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STUDY OF FACIAL BONE FRACTURES FOLLOWING ROAD TRAFFIC ACCIDENTS: A LONGITUDINAL STUDY

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Abstract

Background: Aim-The aim of study was to evaluate the prevalence of maxillofacial fracture following road traffic accidents, to access the pattern of maxillofacial fracture and to estimate the most common type of facial fracture following road traffic accidents in patient attending a tertiary health care center. **Materials and methods:** Patient coming to ENT OPD and casualty of Shri Vasantrao Naik government medical college Yavatmal with facial bone fractures following RTA, were evaluated in this study. **Results:** Total 140 patients were evaluated with facial bone fracture after RTA. The prevalence of facial fracture in RTA patient is 11.2%. Majority of them were in age group of 21 to 40 years. Male preponderance was seen. Most common facial fracture was mandible 48.5%, followed by nasal bone 18.5%, ZMC 17.1%, multiple bone fracture 10.7%. Among all mandible fractures 47.19% had parasymphysis fracture. Two wheeler accidents were majorly seen 47.1%, 33.6% four wheeler, 16.4% pedestrians and 2.9% three wheeler. Among the 2 wheeler drivers, majority 78.8% were not wearing helmets. Majority 60.7% cases needed surgery and 39.3% were treated conservatively. Among surgical cases 12.9% of cases had complication following surgery. **Conclusion:** On the basis of data which was reproduced after examination of 140 patients, having RTA with facial bone fractures attending tertiary care hospital, it is concluded that most common fracture following RTA is mandible. In mandible, the most common site is parasymphysis. Two wheeler accidents were majorly seen. Majority of patients were under influence of alcohol. Majority of them were not wearing helmets.To avoid RTA, it is important to implement stringent traffic rules, improving the quality of roads, safety regulation rules should be followed. ORIF being the main stay of treatment in present study followed by IMF.

Keywords: Facial bone, Facial fracture, Road traffic accident.

Introduction

Facial injuries are commonly involved along with other injuries in the emergency department. Face is one of the exposed parts of our body and is highly prone for traumatic injury. Trauma to the facial region involves skeletal, dental and soft tissue components of the face. Maxillofacial region composed of frontal bone, nasal bone, zygomatic bone,midface (Le fort fracture), mandible(lower jaw).

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Motor vehicle accidents, accidental injuries, and falls[1] comprise the majority of causes for complex facial wounds. All traumatic facial injuries require radiographic assessment, usually in the form of computed tomography.[2,3] The severity of trauma depends on magnitude of impact force, its duration, acceleration produced, impact, and surface area on which impact occurs along with the etiology and mechanism of injury. Maxillofacial trauma may or may not be associated with other systemic injuries, thus multidisciplinary approach is required for their management. In the developing world, RTAs still account for the majority of maxillofacial trauma,[4-7] but the introduction of seat-belt and drunk-driving legislation and improvements in car design have greatly decreased the incidence of fatalities and RTA-associated maxillofacial trauma.[8,9] Most encouragingly, the percentage of all facial fractures associated with RTAs has decreased from 46.8% in 1948 to 18.6% over the same period.(10)The scientific evidence that helmets protect against head, brain, and facial injuries in motorcycle and bicycle accidents has been well established by multiple, well-designed, case control studies.[11,12] Helmet use by motorcycle riders not only decreases the risk of facial injuries by more than 50% but also is associated with fewer fractures and a decreased number of moderate and severe systemic injuries. The incidence and severity of facial injuries vary greatly in different parts of the world, and in some countries RTAs are still the most common cause of facial fractures.(13,4-7) Fractures of the nasofrontoethmoidal region accounts for approximately 5% of the facial fractures.(14) Excluding nasal fractures, the midface is involved in approximately 40% of cases.[15] The basic principle of fracture management is open/closed reduction, fixation, and immobilization.

However, treatment outcome depends on other factors such as type of fractures, degree of injury, maxillofacial surgeon expertise, experience, and the available technology, Over the past two decades, the epidemiology of maxillofacial trauma along with different variations in etiology, pattern of injuries, and their management have been constantly changing, hence continuous efforts in documenting these injuries and to follow the changing pattern of their management is required. There are many epidemiological studies has been done on maxillofacial trauma in different population and parts of India. An increased and updated knowledge of the cause and severity of facial trauma will help in effective treatment and preventive measures of maxillofacial trauma. Hence, this study will be beneficial to evaluate the prevalence and pattern of maxillofacialinjury.

Materials And Methods

Patient coming to ENT opd and casualty of Shri vasantrao Naik government medical college, Yavatmal from dec 2020 to dec 2022 with clinical symptoms like pain, facial oedema, facial asymmetry, restriction of mandibular mobility and derranged occlusion, that
suggestive of fracture, and patient coming with radiological report suggestive of facial fracture were evaluated further by taking detailed history of patient and general, local and systemic examination was done.Radiological investigation like x ray and CT was done. Informed written consent is obtained from each patient and data is collected andanalysed.

Inclusion Criteria-

1. Patients of all ages irrespective of gender proportion.
2. Patient having radiological reports suggestive of facial fracture following roadtraffic accidents.
3. Patient willing to consent for study.

Exclusion Criteria-

1. Patient with soft tissue injury and dentoalveolar involvement.
2. Patient having injuries other than facial injury like head injury.

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3. Facial injury with assault, fall and sport injury.

Ethical approval was obtained. The data collected from patient includes age, gender, type of fracture, management and complication.

Result And Discussion

In this study total 140 patients were evaluated.

Table 1 shows the prevalence following facial fracture in patient of RTA was 11.2%. Majority of the patients were in age group of 21 to 40 years (60%) followed by 41 to 60 years (23.6%), than below20 years (12.1%), than above 60 years(4.3%) as depicted in Table 2.

Majority of patients were male 83.6% and females were 16.4%.

Table 4 shows, that most common facial fracture following RTA was mandible (48.5%), followed by nasal bone (18.5%), ZMC (17.1%), multiple bone fractures (10.7%), lefort 1 fracture (2.8%), maxilla fracture (1.4%) and lefort 2 fracture (0.7%).

As depicted in Table 5, in mandible, the most common site of fracture was parasymphysis (47.19%), followed by fracture at multiple site 41.6%, than 25% had symphysis fracture, 18.75%at angle of mandible fracture, 4.16% at condyle and body fracture each.

As shown in Table 6, most common vehicle involved in RTA leading to facial fracture was two wheeler 47.1%, 33.6% had four wheeler, 16.4% were pedestrians and 2.9% had three wheeler. Table 7 depicts, that among the 2 wheeler drivers, i.e. 66 patients, majority, 52 patients, (78.8%)of them were not wearing helmets.

Table 8 shows that, out of 140 patients, 91 patients (65%) were under influence of alcohol. As depicted in Table 9, majority of patients were managed surgically 60.7% i.e. 85 out of 140 patients and rest were managed conservatively(39.3%).

As shown in Table 10, out of 85 patients, 68 were managed with open reduction and internal fixation and 17 patient were managed with internal medullary fixation.

Table 11 shows complication following surgical management in 11 patient out of 85 patient who were managed surgically. As depicted in Table 11, most common complication noted following open reduction and internal fixation was surgical site infection and nerve injury, four patient each, i.e 36.6 % each. And 3 patient out of 11 patient had occlusion derrangement following open reduction and internal fixation. They were managed with elastic wiring for four weeks andreviewed after four weeks.

Out, of four patient with nerve injury 3 patient complains of tingling sensation or numbness over lower lip, these are patient of parasymphysis of mandible fracture, and managed conservatively with iv steroids in tapering doses. One of the patient with left angle of mandible and right parasymphysis fracture had left marginal mandibular nerve injury following open reduction and internal fixation was managed with intravenous steroids in tapering doses.

Table 1: Prevalence of facial fracture out of total RTA

Facial fracture	**Cases**	**Percentage**
YES	248	11.12
NO	1982	88.8
Total RTA	2230	100

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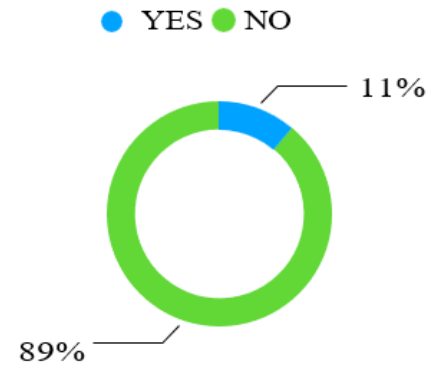

Figure 1

Table 2: Age distribution

Age in years	Patient	Percentage
<20	17	12.1
21-40	84	60
41-60	33	23.6
>60	6	4.3
Total	**140**	**100**

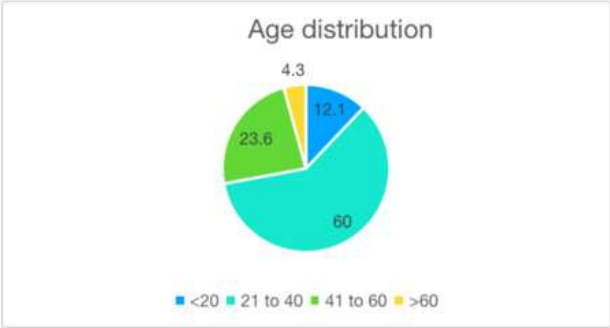

Figure 2

Table 3: Gender

Gender	Patient	Percentage
Male	117	83.6
Female	23	16.4
Total	**140**	**100**

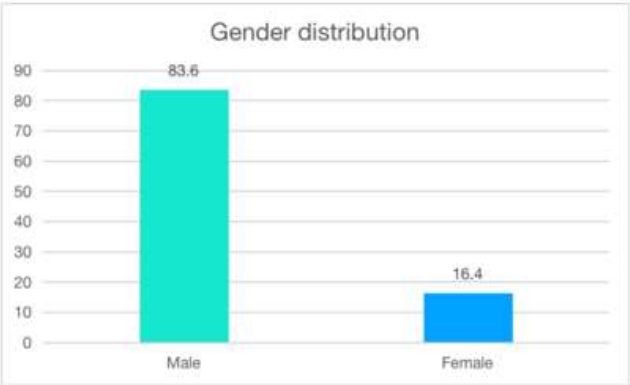

Figure 3

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Table 4: Fracture pattern

Fracture pattern	Patient	Percentage
Mandible	68	48.5
Nasal	26	18.5
Zygomatic complex	24	17.1
Multiple bone fractures	15	10.7
Maxilla fracture	2	1.4
Lefort 1 fracture	4	2.8
Lefort 2 fracture	1	0.7
Total	**140**	**100**

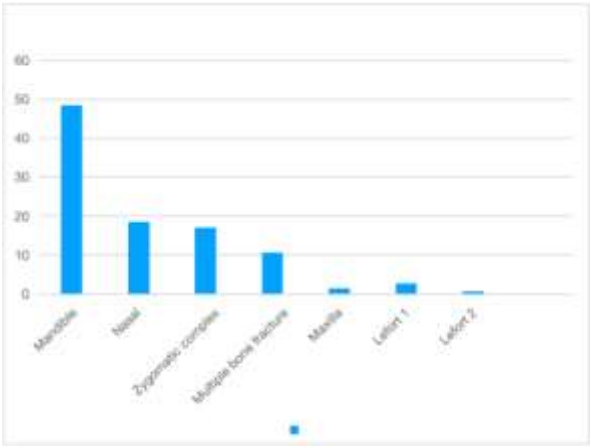

Figure 4

Table 5: Location of mandible fracture (n=68)

Location of mandible fracture	Patient	Percentage
Parasymphysis	23	47.19
Symphysis	12	25
Angle	9	18.75
Condyle	2	4.16
Body	2	4.16
Subcondyle	0	0
Multiple sites	20	41.6

Location of mandible fracture	Patient	Percentage
Body	2	4.16
Subcondyle	0	0
Multiple sites	20	41.6
Total	**68**	**100**

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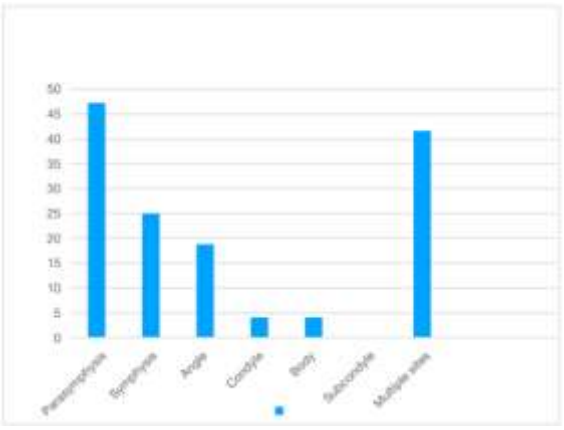

Figure 5

Table 6: Vehicle

Vehicle	Patient	Percentage
Two wheeler	66	47.1
Three wheeler	4	2.9
Four wheeler	47	33.6
Pedestrians	23	16.4
Total	**140**	**100**

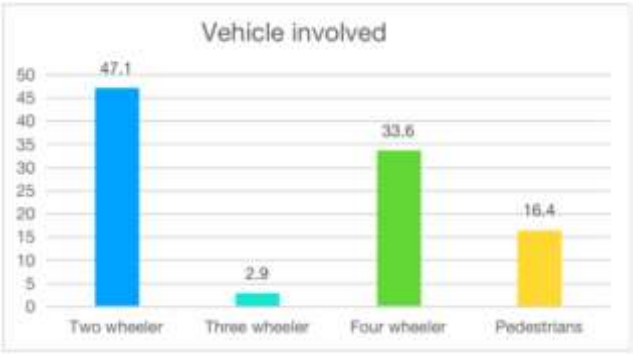

Figure 6

Table 7: Helmet used

Helmet in 2 wheelers	Patient	Percentage
Yes	14	21.2
No	52	78.8
Total	**66**	**100**

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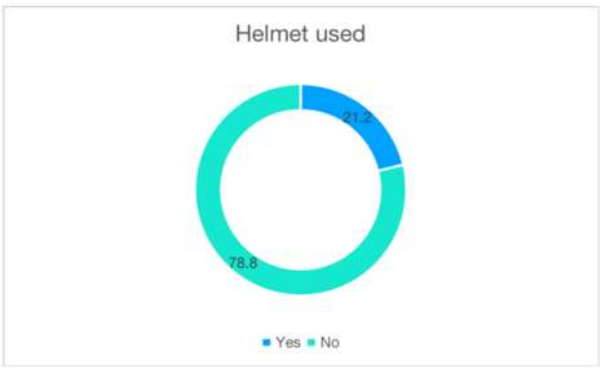

Figure 7

Table 8: Alcohol consumption

Alcohol	Patient	Percentage
Yes	91	65
No	49	35
Total	**140**	**100**

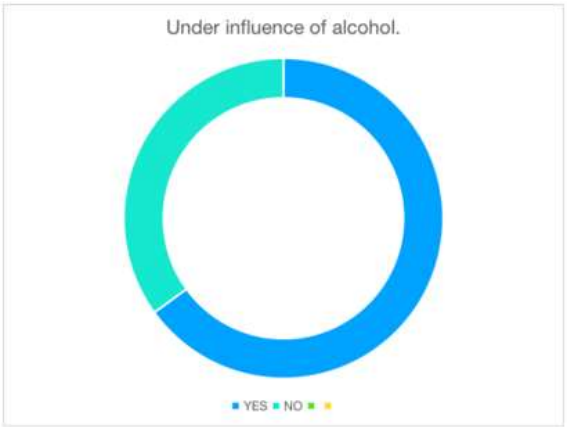

Figure 8

Table 9: Treatment

Treatment	Patient	Percentage
Conservatively	55	39.3
Surgically	85	60.7
Total	**140**	**100**

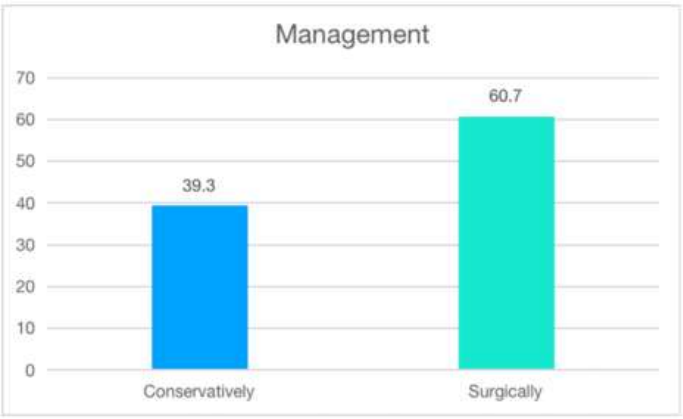

Figure 9

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Table 10: Surgery

Surgery	Patient	Percentage
ORIF	68	80
IMF	17	20
Total	**85**	**100**

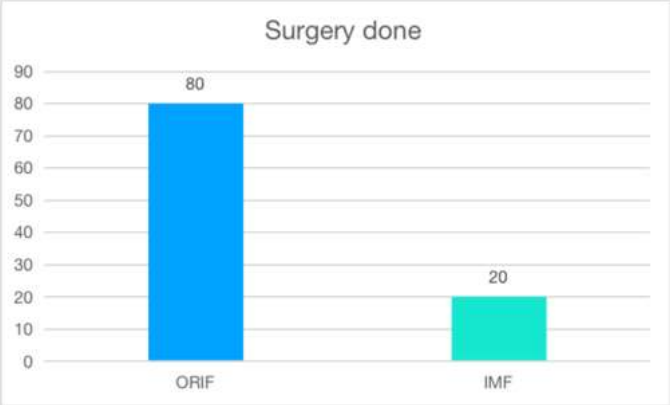

Figure 10

Table 11: Complication

Complication	Patient	Percentage
Yes	11	12.9
No	74	87.05
Total	**85**	**100**

Complication

Complication	Patient	Percentage
Surgical site infection	4	36.36
Occlusion derrangement	3	27.27
Nerve injury	4	36.36
Total	**11**	**100**

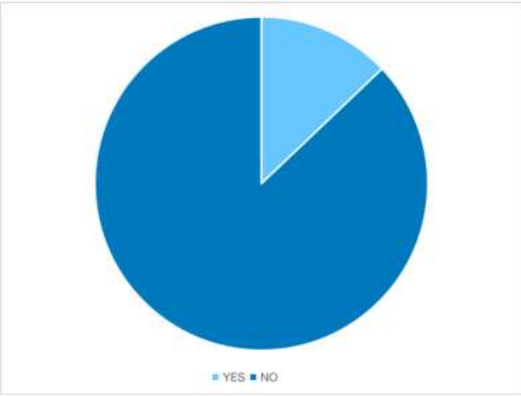

Figure 12

Conclusion

On the basis of data which was reproduced after examination of 140 patients, having RTA with facial bone fractures attending tertiary care hospital, it is concluded that most common fracture following RTA is mandible followed by nasal bone fracture than ZMC fracture

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followed by multiple bone fracture. In mandible, the most common site is parasymphysis followed by multiple sites than symphysis and angle. Two wheeler accidents were majorly seen. Majority of patients were under influence of alcohol. ORIF being the main stay of tment in present study followed by IMF. Majority of them were not wearing helmets.ORIF being the main stay of treatment in present study followed by IMF.To avoid RTA, it is important to implement stringent traffic rules, improving the quality of roads, safety regulation rules should be followed.

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