

Adolescent Clavicle Fractures: Epidemiology and Risk of Reintervention Following Nonoperative Management

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Purpose: The primary aim of this study was to characterize the epidemiology of adolescent clavicle fractures with focus on reintervention and complications over a 10-year period from a large tertiary referral teaching hospital. The secondary aim was to compare the long-term clinical outcomes of operatively managed midshaft clavicular fractures against a control group of nonoperatively managed midshaft fracture with a minimum displacement of 2 cm to assess the impact of the malunion at long-term follow-up.

Methods: We retrospectively reviewed all adolescent fractures presenting to our region (13-17 years of age) over a 10-year period (2009-2019). Patient records and radiographs were accessed for demographics, injury classification, management, and complications. Long-term patient-reported outcomes in completely displaced midshaft fractures (>2 cm displacement) were compared between those that underwent acute fixation (n = 15) against a matched control group (n = 30) with QuickDASH (an abbreviated version of the Disabilities of the Arm, Shoulder and Hand [DASH]) and EQ-5D (EuroQol-5 Dimensions).

Results: 677 clavicles fractures occurred with an incidence of approximately 8 per 100,000 population per year. Mean age was 14.9 years (range, 13-17); 89% were male with an injury sustained in contact sports. The majority were midshaft (Edinburgh type 2, 89.5%) with either angulation (2A2, 39.8%) or simple fully displaced (2B1, 39.1%). Only 3% of all fractures underwent acute fixation (22/677). The majority of these were displaced midshaft (2A/B, 81%) or displaced lateral-end fractures (3A/B, 19%). The operatively managed midshaft fracture group was well matched to a control group and showed no significant difference in QuickDASH, EQ-5D, and satisfaction at long-term follow-up at approximately 7 years. Refracture occurred in 2.8% of all cases (n = 4 2A1, n = 8 2A2, and n = 7 2B1) at a median time of 611 days (range, 114-3063) and all of which united with nonoperative management. The location or angulation of fracture was not predictive of refracture (P = 0.61). There were 2 cases of nonunion encountered following nonoperative management (0.003%) and no corrective malunion osteotomy was undertaken at time of study completion.

Conclusion: Nonunion and repeat intervention is extremely rare following nonoperative management of adolescent clavicle fractures. Clavicle fracture displacement in adolescents does not appear to predict nonunion, refracture, or inferior function at long-term follow up.