Study of Occurrence of Fracture Shaft of Humerus In Adults

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Aims and Objectives: This study was conducted to know the commonest causes for occurrence of fracture shaft of humerus in adults and outcome of flexible intramedullary nailing of humeral shaft fractures.

Methodology: The study was conducted in Chigateri Government hospital and Bapuji Hospital attached to J.J.M. Medical college, Davangere between October 2010 to September 2012. Results and conclusion: In 20 patients Majority of the patients 14(70%) were females and 6(30%) were males. RTA was the most common cause of injury being responsible for 80.00% of cases, 15 fractures were closed and 5 were open fractures. Most of the fractures were located in the middle third of the shaft (60%). The follow up ranged from 6 months to 18 months. 14(70%) patients had sound union in less than 18 weeks, 2(10%) patient had delayed union (22 Wks), 4 (20%) patient had non-union, 1 patient had implant breakage. 19(95%) patients recovered full range of motion of shoulder and elbow joint while 1 (5%) patient recovered good range of motion (within 10-15% of full range). The average ASES score obtained was 50. 14(70%) patients had excellent results, 2(10%) patients had good results and 4 (20%) patient had poor result.

OBJECTIVES:
1. To study the functional outcome following the use of flexible nails for humeral shaft fractures in adults.
2. To study the duration of union in the above mentioned fractures.
3. To study the complications of flexible intramedullary nailing of humeral shaft fractures

METHODOLOGY:
In this study 20 patients with humeral shaft fractures were studied. All the cases were treated in Chigateri Government hospital, Bapuji Hospital attached to J.J.M. Medical college, Davangere between October 2010 to September 2012.

All cases were treated using close reduction and internal fixation using flexible nailing retrograde technique.

OBSERVATIONS AND RESULTS:
Age and sex distribution:
Age of these patients ranged from 18 to 70 years with 7 (35%) patients in 4 decade. The average age was 40 years. Majority of the patients, 14(70%) were females and 6(30%) were males. Details are shown in figure 1.

Mode of injury
We found that road traffic accident was the most common cause of injury being responsible for 80.00% of cases followed by domestic accidents (10.00%), Fall from height (5.00%) and assault (5.00%). Details are shown in figure 2.

Side affected:
Left extremity was more often involved 60%. Right extremity was involved in only 40% of cases.

Fracture characteristics:
Most of the fractures were located in the middle third of the shaft (60%).

15 fractures were closed and 5 were open fractures. Majority of fractures (70%) were transverse type. In (30%) fractures were oblique type. Details are shown in figure 3.
Time of union:

The time of union of fracture is shown in figure 4. Nearly 60% of the fractures united between 14–18 weeks.

Table 1: Comparison of demographic profile with previous studies

<table>
<thead>
<tr>
<th>SERIES</th>
<th>AVG AGE</th>
<th>M:F RATIO</th>
<th>TYPE OF FRACTURE</th>
<th>Good Range of motion</th>
<th>Commonest site</th>
</tr>
</thead>
<tbody>
<tr>
<td>James et al [2]</td>
<td>49.7</td>
<td>6:4</td>
<td>Transverse &amp; oblique</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wilairatana V, Prasongchin P [3]</td>
<td>29</td>
<td>16:5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gongol T, Mracek D [4]</td>
<td>47</td>
<td>-</td>
<td>-</td>
<td>31</td>
<td>-</td>
</tr>
<tr>
<td>Strong GT, Wallis N [5]</td>
<td>-</td>
<td>11:138</td>
<td>Transverse</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>McQueen MM [6]</td>
<td>44:38</td>
<td>&amp; short oblique</td>
<td>Middle third</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tingstad EM et al [8]</td>
<td>-</td>
<td>Transverse and short oblique</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Present study</td>
<td>38</td>
<td>6:14</td>
<td>Transverse</td>
<td>16</td>
<td>Middle third</td>
</tr>
</tbody>
</table>

Table 2: Fracture union rate obtained in various studies

<table>
<thead>
<tr>
<th>Series</th>
<th>Total no of patients</th>
<th>Delayed union</th>
<th>Nonunion</th>
<th>Overall results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kleinerman L [9] (1966)</td>
<td>98</td>
<td>9(8.2%)</td>
<td>-</td>
<td>98(100%)</td>
</tr>
<tr>
<td>Bell MJ et al [10] (1985)</td>
<td>34</td>
<td>-</td>
<td>1(3%)</td>
<td>33(97%)</td>
</tr>
<tr>
<td>Gongol T, Mracek D [4] (2002)</td>
<td>32</td>
<td>-</td>
<td>1(3.1%)</td>
<td>31(96.9%)</td>
</tr>
<tr>
<td>Present study (2012)</td>
<td>20</td>
<td>2(10%)</td>
<td>4(20%)</td>
<td>16(80%)</td>
</tr>
</tbody>
</table>
Comparing our study with that of previous reported series, the demographic profile, fracture union rates and overall results is shown in table 1, 2 and 3 respectively. In this study, twenty cases with twenty fractures of shaft of humerus in adults were surgically managed by closed reduction and internal fixation using flexible nails between October 2010 to September 2012 at Bapuji Hospital and Chigateri General Hospital attached to J. J.M. Medical College, Davangere.

All patients were evaluated clinically and radiologically before and following surgery, for an average period of follow up was 7 months. The age of the patient in this study, ranged from 20 years to 60 years average being 38 years. There were 6 male patients as compared to 14 female patients in this study. A total of 12 patients had fracture of left humerus shaft and 8 patients had fracture of right humerus. All fractures were closed. A total of 16 cases sustained fracture following road traffic accident, 2 cases had domestic trauma, 1 sustained fall from height and 1 case of assault. In this study, 12 fractures were situated in middle third of shaft, 4 fractures in the upper 3rd, and 4 fractures in the lower third of shaft of humerus. Different fracture patterns were seen, 14 were transverse, 6 oblique. There were 4 cases of associated chest injury, 1 head injury, 2 cases of hand injury, one case both bone leg fracture. The fractures united in 14(70%) patients, 2(10%) cases of delayed union and 4(21%) cases of non-union.

The fracture was additionally supported by humerus brace postoperatively for 10 days. Post operatively patients were rehabilitated with active exercises of all the joints of the involved upper limb as soon as possible. Good or full range of mobility of shoulder and elbow joints was present in all patients.

By the analysis of the data collected in the present study, closed reduction and internal fixation with flexible nailing for humeral shaft fracture is one of the modality of treatment for fracture shaft of humerus in adults.

**REFERENCES**