A retrospective Study of Mandibular Fracture in Children

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ABSTRACT

Background and Objectives: A retrospective study was done to report the incidence of mandibular fractures in children up to fifteen years of age seen in Rizgaree teaching hospital /Erbil / Kurdistan region of Iraq.

Methods: The patient’s records of 62 injured child aged 0-15 years, from 1/1/ 2002 to 31/12/2008 were retrieved and relevant data was recorded and analysed. A data collection sheet was designed to record patient's name, sex, age, site of fracture, the etiology of the injury and the method of treatment and complications.

Results: The total number of patients who presented with mandibular fracture in children was 62 (78.5%). The ratio of boys to girls was 43 (69.4%) boys and 19 (30.6%) girls (2.2:1). Most of the trauma reported in age group 12-15years (46.8%). Regarding the site of fracture, condylar fracture (46.7%) was most common followed by symphesis (27.4%), dentoalveolar (14.5%), angle (8.1%) and body (3.3%). The main etiology of fracture was fall from height (54.8%). Most of the patients were treated by closed reduction (88.7%) and fixation.

Conclusions: The incidence and etiology of mandibular fracture in children differs among different populations. In our study, the incidence was not very common, fall was most common cause, condylar fracture was most common. Most of the cases can be treated conventionally.

Key words: Mandibular fracture, children, incidence

INTRODUCTION:

Trauma is the leading cause of morbidity and mortality among children, although fractures of the facial skeleton are less common in children than in adults.1-5 Trauma-induced maxillofacial injuries in children may affect function as well as esthetic appearance, and they must be diagnosed promptly and accurately and managed appropriately to avoid disturbances of future growth and development.6 Children have a higher resistance to facial fractures and a greater susceptibility to greenstick fractures than adults do, in part because of the structure of bone in the pediatric facial skeleton. The abundance of cartilage and cancellous bone, low mineralization, and more flexible suture lines and indistinct corticomedullary junction, confer greater elasticity and flexibility on the pediatric facial skeleton.1,3,7 The thick layer of adipose tissue that overlies much of the pediatric facial skeleton, and the fat pads that surround the upper and lower jaws, also help protect these bones.1,3 Prior to the eruption of permanent dentition in children, the body of the mandible is almost entirely filled with teeth. This leaves the remaining bone weakened and unable to resist external forces. Problems peculiar to the treatment of maxillo- mandibular fractures in children are created by the necessity for continuing growth of the child, jaws filled with the teeth, and management difficulties including noncompliance.8

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frequency of facial fractures in children is much lower than that in adults. Approximately 5%–15% of all facial fractures occur in children. The incidence of pediatric facial fractures is lowest in infants and increases progressively with increasing age.\textsuperscript{1-5} The etiology of facial fractures in children is age-dependent and the prevalence differs from adults. The major causes include falls, sporting accidents, MVA (motor vehicle accidents), assaults, and animal kick.\textsuperscript{5,9,10,11} To the author’s knowledge, no previous studies have been done in this regard in Hawler city.

**METHODS:**

In a retrospective study the patient’s records of 62 injured child aged 0-15 years, were retrieved from Department of Oral and Maxillofacial Surgery/ Rizgaree Teaching Hospital, from 1/1/ 2002 to 31/12/2008, and relevant data was recorded and analysed. Most of the patients were referred from Health Care Centers and all Hospitals of Hawler Governorate, as the only Department of Oral and Maxillofacial Surgery is in Rizgaree Teaching Hospital. A data collection sheet was designed to record patient’s name, sex, age, site of fracture, the etiology of the injury and the method of treatment and complications. The patients were divided into four age groups (0-3, 4-7, 8-11, and 12-15), as the etiology of trauma varies with age-related activities and exposures, and the significant variations in the ratio between cranial volume and facial volume at different ages.

**RESULTS:**

Among a total number of 415 patients with maxillofacial fracture, only 78 (18.8%) patients were children. Mandibular fracture in children accounted for 14.9% of the total number of patients (415). Among these 78 children, 62 (79.5%) cases had mandibular fracture. The ratio of boys to girls was 43:19 (2.2:1) as shown in (Figure 1). Most of the trauma as shown in (Figure 2) was reported in age group 12-15 years (46.8%).

**Figure (1):** Gender distribution of fracture mandible in children.

**Figure (2):** Age distribution of children with mandibular fracture.

Figure (3) shows the site of fracture. Condylar fracture seen in 29 (46.7%) of the cases and was most common followed by symphysis 17 (27.4%), dentoalveolar 9 (14.5%), angle 5 (8.1%) and body 2 (3.3%). The main etiology of fracture was fall from height (54.8%), as shown in Figure 4. Patients with green stick fracture of the condyle, 29 (46.7%), were treated by observation and follow up. In patients with symphysis fracture 17 (27.4), those with non displaced fracture 7 (11.28%) were treated by observation and follow up. Open reduction with intraosseous wiring placed in the inferior border of the symphysis supported by simple interdental wiring (without inter-maxillary fixation) were used for the remaining cases 10 (16.12%) of symphysis fracture.
One patient that had non displaced body fracture was managed by observation and follow up (soft diet). Whereas the case with displaced body fracture was treated by closed reduction using eye let and inter-maxillary fixation for 2 weeks duration. Mandibular angle fractures (5 cases) were treated by open reduction, intraosseous wiring, and inter-maxillary fixation using eye let for two weeks duration, Table (1). Regarding complications, no fibrous healing was seen, in 2 cases with mandibular symphysis fracture tooth bud of permanent canine was destroyed during bone preparation for wire placement, in 1 case permanent lateral incisor displaced during fracture site manipulation. No malocclusion reported in all cases.

![Figure (3): Distribution of mandibular fracture site in children](image)

![Figure (4): Etiology of mandibular fracture in children.](image)
DISCUSSION:

The Department of Oral and Maxillofacial Surgery at Rizgareh teaching Hospital is the main unit treating adult and pediatric facial fractures in Hawler governorate. The pediatric facial trauma patient provides several different considerations that are not present in the adult. First, the pediatric patient has the tremendous advantage of an accelerated ability to heal in a very short time with few complications, aided by the well vascularized tissues of the face. Second, through the assistance of growth and an inherent ability to adapt, recovery of damaged orofacial tissues and function is much better than in the adult.12 Our results showed that boys are more prone to injury than girls and this has been seen in many studies1-23. A possible explanation for this could be that girls mature earlier than boys,11 they are less involved in outdoor activities16 and contact sports17. We found that the incidence of mandibular fracture in children increases with the increased age of the children. Thirteen to fifteen years age group accounted for most of the presentations, which correlates closely with other studies.11,14 This could be due to the significant variations in the ratio between cranial volume and facial volume at different ages, and these variations may influence fracture patterns. The frontal cranium is prominent in the very young; whereas the mandible becomes more prominent with increasing age.14 It may also be due to the fact that as children get older, they are increasingly active with less adult supervision. This results in a greater likelihood of sustaining trauma18. While accidental falls were found to be the most common cause of mandibular fractures in our study and many other published studies,1,10,11,13,15 others reported road traffic accidents as the main cause.6, 19,20,21 Published data from different studies on the etiology tend to vary from one country to another, perhaps because of the differences in social, cultural and environmental factors1. Among the sites of fracture, condylar fracture was the most common and the least common was

<table>
<thead>
<tr>
<th>Location of fracture</th>
<th>No.</th>
<th>Closed reduction with dental fixation</th>
<th>Intraoral open reduction with internal fixation</th>
<th>Extraoral open reduction with internal fixation</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condyle</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>Symphysis</td>
<td>17</td>
<td></td>
<td>10</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Dentoalveolar</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Angle</td>
<td>5</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>Body</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
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Similar results have been reported in all previous studies. A possible explanation for the high percentage of condylar fracture is that during infancy and early childhood, compression fractures of the mandibular condyle are commonly associated with the presence of a short, thick condylar neck as well as a high ratio of cancellous to cortical bone. As a child grows and the neck of the condyle elongates, so does the risk of condylar neck fracture rather than condylar head fracture. Regarding treatments, non-displaced fractures were treated by observation and follow up. Displaced symphysis, body and angle fractures were treated by open reduction and intermaxillary fixation for two weeks because of rapidity of healing in children. This view has been supported by many authors. Management of mandibular fracture in children differs from that of adults because of anatomic variation, rapidity of healing, degree of cooperation and the potential for interference with the mandibular growth. In addition, children in the deciduous and mixed dentition stages demonstrate some capacity for spontaneous occlusal readjustment, after injury and treatment, as deciduous teeth are shed and permanent teeth erupt. This study reported a higher incidence of condylar fracture in our children than some previous studies and lower incidence than some other reported studies. Published data from different studies on the incidence of mandibular fractures tend to vary from one country to another, perhaps because of the differences in social, cultural, and environmental factors. There may be some sort of bias since some of the patients were treated in private hospitals. This study aimed to provide preliminary data base about the incidence of mandibular fracture in children and form a base for future studies.

The incidence and etiology of mandibular fracture in children differs among different not very common, falls are most common cause, condylar fracture is most common. Most of the cases can be treated conventionally.

**REFERENCES:**


