MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.7.33.36

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Key Words
Mandibular fracture, demographic profile, etiological factors, fracture sites, road traffic accident (RTA)

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Received: 23 April 2024
Accepted: 31 May 2024
Published: 1 June 2024

Citation: Nimeshkumar Patel, Nidhish Shah, Manali Gaudani, Girish Mishra and Yojana Sharma, 2024. Myriad of Mandibular Fracture: Retrospective Study of 3 Years at Rural Base Tertiary Care Hospital Outcomes. Res. J. Med. Sci., 18: 33-36, doi: 10.36478/makrjms.2024.7.33.36

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Myriad of Mandibular Fracture: Retrospective Study of 3 Years at Rural Base Tertiary Care Hospital Outcomes

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Abstract
The mandible is a unique bone and mandibular fractures are the second most common fractures of the facial skeleton. This study was carried out with the aim and objective to characterize the demographic profile, to analyze etiological factors, to identify common fracture sites. The retrospective study was carried out after the permission from the institutional ethics committee. Medical records of eligible patients were reviewed and information collected like patient demographics (Age, gender and relevant medical history)., Mechanism of injury and details of the traumatic event and Fracture type and line of management. All the data were collected for 3 years and data were analysed. Total of 52 patient data were collected and computed in excel data sheet. Out of 52, 46 (88.46%) were male and 6 (11.54%) were female. Type of the fracture shows 19 (32.54%) parasymphysis, 12 (23.08%) symphysis, 6 (11.54%) body, 5(9.62%) condyle, 1 (1.92%) angle and 1 (1.92%) coronoid fracture. Most common mechanism of injury was road traffic accident which was 48 (92.31%) followed by 3 (5.77%) fall down and 1 (1.92%) by assault. Mandibular fracture found most commonly in male with major cause being Road Traffic Accident (RTA) and parasymphysis is the most commonly found mandibular fracture.

INTRODUCTION

Mandible is the largest and strongest facial bone[1]. The mandible is a unique bone having a complex role in aesthetic of the face and functional occlusion. Because of the prominent position of the lower jaw, mandibular fractures are the second most common fractures of the facial skeleton[2].

The etiology and pattern of mandibular fracture vary considerably among different study populations. Mandibular fracture is frequently result of trauma, such as motor vehicle accidents, physical altercations, industrial accidents, falls and contact sports[3]. Also, there is an increase in the proportion of adolescent and young adults sustaining these injuries[1]. Mandibular fractures are uncommon in children under the age of six, likely because of the relative prominence of the forehead compared to the chin. When they do occur, they are often greenstick fractures[3].

Recently, there are well documented data for overall shift in the mechanism of injury and age distribution of patients sustaining these injuries. Increased frequencies of RTA and domestic violence have emerged as the etiological factors in mandibular fractures in developing countries like India. The mechanism of injury correlates significantly with the anatomic location of fracture and knowledge of these associations[1] while study also says that fracture patterns vary according to the etiology of the fracture and direction of the impact force[4]. This information can help in the diagnosis, guide the surgeons for appropriate and timely management and as a guide to future funding of preventive public health programs[1,4]. The incidence and causes of mandibular fracture reflect trauma patterns within the community and can provide a guide to the design of programs geared toward prevention and treatment[5]. However, there is an inadequate understanding pertaining to the specific type or pattern of mandibular fractures particularly those that occur in a rural setup[6].

Despite being the second most common facial fracture[7], there is a noticeable lack of comprehensive, institution-specific data regarding mandible fractures. An understanding of the incidence, patterns and demographics of these fractures is essential for creating informed strategies for patient care and resource allocation.

This study was carried out with aim and Objective to characterize the demographic profile, to analysed etiological factors, to identify common fracture sites, to assess treatment approaches and to evaluate patient outcomes during the study period.

MATERIALS AND METHODS

The retrospective study was carried out at the ENT department of SKH, Karamsad, Gujarat with maxillofacial trauma having the fracture of mandible which were managed surgically during the study period i.e., from October 2020 to September 2023. The study was started only after getting the permission from the institutional ethics committee, HM Patel centre for medical care and education, Karamsad.

All the patients will be selected as per the inclusion and exclusion criteria. Patients of all ages and genders.

- With a confirmed diagnosis of mandible fracture, as documented in their medical records.
- Who has received surgical treatment for their mandible fractures.
- Whose medical records are complete and contain sufficient information for analysis.
- The patients treated at SKH during the specified study period were also included.

Patients with mandible fractures who were:

- Managed non-surgically (e.g., through closed reduction, conservative treatment) without surgical intervention.
- With associated facial fractures but without mandible fractures.
- With a history of previous mandible fracture(s) unrelated to the current trauma.
- With mandible fractures resulting from pathological conditions (e.g., tumours, cysts) were excluded.

Medical records of eligible patients have been reviewed for the following information: Patient demographics: Age, gender and relevant medical history. Mechanism of injury and details of the traumatic event. Fracture type, location and associated injuries (if any). Diagnostic assessments: Radiographs, CT scans, or other imaging studies. Surgical treatment details: Surgical approach, techniques used. Post-operative care and follow-up information.

All the data of last 3 years were collected and analysed. The data collected in a proforma was then tabulated and analysed using IBM SPSS (Statistical Packages for the Social Sciences) Statistics for Windows, Version 22.0 [Armonk, NY: IBM Corp] and the results were expressed in numbers and percentages.

RESULTS AND DISCUSSIONS

According to inclusion and exclusion criteria, total 52 patients could be included in the study over study period of 3 years. Out of 52, 46 (88.46%) were male and 6 (11.54%) were female.

The average time of presentation to the hospital was 6.25 hours with minimum one hour to maximum 23 hours after injury. Most common mechanism of injury was road traffic accident which was 48 (92.31%) followed by 3 (5.77%) fall down and 1 (1.92%) by

Table 1: Presentation of all the patients

Parameters		Numbers	(Percentage)
Time since injury	≤1	01	1.9
	2-6 hours	26	50.0
	7-12 hours	23	44.2
	>12 hours	02	3.8
Consciousness	Conscious	44	84.6
	Unconscious	08	15.4
Orientation to surroundings	Well oriented	41	78.8
	Non-oriented	11	21.2
GCS Score	≤10	06	11.5
	>10	46	88.5
Symptoms and Signs	Pain	49	94.2
	Nasal Bleeding	34	65.4
	Ear Bleeding	04	7.7
	Chewing not possible	43	82.7
	Facial nerve injury	01	1.9
	Head Injury	13	25.0
	ICU admission required	09	17.3
Radiological findings	Displacement	45	86.5
	Floating palate	13	25.0
	Orbital injury	03	5.8
	Right Tripod fracture	10	19.2
	Left Tripod fracture	11	21.2
	Collection surrounding the fracture site	14	26.9
Treatment	Platting	51	98.1
	Wiring	49	94.2

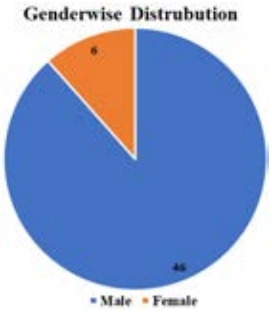

Fig 1: Gender wise distribution of all mandibular fracture patients

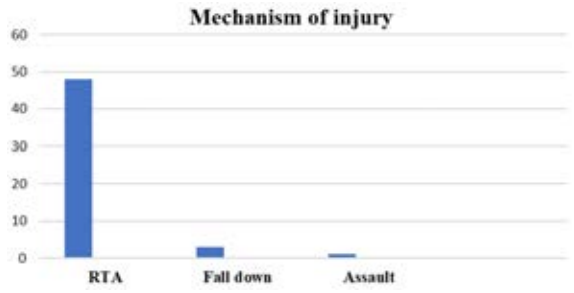

Fig 2: Mechanism of injury

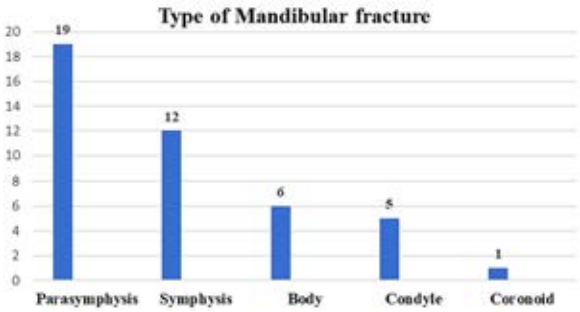

Fig 3: Type of mandibular fracture

assault. 8 (15.38%) patients were unconscious and 11 (21.15%) patients were not well oriented to the surrounding at the time of presentation. At the time of presentation Glasgow Coma Scale (GCS) score was calculated for all the patients. The average score was 13.87 out of 15 maximum with 6 patients had score of = 10.

As seen in (table 1), most of the patient 49 (94.2%) presented with pain at the site of injury. Only one patient found skin loss at the site of injury. 34 (65.4%) patients had nasal bleeding and 4 (7.7%) had ear bleeding at the time of presentation. While no patient had CSF otorrhoea or CSF rhinorrhoea. Chewing was not possible by 43 (82.7 %) patients. One patient found to have facial injury. Head injury was found in 13 (25%) patients. 9 (17.3%) required ICU admission.

All the patients had done facial x-ray and 3D facial CT scan. And radiological finding shows displacement in 45 (86.5%) of the patients and floating palate in 13 (25%) of the patients. However, no any patient found bone loss. 3 (5.8%) had orbital injury. 10 (19.2%) patients had right and 11 (21.2%) patients had left tripod inj Location of the injury shows, 17 (32.70%) were right sided, 13(25%) were left sided, 11 (21.15%) were centrally impacted and 10 (19.23%) were affected on both sides. ury. 14 (26.9%) patients found collection surrounding the fracture site in radiological findings. (table 1).

Type of the fracture shows that 19 (32.54%) parasymphysis, 12 (23.08%) symphysis, 6 (11.54%) body, 5 (9.62%) condyle, 1 (1.92%) angle and 1 (1.92%) coronoid fracture.

All the patients were treated surgically and platting was done in 51 (98.1%) and wiring was done in 49 (94.2%) patients.

Mandibular fracture is second common facial bone fracture after nasal bone fracture. The common etiological factor of mandibular fracture is road traffic

accident while the assault is second common cause. In present study also road traffic accident was the most common etiological factor. Arya Arun *et al.* also showed that predominant etiological factor was road traffic accidents (RTAs) of 79% followed by assaults (10%), accidental falls (10%) and sports injuries (1%)[8]. Alcohol influence was noted in 47% cases with mandibular fracture. Majority of the studies from developing countries like India have found that RTA was the most common etiological factor for mandibular fracture. While in developed countries assaults are the most common cause of mandibular fracture as seen in studies by Thorn JJ *et al.*, which found that the cause of fractures was interpersonal violence while Scherer M *et al*. found that personal assault was found to be the primary cause of mandibular fractures[9,10].

In present study mandibular fracture is more predominance in male than the female which is almost similar to Saravanan *et al.* where 88% were male and 12% female whereas nearly similar to Barde D *et al*. where 79% were male and 21% were female[1]. Vyas *et al*. study also concluded that males are more affected than female[11]. It is mostly because RTA involving two-wheeler vehicle is most common cause and the two-wheeler rider is mostly male. And also accident are more predominant while the rider is drunken, that make more male involvement in mandibular fracture.

Different parts of mandible like symphysis, parasymphysis, body, condyle, coronoid process and angle are getting fractured in whenever mandible is getting involved, of which parasymphysis was the most common. Similar data was found by Barde *et al.* who also found the most common location was parasymphysis region (203, 39.8%) but the next most preferred location was condyle and angle with equal distribution (135 and 124 respectively) at 18% for both[1]. Vyas *et al.* also showed that the most common fracture site is parasymphysis and least common site is ramus of mandible[11]. Sarvanan *et al.* also showed that parasymphysis was most frequently involved site but prevalence was still less than our study i.e., 13.26%[12]. Arya Arun *et al.* showed that parasymphysis site showed highest incidence among anatomical sites (36%) followed by condyle (28%), angle (16%), symphysis (13%), body (12%), ramus (2%) and coronoid (1%)[8]. Displacement of fractured bone was found in majority of the patients, but floating palate was seen in nearly quarter patients.

CONCLUSIONS

Mandibular fracture found most commonly found in male and Road Traffic Accident (RTA) is still being the most common cause. Parasymphysis is the most common site of mandibular fracture.

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