24	9.4
Arch bar/Eyelets		34	13.5

ORIF= Open Reduction and Internal Fixation

IMF= Inter Maxillary Fixation

## DISCUSSION

Trauma is the principle cause of mortality and morbidity. The most common site of fracture is mandible. The aetiology, type and site of maxillofacial fractures vary depending on many factors<sup>8</sup>. Maxillofacial injuries vary from soft tissue lacerations to complex fractures of maxillofacial skeleton. Mandible, being the most prominent bone in face, is often fractured more than the strongly supported middle third of the face<sup>7</sup>. These mandibular fractures account for 35–45% of panfacial trauma<sup>9</sup>.

The incidence of maxillofacial injuries varies with age, region, a period of time, climatic conditions, socio-economic differences, traffic volume, road traffic accidents and preventive measures taken in different countries<sup>10-12</sup>.

**Table-5: Post Operative Complications**

Complications	Patients
Palpable plates	18
Pain	12
Lower lip anesthesia/hyposthesia	12
Malocclusion	7
Infection	4
Breakage of plates	2

Maxillofacial injuries are not uncommon in Pakistan. Being a male dominant society, the males work out doors and hence are more susceptible to accidents. The same observation was noticed in other studies<sup>6,13</sup>. The most common were the middle aged males (Mean age 34.4 years).

The present study shows that the most common cause of facial injuries was road traffic accidents, which is consistent with the observations in other studies carried out in Pakistan<sup>9,13</sup> and also in other countries<sup>14,15</sup>.

The number of cases increased gradually during the four years period (Figure-1). In facial fractures commonest was the involvement of mandible (62.9%).

**Fig-1: Yearly Cases of Maxillofacial trauma**

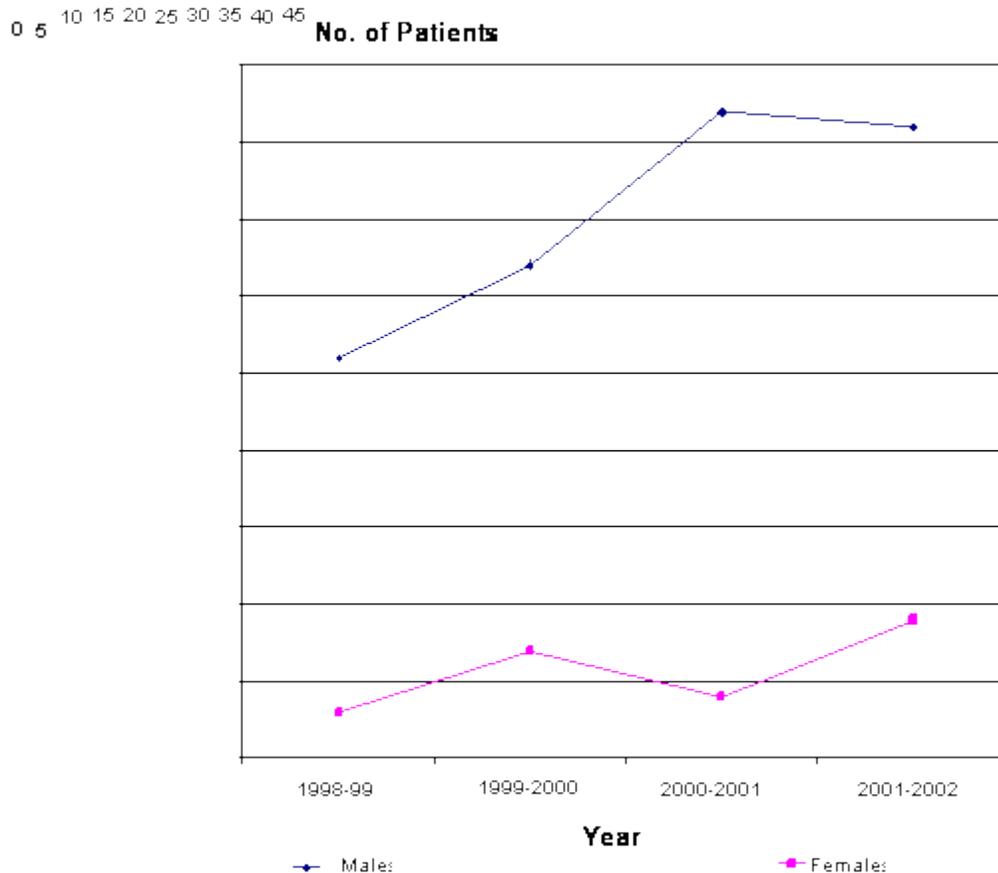
0  
5  
10  
15  
20  
25  
30  
35  
40  
45  
1998-99  
1999-2000  
2000-2001  
2001-2002

**Year**

Males

Females

**No. of Patients**



Majority of the patients in present study had the associated injuries treated concomitantly. These features were not included in some of the other studies carried out in Pakistan<sup>6,13</sup>. Facial lacerations were closed primarily and patients having the element of head injury were observed and treated by the active participation of the neurosurgery department. Intra oral approach was preferred leaving no residual scar.

Simple method of reduction and immobilization were employed for isolated mandibular fractures for most of the cases whereas other modern modalities of open reduction and internal fixation were also used (which included lag screws, dynamic compression plates, reconstruction plate mini plates, micro plates). Interosseous wiring was also done in 18 cases in early period of study when the other modern modalities of ORIF were not available. Two patients had a lost segment of mandibular body after gunshot injury for which iliac bone graft was harvested and fixed with the dynamic compression plate.

Patients who were managed by only IMF, had a longer duration (4–6 weeks) of immobilization as compared to the patients having ORIF+IMF (3–4 weeks). Far superior results were obtained in only ORIF because of normal mobilization of jaw from the day of surgery and maintenance of weight.

The complications were a few including post-operative pain (7%), malocclusion (4%). In two cases, breakage of reconstruction plate occurred. Plates were palpable in 10.9% of cases. In 12 patients the mental nerve was severed resulting in unilateral lower lip anaesthesia/hypoaesthesia. Ideally we should use the Titenium implants instead of Stainless steel implants. But due to financial constraints of the patients we were bound to use the Stainless steel implants, which resulted in a relatively high complications rate.

Being a developing country, the socio-economic status of the majority is low. Moreover, the patients came to PIMS, being a tertiary care centre, from far flung areas. All these factors contributed to the irregular follow up of the patients. But the available data showed the outcome of the patients was satisfactory and up to the mark.

Most of the accidents occur in the rush hours. The laws regarding the precautions (like seat belts, speed limits, traffic education etc) are not observed. The vehicles are not checked and given proper attention due to obvious socio-economic conditions. All these factors result in increasing the number of road traffic accidents. Now a days in developed countries, to avoid the secondary removal of plates, bioabsorbable plates system has been developed for use in craniomaxillofacial surgery<sup>15</sup>.

The commonest cause of maxillofacial injuries in our study was road traffic accidents compared to other study<sup>8</sup>. But the reason of accidents in our country is due to socioeconomic conditions and violation of traffic rules whereas in developed countries, accidents are mostly due to alcoholic intoxication<sup>8</sup>.

Maxillofacial injuries may cause serious cosmetic and functional deformities. Patients with these injuries are candidates of number of operations. We conclude that early interventions including reduction, stabilization of fractures as well as bone or cartilage grafting (if necessary) will decrease the number of operation and healing period. We also recommend open reduction and internal fixation for maxillofacial fractures should be undertaken whenever possible.

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