Base of long finger metacarpal fractures
A long term follow up study

Kamphuis SJM1, Kecker LS1, Stämpfli BV1, Sproedt J1, Jandali AR1, Schaefer DJ2
1 Department of Surgery, Clinic of Hand- and Plastic Surgery, Cantonal Hospital Winterthur, Switzerland
2 Department of Plastic, Reconstructive, Aesthetic and Hand Surgery, University Hospital Basel, Switzerland

Goals
- Intra-articular long finger base of metacarpal fracture(s) (-dislocations) are a relatively rare injury, which is mostly seen in young males
- Long term follow up concerning function and residual (pain) complaints

Methods
- Retrospective follow up investigation with a minimal follow up of 2 years
  - subjective outcome anamnesis
  - QuickDASH
  - range of motion
  - grip- and pinch strength

Patient characteristics
- 24 patients with 31 metacarpal fractures
  - 20 males and 4 females
  - Mean age at trauma 35.3 ± 16.2 years
  - 19 injured their dominant hand, 5 combination injuries of at least two injured metacarpals
  - Fractured metacarpal
    - 23x 5th, 5x 4th, 2x 3rd, 1x 2nd metacarpal
  - Mechanism of trauma
    - Fall 9 patients, bicycle 5 patients, MVA 4 patients, wedging 4 patients, violence 2 patients

Treatment
- Closed reduction and percutaneous Kirschner wire fixation
- Postoperative immobilisation
  - Cock up brace 8 patients
  - Intrinsic plus splint 6 patients
  - Metacarpal brace 5 patients
  - Velcro brace 5 patients

Postoperative course
- Inability to work 73.8 ± 32.0 days (10.5 weeks), in a population of 79.2% physical labourers
- Complications
  - 2x Superficial wound infection
  - 1x CRPS I
  - 1x Inactivity dystrophy
  - 1x Kirschner wire dislocation

Long term follow up
- Mean follow up 5.7 ± 2.3 years
- Sensibility
  - 3 reduced or tingling sensation
- VAS
  - General 0.0 (0.0 – 0.0)
  - Maximal 0.0 (0.0 – 4.8)
- Regained strength 10.0 (9.3 – 10.0)
- DASH
  - General (n=24) 0.0 (0.0 – 2.3)
  - Work (n=22) 0.0 (0.0 – 0.0)
  - Hobby (n=18) 0.0 (0.0 – 0.0)

Range of motion (degrees)

<table>
<thead>
<tr>
<th>Range of motion</th>
<th>Affected</th>
<th>Non-Affected</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>70.6</td>
<td>72.2</td>
<td>NS</td>
</tr>
<tr>
<td>Extension</td>
<td>61.2</td>
<td>63.5</td>
<td>NS</td>
</tr>
<tr>
<td>Ulnar deviation</td>
<td>52.8</td>
<td>54.6</td>
<td>NS</td>
</tr>
<tr>
<td>Radial deviation</td>
<td>57.2</td>
<td>56.9</td>
<td>NS</td>
</tr>
<tr>
<td>MCP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>84.9</td>
<td>87.7</td>
<td>NS</td>
</tr>
<tr>
<td>Extension</td>
<td>-13.8</td>
<td>-16.8</td>
<td>NS</td>
</tr>
<tr>
<td>PIP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>91.8</td>
<td>90.9</td>
<td>NS</td>
</tr>
<tr>
<td>Extension</td>
<td>-3.9</td>
<td>-4.9</td>
<td>NS</td>
</tr>
<tr>
<td>DIP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>73.2</td>
<td>74.9</td>
<td>NS</td>
</tr>
<tr>
<td>Extension</td>
<td>0.4</td>
<td>0.8</td>
<td>NS</td>
</tr>
</tbody>
</table>

Strength (kg)

<table>
<thead>
<tr>
<th>Strength (kg)</th>
<th>Affected</th>
<th>Non-Affected</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip strength</td>
<td>36.0</td>
<td>39.7</td>
<td>NS</td>
</tr>
<tr>
<td>Pinch strength</td>
<td>8.1</td>
<td>8.5</td>
<td>NS</td>
</tr>
</tbody>
</table>

Significantly better grip strength when the dominant extremity was injured (42.4 vs. 30.9 kg, \( p=0.029 \))

Limitations
- Small population
- Loss of follow up
- No fixed treatment protocol
- Bias

Conclusions
- Better strength after injury of the dominant hand, probably because of more intensive and continuous use
- Although of a descriptive nature, our study is relevant because of the high impact the functional results may have on the ability to work and the quality of life of young male patients and supports the chosen operative method
- Closed reduction and percutaneous Kirschner wire fixation is a valid method to treat base of longfinger metacarpal fracture (-dislocations)

References