Cast immobilization with the wrist of extension for the treatment of distal radius fractures in elderly patients

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BACKGROUND
For conservative treatment of distal radius fractures
・Closed reduction and cast immobilization is standard technique
・Wrist position during immobilization is controversial
・Gupta reported cast immobilization with the wrist “dorsiflexed” in 1991

We investigated the effectiveness and limitation of the wrist extension cast technique
・Get injured November 2015 ~ March 2017
・Age ≥ 60
・Distal radius fractures
・Follow up period ≥ 8 weeks

50 cases
Conservative treatment 43 cases
Closed reduction 34 cases

The wrist extension cast 30 cases

MATERIALS
・Age
72.8 (61 ~ 95)
・Gender
M 2, F 28
・AO classification (cases)
A2 6, A3 10
C1 2, C2 11, C3 1

Closed reduction after closed reduction
Press the dorsal side of the wrist (distal radius and proximal carpal raw) toward the volar side
Keep the wrist in extension
A/E cast 4, B/E cast 26
Period of cast immobilization
5.2 (4 ~ 10) weeks

RESULTS

Radiographic parameter | At injured (surgery cases) | After reduction (surgery cases) | Final follow up
--- | --- | --- | ---
Volar tilt (°) | -13.3 (-26.2) | +4.6 (+1.6) | +0.5
Ulnar variance (mm) | +1.9 (+2.5) | +1.4 (+0.8) | +2.9
Radial inclination (°) | 20.1 (18.4) | 22.2 (23.0) | 21.6

・Volar tilt: collection loss 4.1°, final + 0.5° → acceptable
・Ulnar variance: collection loss 1.4 mm, final 2.9 mm → acceptable or not
・Comparison to past conventional cast reports: Better radiographic results
・Failure cases (surgical cases or VT < -10 or UV > 3.0 at last) had larger UV at initial or after reduction.

METHODS
・Cast immobilization after closed reduction
・Press the dorsal side of the wrist (distal radius and proximal carpal raw) toward the volar side
・Keep the wrist in extension
・A/E cast 4, B/E cast 26
・Period of cast immobilization 5.2 (4 ~ 10) weeks

・Age: 72.8 (61 ~ 95)
・Gender: M 2, F 28
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DISCUSSION
・Volar tilt: collection loss 4.1°, final + 0.5° → acceptable
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・Comparison to past conventional cast reports: Better radiographic results
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<table>
<thead>
<tr>
<th>Results</th>
<th>Conventional cast (Systematic review)</th>
<th>Diaz-Garcia et al. 2011</th>
<th>Extension cast Kogure et al. 2013</th>
<th>Our study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>69</td>
<td>68</td>
<td>73.2</td>
<td></td>
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<tr>
<td>Follow up period (w)</td>
<td>36</td>
<td>22</td>
<td>22</td>
<td></td>
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<tr>
<td>Volar tilt (°)</td>
<td>-11</td>
<td>3.1</td>
<td>0.5</td>
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<tr>
<td>ΔVT (after reduction → final follow up)</td>
<td>-2.9</td>
<td>-4.1</td>
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<tr>
<td>Radial inclination (°)</td>
<td>14.8</td>
<td>22.1</td>
<td>21.6</td>
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<tr>
<td>ΔRI (after reduction → final follow up)</td>
<td>-1.8</td>
<td>-1.5</td>
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<td>Ulnar variance (mm)</td>
<td>3.6</td>
<td>3.6</td>
<td>2.9</td>
<td></td>
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<tr>
<td>ΔUV (after reduction → final follow up)</td>
<td>2.0</td>
<td>1.4</td>
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</tbody>
</table>

P values:
- UV(initial): p < 0.05
- VT(initial): p = 0.47

CONCLUSION
・Wrist extension cast technique provides minimum collection loss of VT but can not maintain UV
・We recommend wrist extension cast technique as the first choice of displaced distal radius fractures in elderly patients