FRACHTURES OF THE FACIAL SKELETON AT KOTA BHARU KELANTAN: A RETROSPECTIVE STUDY

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ABSTRACT

A retrospective study of 334 patients with fractures of the facial skeleton was undertaken. The incidence, race, sex, seasonal variations, age groups and causes were reviewed. The most common fracture encountered was mandibular (40.39%) followed by fractures of the zygomatic bone (27.09%). The majority of the patients were Malays. The male:female ratio was 5.4:1. The age group 20-29 was the most commonly affected. Only 12 occurred in children under 10 and 21 in the elderly above 60. The incidence showed a seasonal variation with peaks occurring in April and May during the fasting and festive seasons and October at the start of the monsoon season. By far the commonest cause was road traffic accidents (81.13%).

INTRODUCTION

Previous studies1,2,3 on facial fractures have been conducted in the towns of the West coast of peninsula Malaysia and no data is currently available for facial fractures occurring in the mainly rural east coast population.

The northeast part of the peninsula is populated by a predominantly Malay and muslim population and the climate shows a distinct wet and dry season. These factors may have an effect on the incidence and etiology of facial fractures.

MATERIALS AND METHODS

The information obtained was based on the analysis of non-fatal maxillofacial injuries from two main Kota Bharu hospitals; the General Hospital Kota Bharu and Hospital Universiti Sains Malaysia. These two hospitals act as referral centres for maxillofacial trauma cases in Kelantan and northern Terengganu. Fractures were classified according to the simplified classification of Killey4 for maxillary fractures and a modification of Killey's classification for mandibular fractures5. Fractures of the frontal bone and naso-ethmoidal fractures were excluded from this study.

RESULTS

In the five years of the study, 334 patients were found to have 406 fractures. Of these, the patients were predominantly Malay. The Chinese were the next most commonly affected followed by Indians (Table 1). Males constitute 84.43% of all patients with a sex ratio of 5.4:1 (Fig. 1). The extremes of age ranged from 5 to 79. Of the 334 cases only 4% were children under the age of 10 years and 6.29% were more than 60 years old (Fig. 2).

Table 1: Distribution of patients with fractures of the facial skeleton by race.

<table>
<thead>
<tr>
<th>Race</th>
<th>Nos. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malays</td>
<td>306</td>
<td>91.62</td>
</tr>
<tr>
<td>Chinese</td>
<td>24</td>
<td>7.18</td>
</tr>
<tr>
<td>Indians</td>
<td>3</td>
<td>0.90</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.30</td>
</tr>
<tr>
<td>Total</td>
<td>334</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The types of fractures encountered are documented in Table 2. The commonest fracture was mandibular (40.39%) followed by zygomatic fractures (27.05%) and dentoalveolar fractures (12.56%).

In the mandible the commonest site was the anterior body (31.38%) followed by the posterior body (24.14%) and condylar fractures (21.72%) Table 3. The mandibular angle was not a common site. Le Fort II fractures were the most common maxillary fractures. Le Fort III fractures were the
Facial Skeletal Fractures
According to sex

Distribution of fractures
according to age

Table 2: Pattern of fractures.

<table>
<thead>
<tr>
<th>Types of fractures</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dento alveolar</td>
<td>51</td>
<td>12.56</td>
</tr>
<tr>
<td>Mandibular</td>
<td>164</td>
<td>40.39</td>
</tr>
<tr>
<td>Le Fort I</td>
<td>14</td>
<td>3.45</td>
</tr>
<tr>
<td>Le Fort II</td>
<td>44</td>
<td>10.84</td>
</tr>
<tr>
<td>Le Fort III</td>
<td>17</td>
<td>4.19</td>
</tr>
<tr>
<td>Orbital</td>
<td>6</td>
<td>1.48</td>
</tr>
<tr>
<td>Zygomatic Complex</td>
<td>110</td>
<td>27.09</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>406</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

next most common followed by than Le Fort I fractures (Table 4).

Figure 3 shows the main causes. 81.13% of the fractures were sustained as a result of road traffic accidents. The next most common cause was falls (8.08%) followed by assaults (6.00%). Sports injuries accounted for most of the rest.

The rate of fractures is seasonal. In the months of April and May more fractures were recorded than in the rest of the year. There is also a smaller peak in October (Fig. 5).

DISCUSSION

Comparing our results with similar studies carried out previously\(^1\),\(^2\) showed that in contrast to the studies by Ramanathan and Ishak et al. Malays were the most common racial group presenting with facial fractures. This is expected since Malays comprise more than 90% of the population in northeastern peninsula Malaysia. The Chinese were the next most commonly affected followed by Indians. Again this reflects the racial composition of this region. In contrast to the findings by Ishak in none of the three cases involving Indians was alcohol related assault the cause.

Males predominate. This is similar to that reported in most earlier studies\(^2\),\(^3\),\(^10\). The ratio of males to females was 5.4 : 1. This male predominance is greater than that reported by Ishak\(^2\), but is similar to that reported by Khalil and Shaladi.\(^10\)

The rate of fractures is nearly constant from year to year but with a trend towards an increase (Fig. 6). There was a marked increase in the number of fractures in the fasting and festive seasons in the months of April and May. A probable explanation is that fasting can affect a driver’s concentration whereas during the festive time there is an increase in vehicular traffic.

A smaller peak was noted in the month of October at the start of the monsoon season when roads become wet and slippery due to light rainfall.

Flooding prevents travel by road in some areas and slows down traffic. The heavier rainfall
Aetiology of facial fractures
Kota Bharu 1987-1991

Seasonal variation
facial fractures 1987-1991

Figure 5. Seasonal Variation – facial fractures
1987 – 1991

Figure 6. Rate of facial bone fractures
Kota Bharu 1987 – 1991

PERCENT DUE TO
MOTOR VEHICLE ACCIDENTS

Rate of facial bone fractures
Kota Bharu 1987-1991
Table 3: Anatomic location of mandibular fractures.

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Condyle</th>
<th>Coronoid</th>
<th>Angle</th>
<th>Anterior Body</th>
<th>Dento alveolar</th>
<th>Ramus</th>
<th>Posterior Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTA</td>
<td>50</td>
<td>4</td>
<td>19</td>
<td>76</td>
<td>24</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td>Assault</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Falls</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Sport</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Misc</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>63</td>
<td>5</td>
<td>29</td>
<td>91</td>
<td>31</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>Percentage</td>
<td>21.7</td>
<td>1.7</td>
<td>10.0</td>
<td>31.4</td>
<td>10.7</td>
<td>0.3</td>
<td>24.1</td>
</tr>
</tbody>
</table>

discourages traffic. These factors would reduce the accident rate.

Of the 334 patients in the series, the majority were in the 10-39 age group with the peak incidence occurring in the 20-29 age group. The same age group predominated in previous studies6-7. However 45 (13.48%) were in the above 50 age group. This is a higher figure than that found by Nor3 (2.5%) and Ishak2 (5.3%). However the percentage of victims in the 20-29 age group in our study is much less than in both their analyses. A large number of youths in Kelantan are migrant workers in the more industrialised and wealthy west coast states and this may account for this finding.

The majority of cases were due to road traffic accidents. Ramanathan1 in a similar study carried out in Johor in 1975 found 54.9% of cases were due to road traffic accidents. Ishak2 in a more recent analysis found 73.4% of cases were due to road traffic accidents. Our figure of 81.13% is even higher (Figure 3, 4). Rapidly developing Malaysia has seen marked increase in vehicular sales in recent years. The increase in the number of vehicles on the roads has led to an increase in the incidence of road traffic accidents and facial fractures due to road accidents. Furthermore the compulsory wearing of seat belts and crash helmets has led to an increase in the number of patients surviving the accidents and presenting for treatment. Road traffic accidents has become by far the most important cause of facial fractures. The mandible was the commonest facial bone fractured accounting for 40.39 per cent of fractures. In the mandible the commonest site was the symphyseal and parasymphyseal regions followed by condylar fractures and posterior body fractures. The location of the fractures appears to be related to etiology. In road traffic accidents cases, the symphyseal and parasymphyseal regions were the commonest site whereas when the fractures were caused by falls the condylar regions were more likely to be affected. Patients who were assaulted presented mostly with body or angle fractures. These findings generally agree with those of Adi et al.8

We found Le Fort II fractures to be the most common maxillary fracture. This is in agreement with previous studies by Nor3 and that by Sawhney and Ahuja6 but Ishak2 reported Le Fort I fractures were more common than Le Fort II fractures.

REFERENCES