

Can't Touch This: Ulnar Neuritis Following Distal Humerus Fracture Fixation: A Large Database Study

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Purpose: Intraoperative management of the ulnar nerve during distal humerus open reduction and internal fixation (ORIF) has been a topic of controversy with no clear guideline for management. The most common interventions are an in situ neurolysis or anterior subcutaneous transposition. Although the theoretical benefits of in situ neurolysis or anterior subcutaneous transposition may seem intuitive, recent evidence suggests that excessive manipulation of the nerve puts it at risk for injury. This study utilizes a large, commercially available insurance database to determine the impact of intraoperative ulnar nerve management during distal humerus ORIF on postoperative ulnar nerve neuritis.

Methods: A retrospective cohort analysis using data from the PearlDiver Mariner Database was performed. Patients undergoing ORIF of distal humerus fractures were identified using CPT codes. Concurrent ulnar nerve transposition, neuroplasty, or neurolysis was defined using CPT 64718, occurring on the same day as the index procedure. Patients with preexisting ulnar neuropathy within 1 year prior to the index procedure were excluded. The incidence of delayed ulnar neuropathy, occurring at least 2 weeks after surgery, was compared at 3, 6, 9, and 12 months. Multivariable logistic regression models were employed to evaluate the association between ulnar nerve transposition, neuroplasty, or neurolysis and the development of delayed ulnar neuropathy, adjusting for the effects of age, sex, insurance type, and Elixhauser comorbidity index.

Results: 16,881 patients who underwent distal humerus ORIF were identified. 2,016 (11.9%) underwent concurrent ulnar nerve transposition, neuroplasty, or neurolysis. The cohorts differed by age and insurance type ($P < 0.001$). 95 patients (0.6%) developed ulnar neuropathy within 2 weeks of surgery. Ulnar neuropathy between 2 weeks and 1 year occurred in 191 / 2,016 (9.5%) patients who received ulnar nerve transposition, neuroplasty, or neurolysis and 742 / 14,865 (5.0%) patients who did not ($P < 0.001$). Ulnar nerve transposition, neuroplasty, or neurolysis was associated with increased odds of delayed ulnar neuropathy at all time points ($P < 0.001$).

Conclusion: The overall rate of ulnar nerve neuropathy after distal humerus ORIF is 5.5%. Ulnar nerve transposition, neuroplasty, or neurolysis at the time of distal humerus ORIF nearly doubles the incidence of delayed postoperative ulnar neuritis.

Variable	Cohort		p-value
	Ulnar Nerve Transposition, Neuroplasty, Neurolysis (n = 2,016)	No Ulnar Nerve Transposition, Neuroplasty, Neurolysis (n = 14,865)	
Age, n (%)			<0.001
<35	233 (11.6)	2,075 (14.0)	
35-44	124 (6.2)	1,283 (8.6)	
45-54	198 (9.8)	1,566 (10.5)	
55-64	446 (22.1)	3,077 (20.7)	
≥65	1,015 (50.3)	6,864 (46.2)	
Sex, n (%)			0.14
Male	607 (30.1)	4,236 (28.5)	
Female	1,409 (69.9)	10,629 (71.5)	
Post-injury or post-operative ulnar neuropathy, n (%)	56 (2.8)	39 (0.3)	<0.001
Delayed ulnar neuropathy, n (%)			
3 months	72 (3.6)	189 (1.3)	<0.001
6 months	140 (6.9)	491 (3.3)	<0.001
9 months	168 (8.3)	661 (4.4)	<0.001
12 months	191 (9.5)	742 (5.0)	<0.001

Table 1. Cohort Demographics and Incidence of Ulnar Neuritis

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