

Mandibular Fractures: An Analysis of the Epidemiology and Patterns of Injury in 4,143 Fractures

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Purpose: The objective of this study was to complete a comprehensive retrospective review of the epidemiology and patterns of injury in mandibular trauma based on the Parkland Memorial Hospital trauma database over a 17-year period. The authors identified 4,143 fractures in 2,828 patients from the databank. In mandibular trauma, the mechanism of injury and several other variables can be an important point of differentiation with regard to fracture pattern. By showing the statistical relation between these and fracture pattern, the authors hope to provide surgeons with a better understanding of such a relation.

Materials and Methods: Mandibular fracture data were collected from the Parkland Memorial Hospital trauma registry using *International Classification of Diseases, Ninth Revision* codes (802.21 to 802.39). Information included fracture type, age, gender, mechanism of injury, and associated injuries. The Parkland Memorial Hospital trauma registry yielded 4,143 mandibular fractures in 2,828 patients managed at Parkland Memorial Hospital from 1993 through 2010.

Results: Based on retrospective analysis, results were obtained for age, gender, monthly distribution, anatomic distribution, and mechanism of injury. The average age was approximately 38 years, with most patients (33%) in the third decade. An overwhelming majority of patients were men (83.27%), with only 16.27% consisting of women. Most injuries occurred in the summer months, with July being the most common month of occurrence. The mechanism of injury predominantly involved low-velocity blunt injuries (62%) compared with high-velocity blunt injuries (31%). The anatomic distribution of fractures evaluated was the angle (27%), symphysis (21.3%), condyle and subcondyle (18.4%), and body (16.8%).

Conclusion: This study helps provide and support the relation between several variables associated with many common traumatic injuries seen in the mandible. This analysis can be used to help surgeons identify and anticipate injuries based on age, gender, and mechanism of injury.

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Maxillofacial trauma remains one of the most common, yet challenging, aspects of oral and maxillofacial surgery. The variety of anatomic involvement, mechanisms, and forms of injury presents challenges to even the most experienced trauma surgeon. Of all the bones in the maxillofacial region, the mandible remains one of the most commonly injured bones in the trauma

setting. The complexity of mandibular injuries is not limited to its different anatomic and functional components, but can be related to numerous other variables that have not yet been fully explored.

Categorizing and then correlating the various mandibular injuries can prove to be challenging. First, it is important to have an appropriate number of

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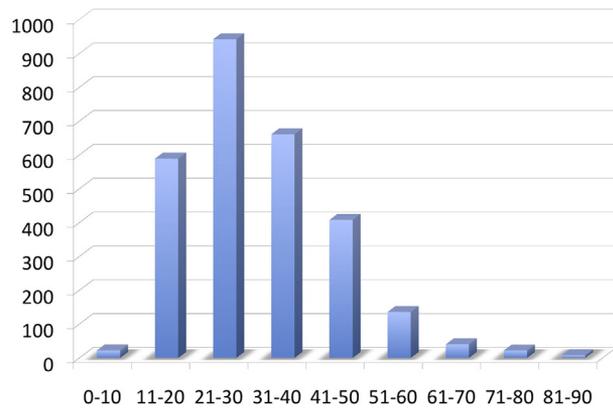


FIGURE 1. Incidence of fracture by age.

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patients with a wide distribution of injuries to the relevant areas of the mandible. Second, the data must be elucidated over an extended period, namely 10 to 15 years at a minimum. These 2 factors—data-gathering factors—might be the most challenging aspect of a study of this magnitude.

Previous studies have focused on variables, such as gender, age, etiology of injury, treatment options, associated injuries in the maxillofacial region, and complications. Although the importance of such information cannot be understated, it is the authors' belief that further analysis can lead to an even greater insight into less salient patterns. In addition, limiting a study to mandibular injuries and associated fracture patterns within specific mandibular anatomic sites can show important correlations.

Ellis et al¹ analyzed more than 3,400 mandibular fractures during a 10-year period from 1974 through 1983. To the authors' knowledge, this is one of the largest retrospective studies performed for assessing mandibular fractures alone. Nevertheless, the study

Table 1. AGE BY DECADE

Decade	n	%
0-10	22	0.78
11-20	589	20.83
21-30	942	33.31
31-40	661	23.37
41-50	408	14.43
51-60	136	4.81
61-70	40	1.41
71-80	22	0.78
81-90	8	0.28
Total	2,828	100.00

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Table 2. FRACTURES BY MONTH

Month	Patients
January	173
February	161
March	212
April	209
May	217
June	223
July	270
August	248
September	223
October	220
November	192
December	197
Total	2,545

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predates many large public safety advances during the past 30 years, such as mandatory use of seatbelts, vehicular airbags, and more routine use of mouthguards or helmets with facemasks in athletic activity, to name but a few. In addition, the study analyzed patients in a different country (Scotland). Although etiologies of injuries remain relatively uniform across the world (assaults, motor vehicle accidents, etc), the distribution of such etiologies can differ from country to country.

More recent retrospective studies have been performed, albeit with a smaller patient sample and in a shorter period. One such study in the United States showed that during a 5-year period, the angle and body not only were the most commonly fractured sites, but also were fractured together most of the time.² Although this study analyzed nearly 380 patients, more than 80% of patients were injured owing to assault. However, another study in India showed that more than 72% of fractures were due to traffic

Table 3. FRACTURE DISTRIBUTION BY LOCATION

Location	n	%
Angle	1,120	27.0
Symphysis	882	21.3
Condyle and subcondyle	761	18.4
Body	696	16.8
Multiple sites unspecified	295	7.1
Ramus	225	5.4
Alveolar border	122	2.9
Coronoid	42	1.0
Total	4,143	100.00

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