

Should We Remove Clavicle Plates to Prevent Periprosthetic Fractures?

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Purpose: Clavicle fractures are common, representing 3% to 5% of all fractures and typically occurs in younger adults. Controversy exists regarding the removal of metalwork following clavicle fracture fixation, with some surgeons advocating removal of hardware to prevent a periprosthetic fracture. The aim of this study was to evaluate the rates of periprosthetic or refracture following removal or retention of a clavicle fixation plate with a minimum of 3 years follow-up.

Methods: Theater logs and a trauma database were used to identify all primary open reduction and internal fixation of clavicle fractures in adults from July 1, 2006 to April 30, 2016. Digital radiographs and patient notes were reviewed to identify fracture location, fixation, date of removal of metalwork, and outcomes. The primary outcome was periprosthetic or refracture following the primary clavicle fracture fixation.

Results: 518 patients underwent primary fixation of a clavicle fracture during the study period with a median follow-up of 7.38 years (range, 3.3-12.7). Mean age was 36 years (standard deviation [SD] 14) at time of surgery. 411 patients (79%) were male and mean time from injury to surgery was 14 (SD 41) days. 408 patients had diaphyseal fractures, 104 sustained lateral fractures (66 treated with hook plates), and 5 patients had medial third fractures. 118 patients (23%) had their metalwork removed with a united fracture at a mean of 304 days (SD 274) post-surgery. 57 standard and 61 hook plates were removed. 13 patients (2.5%) required revision surgery for nonunion. 8 patients (2%) who retained their plates sustained a periprosthetic fracture at a mean of 355 days (SD 289) post-surgery. 1 patient (0.8%) had a refracture at the site of removed metalwork 326 days after plate removal ($P = 0.69$). 3 of these peri-prosthetic fractures were observed in patients with hook plates, resulting in a periprosthetic fracture rate of 4.5% for hook plates. No patients who had hook plates removed sustained a refracture. No patients who required nonunion surgery sustained a periprosthetic fracture.

Conclusion: This study with long follow-up has shown rates of periprosthetic fractures following clavicle fracture fixation are low with no evidence that removing the plate reduces the periprosthetic fracture rate. We therefore do not recommend removing the plates to reduce periprosthetic fracture risk but will remove plates for other reasons (eg, persistent pain).