

Effects of Injury and Social Factors on Functional Outcomes after Clavicle Fracture

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Purpose: Controversy exists regarding surgical indications for clavicle fractures. Practice patterns have shifted toward more operative care in recent years. The purpose of the study is to evaluate effects of patient demographic, injury, and social characteristics on functional outcomes of clavicle fractures.

Methods: 739 skeletally mature patients with clavicle fractures over a 14-year period were identified. At a mean of 56 months follow-up 214 patients completed the American Shoulder and Elbow Surgeons (ASES) survey. It is a 20-item questionnaire with scores up to 100 points, higher scores indicating better function. Effects of age, gender, fracture location, open fracture, associated injuries, tobacco or alcohol use, employment status, and type and timing of treatment were assessed.

Results: The mean ASES score for the entire group was 81.7. The study group was 73% male, with mean age 45.3 years (range, 16 to 89). Fractures were classified as medial (OTA 15-A, n = 15), midshaft (15-B, n = 157), and lateral (15-C, n = 39). 4% were open fractures. 77 (36.0%) were treated with plate fixation (ORIF [open reduction and internal fixation]), while 137 had nonoperative management; mean scores were 84.0 versus 78.5, respectively, $P = 0.054$. Further investigation revealed better ASES scores in surgical patients with lateral (88.8 vs 73.2, $P = 0.04$) and isolated (85.0 vs 69.6, $P = 0.02$) fractures compared to nonoperative patients. Those with clavicle fracture with concurrent head injury had better functional outcomes than isolated clavicle fractures when treated nonoperatively (84.6 vs 71.8, $P = 0.033$). Smokers (75.0 vs 82.9, $P = 0.003$) and unemployed (72.3 vs 84.6, $P < 0.001$) had the lowest ASES scores. With the numbers available, ASES scores were not associated with age, gender, or open fracture, with the exception of better ASES scores in 30-40 year olds with operative treatment versus nonoperative (90.9 vs 65.7, $P = 0.0008$). Surgical timing was not related to outcome for patients treated <10 weeks versus >10 weeks, and <20 weeks versus >20 weeks after injury (both $P > 0.36$).

Conclusion: Mean ASES scores showed good shoulder function in most patients. Indications for surgical care for clavicle fractures have been a topic of recent debate. This study provides insight for counseling patients on outcome expectations and highlights anatomical and social factors to be considered before determining a treatment plan. Additionally, initial nonoperative management for clavicle fractures may be a reasonable treatment plan with delay in surgical treatment showing no difference in ultimate outcomes.

	ORIF (n=77)	Non-operative (n=137)	All patients (n=214)
Men	85.1	79.3	81.6
Women	79.7	76.7	77.5
Smokers*	76.3	74.4	75.0
Non-Smokers [∞] *	86.8	80.7	82.9
Employed [∞] †	88.5	81.8	84.6
Unemployed †	69.5	73.3	72.3
Isolated [∞]	85.0	69.6	80.3
Chest trauma	81.3	78.8	79.4
Multiple trauma	83.3	79.7	80.6
p<0.05: *all smokers v non-smokers; † all employed v unemployed; [∞] ORIF v non-operative			

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.