

# A Comprehensive Retrospective Analysis of Pattern of Midfacial Fractures among Patients of a Dental Institute in Northern India

## Abstract

**Aim and Objective:** The present study aims to appraise the etiology, pattern, gender and anatomical distribution for managing mid face fractures over a period of 3 years between October 2010 to December 2013. **Materials and Methods:** The study was compared with the existing literature on the subject. Data of 55 cases was analyzed based on etiology, age group, gender, and anatomical distribution. **Results:** The most common anatomic site is zygomatico maxillary complex (31%). Males are more affected than females with the peak incidence rate occurring in 25-35 years of age group. The most common etiological factor is RTA (52.7%) followed by falls (32.7%), assaults (7.27%), sport injuries (5.45%) and gunshot wounds (1.81%). **Conclusion:** Thus we conclude that RTA is the leading cause of mid face fractures and males are more affected. The most common site is zygomatico maxillary complex fracture. We observed that etiology for the fractures was significantly associated with dentoalveolar ( $p=0.002$ ), nasal ( $p=0.014$ ) and Le Fort II with mandibular fracture ( $p=0.010$ ) and a significant relationship was observed between marital status and LeFort I with mandibular fracture ( $p=0.027$ ).

## Key Words

Retrospective; midface; fractures; dental

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## INTRODUCTION

In the present era trauma of the maxillofacial region is common which leads to an increase of these cases in hospital settings. This region comprises a complex anatomical arrangement of bones and soft tissues making injuries affecting this region one of the most challenging problems facing oral surgeons. This is one of the most frequently injured areas of the body, accounting for 23–97% of all facial fractures<sup>1</sup> and bones of the middle third of facial skeleton are so fragile that they tend to split easily. There is a remarkable variation in the etiology, incidence, sex, age, and site distribution of fractures depending upon the geographic conditions, cultural characteristics, and socioeconomic trends<sup>2–7</sup>. The face is more prone to trauma as it is the most

exposed part, and may be associated with other skeletal and soft tissue injuries of the body<sup>8</sup>. Injuries to the maxillofacial region have increased in frequency and severity because of the heavy reliance on road transportation and the increased mobility for socioeconomic activities of the population<sup>9–11</sup>. This study aims to analyze retrospectively, the age and gender distribution, etiology and anatomic distribution of mid face fractures among patients who visited Jodhpur Dental College and Hospital, Jodhpur, Rajasthan in a 3year period of time.

## MATERIALS AND METHOD

Before the start of the study ethical clearance was obtained from the ethical committee of the institutional review board of Jodhpur Dental

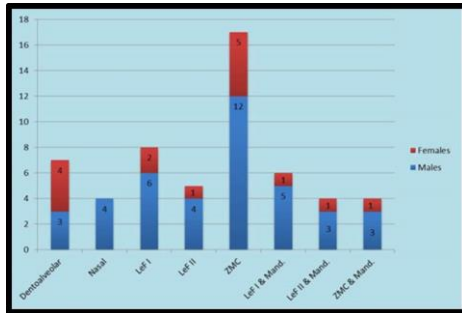


Fig. 1: Distribution of fractures sites among males and females.

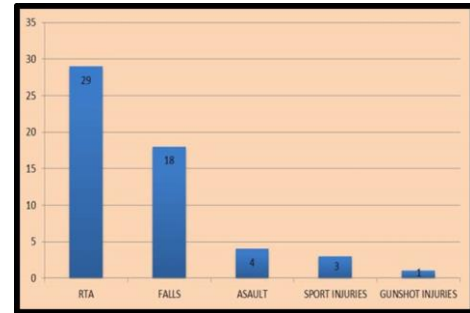


Fig. 2: Distribution of Maxillofacial fractures on the basis of the Etiology of fractures

**Table 1: Association between Distribution of fracture anatomic site and Demographic variables and Etiology of fractures**

Distribution of fracture anatomic site	Age		Gender		Etiology		Residence		Marital status		Education		religion	
	$\chi^2$ value	p-value	$\chi^2$ value	p-value	$\chi^2$ value	p-value	$\chi^2$ value	p-value	$\chi^2$ value	p-value	$\chi^2$ value	p-value	$\chi^2$ value	p-value
Dentoalveolar	3.608	0.058	1.222	0.269	16.487	<b>0.002</b>	0.04	0.952	0.146	0.702	1.020	0.796	1.456	0.228
Nasal	1.618	0.203	0.255	0.613	12.560	<b>0.014</b>	3.100	0.078	2.465	0.116	3.432	0.380	0.456	0.500
Le Fort I	.024	0.876	2.616	0.106	1.596	0.809	0.072	0.789	0.522	0.116	2.622	0.454	0.036	0.849
Le Fort II	.147	0.702	0.770	0.380	1.848	0.764	0.747	0.387	1.328	0.249	0.051	0.997	1.576	0.209
ZMC	.057	0.812	0.821	0.365	2.782	0.595	1.251	0.263	0.246	0.620	2.165	0.539	0.287	0.592
Le Fort I & Mandible	.382	0.537	2.315	0.128	9.231	0.056	1.709	0.191	<b>0.027</b>	0.870	1.072	0.784	0.952	0.329
Le Fort II & Mandible	.011	0.916	2.664	0.103	13.384	<b>0.010</b>	0.501	0.479	0.241	0.624	6.626	0.085	0.456	0.500
ZMC & Mandible	0.011	0.916	0.318	0.573	1.112	0.892	3.100	0.078	0.347	0.556	2.945	0.400	0.456	0.500

College and General Hospital. The data for this study were obtained from the medical records of 55 patients treated at Jodhpur Dental College and Hospital, Jodhpur, Rajasthan during the 3 year period between October 2010-December 2013. Information was collected from the clinical and surgical notes of the patients in a standardized and systematic pattern. The demographic variables like age, gender, religion, education and residence. Clinical information included diagnosis, etiology and anatomical distribution of mid face fractures were assessed.

**RESULTS**

From this study we observed that etiology was significantly associated with dentoalveolar (p=0.002), nasal (p=0.014) and Le Fort II with mandibular fracture (p=0.010) and there existed a significant relationship between marital status and LeFort I with mandibular fracture (p=0.027) (Table 1). In this study, total number of patients with mid face fractures were 55. The anatomic distribution of fracture was as follows zygomatico maxillary complex 17 (31%), Maxillary LeFort I 9 (16.36%), dentoalveolar 7 (12.7% ), LeFort II 4 (7.27%), nasal 4 (7.27%), Le Fort I with mandibular 6 (10.9%), Le Fort II with mandibular 4 (7.27%), zygomatico

maxillary complex with mandibular 4 (7.27%). Males 40 (72.7%) were more prone to injuries (Fig. 1). The cause of fracture was RTA 29 (52.7%), followed by falls 18 (32.7%), assaults 4 (7.27%), sport injuries 3 (5.45%) and least was gunshot wounds 1 (1.81%). Now-a-days because of increased number of vehicles RTA was the most common factor (Fig. 2).

**DISCUSSION**

Fractures of the midfacial region occur most often because of automobile collisions, industrial or other accidents and fights resulting in trauma of maxilla, nose, zygoma and at times the mandible. These fractures may involve important adjacent structures like nasal cavity, maxillary antrum, orbit, cranial nerves, major blood vessels and the brain, with disastrous consequences.<sup>[12]</sup> In the majority of the cases analyzed it was found that the mean peak age was 25-35 years. The patients were divided into two groups. Group I below 25 years and Group II above 25 years. Most of our cases were in Group II. These findings are similar to other studies.<sup>[6,13-15]</sup> It has been shown that, in general, young are affected more from trauma than the elderly<sup>[16,17]</sup> the reason being that as the person attains adulthood, he is more energetic, interested in fast and rash driving,

participate in various outdoor activities outside the confines of his childhood environment leading to more chances of suffering from maxillofacial injuries. In the current study, Road Traffic Accident was the commonest cause and made up of all the incidences which favor earlier studies from around the world.<sup>[16,18,19]</sup> A WHO statistical report indicated that every year nearly a million people die and between 15 and 20 are injured due to Road Traffic Accidents.<sup>[20]</sup> This was due to increased vehicular traffic with high speed, static road conditions, non-compliance of road traffic regulations. Present study revealed that males are more affected than females which also favor previous studies.<sup>[7,17,21,22]</sup> Males are more involved in outdoor activities than females and majority of drivers are males. The zygomatic bone is most commonly affected in our study due to its prominence, vulnerability during traffic accidents and greater exposure to external trauma, as in other studies.<sup>[23-26]</sup> In the present study zygomatic complex fracture was associated with mandibular fractures because of the intimate association of the zygomatic complex with the rest of the facial skeleton which co-relates with past studies.<sup>[27-29]</sup> The second most common site is maxillae<sup>[30-32]</sup> followed by dentoalveolar fractures and nasal fractures. The incidence of nasal fractures were less probably because patients were treated by ENT surgeons, which, is in agreement with other authors<sup>[21,33-35]</sup> but in contrast to study by Hussain *et al.*<sup>[36]</sup> The number of dentoalveolar fractures were less compared to maxillary fractures which is contrary to study by Jessica *et al.*<sup>[37]</sup> The combined maxillary and mandibular fractures were 10 (18.18%) which is very similar to Klenk *et al.*<sup>[38]</sup> In our study we observed that majority of patients were rural and had low education level (illiterate and primary school) which favors the study by Junior JCM *et al.*<sup>[39]</sup> In the literature it is reported that rural population is more affected due to lack of education.<sup>[40-42]</sup> With respect to religion we have divided our patients into two main groups i.e. Group I Hindus and Group II Others. The cause and incidence of maxillofacial fracture varies according to geographic region, culture, socioeconomic status and religion.<sup>[43,44]</sup>

## CONCLUSION

We have concluded from the aforementioned study that the mid face fractures were more common in males with the highest percentage in 25-35 years age group. Road Traffic Accident was the most common cause of fracture followed by falls. It was

observed that zygomaticomaxillary complex was the most common site. The fractures were more among the rural population with low socioeconomic and literacy level. There is a need to reinforce legislation regarding safety traffic rules strictly to minimize the injuries. It is suggested that schools across the country should emphasize the importance of safe traffic rules to the young generation for a healthy and better tomorrow to live in.

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