

# Retrospective Analysis of Etiology, Incidence and Management of Facial Trauma Over 5 Years in North India: A Clinical Audit

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## ABSTRACT

**Aim:** To analyze etiology, incidence and management of facial trauma over a period of 5 years in a tertiary care center in North India.

**Materials and methods:** Records of 195 patients with 274 facial fractures were analyzed retrospectively from 2009 to 2013. Fractures were classified according to anatomical area involved (zygoma, maxilla, mandible, teeth), and etiology was divided into road traffic accidents (RTAs), falls, sports injuries and assaults. It was found that RTA was most common etiologic factor for facial trauma, followed by falls, assaults and sports injuries. Mandibular fractures were most common, followed by midface fractures and dental injuries. Various treatment options were also evaluated.

**Results:** Mandibular fractures were more common than midface fractures. Most common line of treatment was open reduction and internal fixation with mini-plate fixation. Mandible reconstruction was done in one case of bone defect following a gun-shot injury. Coronoidectomy had to be performed in one case of zygoma fracture.

**Conclusion:** Patient's best interest, affordability and general well being should be kept in mind while managing trauma of maxillofacial region. Surgeon should utilize his knowledge to the best possible level as any injury to this region has a direct impact on psyche as well as general well being of patient.

**Keywords:** Clinical audit, Oral and maxillofacial surgery, Facial trauma.

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## INTRODUCTION

The injuries to the maxillofacial region are of significance as this region gives protection to the cranial cavity and its contents from the front, and also as this region is associated with appearance, and other vital functions, such as eating, hearing, seeing, smelling and tasting, having a direct impact on the person's quality of life.<sup>1</sup>

The first analysis of facial injuries was done in 1962.<sup>2</sup> A number of studies have been done since then examining the epidemiology of facial fractures.<sup>3-5</sup>

The present study examines the records of 195 patients with facial fractures in a tertiary care center in North India, from 2009 to 2013, reviewing the mechanism of injury, age and sex of the patient, the type of injury and the treatment provided.

## MATERIALS AND METHODS

The records of 195 patients with 274 facial injuries in a tertiary care center in North India, from 2009 to 2013 were reviewed. The history, clinical examination, radiographic examination, diagnosis and treatment were confirmed through the records.

The parameters evaluated, based on the records, are as under:

- Age of the patient
- Sex of the patient
- Etiology of trauma
- Anatomical area involved
- Treatment.

## RESULTS

Majority of the subjects in this study were found to be males, with male to female ratio being about 6:1 (167 males, 28 females), which is in between those reported by various studies (2:1 to 9:1).<sup>1,6</sup> Males are more prone to trauma due to their outdoor activities, aggressive driving and alcoholism<sup>6</sup> (Table 1).

The youngest patient was 1-year-old, whereas the oldest was aged 86 years (average age 31.6 years). The most commonly involved age group was 20 to 40 years (99 patients, 50.77%), followed by 40 to 60 years (44 patients, 22.56%) (Table 2).

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Road traffic accident (RTA) was the most common etiological factor, accounting for 154 injuries (78.97%), followed by falls (27 injuries, 13.85%), which is in accordance with Adeyemo et al<sup>7</sup> (Table 3).

One hundred and ninety-one patients (77.44%) reported within first 3 days of injury, whereas the rest (22.56%) reported more than 3 days after the trauma (Table 4).

Sixty-eight patients (34.87%) had more than one type of facial fracture, with mandibular fractures (155 fractures, 56.57%) being more common than the midface fractures (114 fractures, 41.61%) (Table 5).

The most common sites for mandibular fractures were parasymphysis (46 fractures, 29.68%) and condyle (45 fractures, 39.03%), followed by angle (28 fractures, 18.06%), body (24 fractures 14.48%), symphysis (6 fractures 3.87%), dentoalveolar (3 fractures, 1.94%), ramus (2 fractures, 1.29%) and coronoid (1 fracture, 0.65%) (Table 6). Zygomatic fracture (66 fractures, 29.68%) was the most common midface fracture, followed by maxilla fractures (20 fractures, 13.89%) LeFort II fractures (10 fractures, 6.94%), LeFort I fractures (9 fractures, 6.25%), dentoalveolar (8 fractures, 5.55%) and LeFort III fractures (1 fracture, 0.69%) (Table 7).

Among the dental injuries, three patients had avulsed teeth, one patient had tooth intrusion and one had tooth fracture (Ellis class III).

Regarding the treatment modalities used, open reduction was done in majority of the cases and fixation was done using miniplates (106 cases, 54.36%). Transosseous wiring was done in 2 cases (1.03%). Sixty cases (30.77%) were treated through closed reduction using arch bars, and 21 patients (10.77%) required no active intervention as the fractures were undisplaced. In one case, mandible was reconstructed using a reconstruction plate as there was bone defect present following a gun-shot injury. Coronoidectomy had to be performed in one case of zygoma fracture as the patient reported with a malunited zygomatic fracture 3 months after the injury as was having difficulty in mouth opening as the coronoid process was impinging upon the depressed zygomatic bone. In patients with avulsed teeth, splinting of the teeth back into their original position was done. The patient with fractured tooth underwent root canal treatment for the affected tooth (Table 8).

## DISCUSSION

The present study analyses the patients with injuries to the maxillofacial region, from the years 2009 to 2013. It was seen that road traffic accidents (RTAs) were the most common etiological factor of maxillofacial trauma, followed by falls. This is in accordance with various studies in India as well as other countries.<sup>1,8,9</sup> Fractures of

**Table 1: Gender**

Gender	Number	Percentage
Male	167	85.64
Female	28	14.36
Total	195	100

**Table 2: Age groups**

Age groups	Number	Percentage
Less than 20	38	19.49
20-40	99	50.77
40-60	44	22.56
More than 60	14	7.18
Total	195	100

**Table 3: Etiology**

Factor	Number	Percentage
RTA	154	78.97
Fall	27	13.85
Assault	7	3.59
Sports injury	7	3.59
Total	195	100

**Table 4: Time of reporting**

Time	Number	Percentage
Within 3 days	151	77.44
After 3 days	44	22.56
Total	195	100

**Table 5: Different injury sites**

Bones	Number	Percentage
Mandible	155	56.57
Maxilla	28	10.22
Zygoma	66	24.09
LeFort I	09	3.28
LeFort II	10	3.65
LeFort III	01	0.37
Dental injuries	05	1.82
Total	274	100

**Table 6: Mandible fracture sites**

Fracture	Number	Percentage
Parasymphysis	46	29.68
Condyle	45	29.03
Angle	28	18.06
Body	24	15.48
Midsymphysis	06	3.87
Ramus	02	1.29
Coronoid	01	0.65
Dentoalveolar	03	1.94
Total	155	100

the mandible were more commonly observed, a finding consistent with Singh et al,<sup>1</sup> which may be due to the fact that the mandible is a more prominent bone than the strongly supported bones of the middle third of the face.

Regarding the treatment modalities used, open reduction and internal fixation was the most commonly used



**Table 7:** Midface injury sites

Fracture	Number	Percentage
Zygoma	66	57.89
Maxilla	20	17.54
LeFort I	09	7.89
LeFort II	10	8.78
LeFort III	01	0.88
Dentoalveolar	08	7.02
Total	114	100

**Table 8:** Treatment modalities

Treatment	Number	Percentage
Open reduction and plate fixation	106	54.36
Transosseous wiring	2	1.03
Closed reduction	60	30.77
Conservative management	22	11.28
Reconstruction	01	0.51
Splinting	03	1.54
Coronoidectomy	01	0.51
Total	195	100

modality, and it has been proven to be the most effective method for treating mandibular fractures (Ajmal et al).<sup>10</sup> However, according to Danda et al, no significant clinical difference exists between patients undergoing closed reduction and open reduction with internal fixation.<sup>11</sup>

Minimally, displaced fractures can be managed conservatively or by closed reduction, as described by Singh et al.<sup>1</sup> The cases with extensive displacement have to be treated with open reduction.<sup>12</sup> However, patients with underlying neurological deficit, spinal injuries or medically compromised patients can be managed conservatively, keeping in mind the patient's well being. In epileptic patients, intermaxillary fixation for the management of fractures cannot be done.

## CONCLUSION

The present study describes the etiology, incidence, time of reporting, area involved and the treatment imparted to maxillofacial trauma patients. The patient's best interest, affordability and general well-being should

be kept in mind while managing maxillofacial trauma. In handling trauma patients, the maxillofacial surgeon should utilize his knowledge to the best possible level as any injury to this region has a direct impact on the psyche as well as the general well-being of the patient.

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