Neurologic Safety in Olecranon Fracture Fixation: A Contemporary Single-Center Review

Montani, M[1]; Haziza, S [1]; Vosbikian, M [1]; Ahmed, I [1]
[1]Rutgers, New Jersey Medical School, Newark NJ

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Background: Olecranon fractures account for approximately 10 % of adult upper-extremity fractures and are commonly treated operatively with tension-band wiring or plate fixation. Although hardware-related complications have been widely studied, the incidence of postoperative nerve palsy of any kind remains poorly defined. The purpose of this study was to estimate the incidence of postoperative nerve palsy following operative fixation of isolated olecranon fractures at a single academic Level I trauma center and determine whether the emphasis on AIN injury, ulnar nerve palsy or others in surgical education is supported by real-world data. We hypothesized that postoperative nerve palsy following olecranon fracture fixation would be uncommon in contemporary surgical practice.

Methods: A retrospective chart review was conducted of all adult patients who underwent operative fixation of isolated olecranon fractures at a single academic Level I trauma center between January 2010 and May 2025. Patients with concomitant upper-extremity injuries, periprosthetic fractures, or inadequate postoperative follow-up were excluded. Demographic data including age, sex, BMI, comorbidities, smoking status, injury mechanism, and laterality and surgical variables, including construct type, tourniquet use, operative time, and fixation method were recorded. Postoperative nerve palsy was defined as any new motor or sensory deficit of the ulnar, median, anterior interosseous (AIN), or posterior interosseous (PIN) nerves persisting beyond anesthesia recovery and documented by the treating surgeon at any follow-up visit. All cases were reviewed in the electronic medical record and operative reports to verify accuracy.

Results: The cohort was predominantly male (70.0%), with a mean age of 38.9 years. Most injuries were closed (85.4%), caused by falls (49.4%), and treated with plate fixation (96.6%). The median follow up was ~78 days. No cases of postoperative ulnar, median, anterior interosseous, or posterior interosseous nerve palsy attributable to surgery were identified. One patient experienced transient median sensory changes after a regional block, which later resolved.

Conclusions: Postoperative nerve palsy following olecranon fracture fixation was not observed in this single-center series, suggesting that such complications are exceedingly rare in modern surgical practice. These results likely reflect advances in implant design, surgical exposure, and neuroanatomic awareness that have reduced iatrogenic nerve injury risk. The predominance of plate fixation in this cohort further supports its safety profile relative to older tension-band techniques. Larger multicenter studies with standardized neurologic reporting are warranted to confirm these findings and better define true incidence.

Significance/Clinical Relevance: Postoperative nerve palsy following olecranon fracture fixation was not observed in this single-center series, suggesting that such neuropathic complications are exceedingly rare in modern surgical practice. These findings provide reassuring real-world evidence that current operative techniques and anatomic awareness effectively minimize neurologic risk.

Images and Figures

Demographic Characteristics	
Sex	
Male (%)	62 (70%)
Female (%)	27 (30%)
Age (SD)	38.9 years (SD 17.5)
BMI (SD)	26.1 kg/m^2 (SD 4.84)
Smoker (%)	34 (38%)
Diabetic (%)	6 (6.7%)
Laterality	
Left	54 (60.6%)
Right	35 (39.4%)
Wound Integrity	
Open	12 (14.6%)
Closed	77 (85.4%)
Mechanism	
Fall	44 (49.4%)
Ped vs. MV	14 (15.7%)
Assault	9 (10.1%)
GSW	8 (9.0%)
Non-motorized vehicle accident	2 (2.2%)
Sports Related Injury	1 (1.1%)

Table 1: Demographic Characteristics

Surgical Characteristics	
Time to Surgery (IQR)	1 day (1-5 days)
Fixation Construct	
Tension Band Wire	3 (3.4%)
Plate and Screws	86 (96.6%)
Other	0 (0.0%)
Tourniquet	54 (60.6%)
Operative Time (IQR)	182 min (145-243 min)
Follow up time (IQR)	78 days (32-161 days)
Post operative Nerve Complication	0 (0.0%)

Table 2: Surgical Characteristics