Operative Fixation for Distal Radius Fractures: Radiological Outcomes & the Role of Upper Limb Trauma Lists

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Overview
- This study evaluated the radiological outcomes of distal radius fractures following operative management, in particular, the role of upper limb specialists in management of such fractures.
- We found that radiological outcomes have improved following implementation of dedicated upper-limb trauma lists.
- More complex wrist fractures may benefit from operative intervention by specialist upper-limb surgeons.

Introduction
- The most commonly treated fracture is that of the distal radius.1
- A 2011 article by Ng and McQueen identified radiological parameters that were potential predictors of functional outcome in patients undergoing operative intervention for distal radius fractures.2 (Table 1)
- A previous review in our trust demonstrated that only 63% had satisfactory radiological parameters.
- Additional upper-limb trauma theatre sessions have since been implemented for management of more complex cases.

Aim
- To evaluate the radiological outcomes following operative fixation of distal radius fractures.
- To assess the influence of specialist upper limb trauma lists on outcomes of distal radius fixation.

Method
- A retrospective review of patients treated with operative fixation (either K wire or open reduction and internal fixation) of the distal radius.
- Four month period assessed (February-May 2013)
- Post-operative radiographs were assessed against unsatisfactory parameters set out by Ng and McQueen (Table 1, Figure 1).
- Radiological outcomes were compared to those in previous study.

<table>
<thead>
<tr>
<th>Radiological View</th>
<th>Recommended Limits</th>
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<tbody>
<tr>
<td>Posteroanterior view:</td>
<td></td>
</tr>
<tr>
<td>Positive ulnar variance</td>
<td>2mm</td>
</tr>
<tr>
<td>Gap or step in joint</td>
<td>2mm</td>
</tr>
<tr>
<td>Lateral view:</td>
<td></td>
</tr>
<tr>
<td>Carpal malalignment</td>
<td>Present</td>
</tr>
<tr>
<td>Dorsal palmar tilt</td>
<td>Neutral</td>
</tr>
<tr>
<td>Gap or step in joint</td>
<td>2mm</td>
</tr>
</tbody>
</table>

Table 1: Target post-operative radiological parameters set out by Ng & McQueen.

Results
- 50 consecutive patients underwent fixation of the distal radius over the 4 month period.
- 74% of patients had satisfactory radiological outcomes in all parameters.
- 22% of patients were operated on by upper-limb surgeons: 82% of this group had satisfactory outcomes, compared with 64% operated on by non-upper limb specialists.
- Type of fixation and unsatisfactory parameters are outlined in Figure 2 & Table 2 (below).

![Figure 1a- the measurement of radial height with a neutral ulnar variance; 1b- the measurement of palmar tilt; 1c- the assessment of radiocarpal malalignment, taken from 2](image)

Table 2: Type of operative fixation and outcomes

<table>
<thead>
<tr>
<th>Type of fixation</th>
<th>Satisfactory parameters</th>
<th>Unsatisfactory parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIF</td>
<td>84% (n=27)</td>
<td>16% (n=5)</td>
</tr>
<tr>
<td>K wire</td>
<td>53% (n=9)</td>
<td>47% (n=8)</td>
</tr>
<tr>
<td>ORIF &amp; external fixator</td>
<td>100% (n=1)</td>
<td>0%</td>
</tr>
</tbody>
</table>

Figure 2: Breakdown of unsatisfactory radiological parameters
- Of the 13 patients with an unsatisfactory radiograph, 92% (n=12) had one unsatisfactory parameter. One patient (8%) had 3 unsatisfactory parameters.

Conclusion
- Radiological outcomes have improved following implementation of upper-limb trauma lists.
- However, 26% still had unsatisfactory parameters.
- It is important that principles of operative fixation are strictly adhered to, with non-specialists having adequate case volume to maintain their skills in wrist trauma.
- More complex cases may benefit from intervention by upper-limb surgeons.

References: