

Evidence-Based Surgery in Orthopaedics: Assessing the Change in Incidence of Surgical Treatment for Acute Midshaft Clavicle Fractures

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Purpose: In 2007, a randomized controlled trial published by the Canadian Orthopaedic Trauma Society (COTS) demonstrated improved functional outcomes and decreased rates of malunion and nonunion following operative treatment in midshaft clavicles. It is unknown what impact this positive trial has had on clinical practice. The objective of this study is to assess the response in orthopaedic clinical practice to Level-I evidence. This study aims to compare the rates of surgically treated clavicle fractures prior to and following the COTS trial. The secondary aim is to assess rates of malunion and nonunion of clavicle fractures relative to the rates of operative fixation.

Methods: This retrospective cohort study uses population-level administrative data from a public health system. Cases were identified by ICD-9 diagnostic codes and procedure fee codes for the health system. All patients over the age of 18 years with closed middle third clavicle fractures between 1997 and 2018 were included. A multivariable logistic regression model was used to compare the proportion of acute clavicle fractures treated operatively before and after 2007 controlling for patient factors. Pearson's χ^2 test was used to compare the proportion of malunion and nonunion procedures between the 2 cohorts.

Results: Following screening, 52,916 patients were included for data analysis. The mean age was 46.7 years and 65.6% were male. The rate of operative management of clavicle fractures increased between 1997 and 2018, with a sharp rise following publication and subsequent leveling off (Fig. 1). 7.1% of clavicle fractures were treated operatively after 2007, which was a significant increase compared to 2.1% prior to 2007 (odds ratio [OR] 3.50; $P = 0.001$). There was a small but significant increase in the rate of malunion or nonunion surgery over this same time (4.1% vs 3.5%; OR = 1.16; $P = 0.001$).

Conclusion: There has been a significant increase in the rate of surgically treated clavicle fractures over time in Canada, coinciding with the publication of the COTS randomized controlled trial. This demonstrates that orthopaedic practice responds rapidly to positive surgical trials.