Ectopic ossification of the elbow after comminuted fractures of the distal humerus

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Purpose
To determine the incidence of ectopic ossification (EO) after double-plating fixation of comminuted fractures of the distal humerus and to characterize the extent of EO and the consequential functional impairment.

Materials (2005〜2016)
15 patients (12 male, 3 female) Age: 41 years (21–60) ISS: 23 (9-59)
Mechanism of injury: fall, traffic accident, machinery injury, sport activity
AO classification: A3:2, C2:7, C3: 5 Open fx.:11
Definitive internal fixation: p.o. 16 days (4–36) Bone grafting: 8 Ulnar nerve transposition: 15
F/U: 3 years and 7 months (7 months–9 years)

Results
Bony union: all patients
ROM: - 19°/119° (ext/flex) MEPS: excellent in 7, good in 4, fair in 3, poor in 1
Ectopic ossification (EO): started to appear p.o. 26 days (8–39) in 9 patients
Classification of the extent of EO (Type I: Thickness<1 cm, Type II: ≥1cm)

<table>
<thead>
<tr>
<th>Type I (mild)</th>
<th>Type II (severe)</th>
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<tbody>
<tr>
<td>4</td>
<td>5</td>
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<tr>
<td>1: Arthrolysis for contracture</td>
<td>1: Excellent result due to spontaneous reduction of EO</td>
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<tr>
<td>3: Remained contracture</td>
<td>1: Complete ankylosis followed by arthrolysis</td>
</tr>
<tr>
<td></td>
<td>1: Remained contracture</td>
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<tr>
<td></td>
<td>2: Arthrolysis for contracture</td>
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There was an improvement in the mean flexion–extension arc of the four patients who underwent arthrolysis from 34° to 100° at the final follow-up.

Conclusions
In nine (60%) patients, EO was shown on radiograph, which was more than expected compared to previous reports. The reasons for this discrepancy following comminuted fracture are manifold: a high-energy trauma, delayed definitive fixation, high rate of bone grafting, and so on. Because most cases of EO appear by 6 weeks post-injury, careful radiographic follow-up and various modalities for prophylaxis against EO post-injury deserve consideration. Although even severe EO may rarely diminish spontaneously, more moderate EO usually results in functional impairment. Therefore, surgical treatment should be considered at the appropriate time.