

Preservation versus Sacrifice of the Supraclavicular Nerves During Clavicle Open Reduction and Internal Fixation (ORIF)

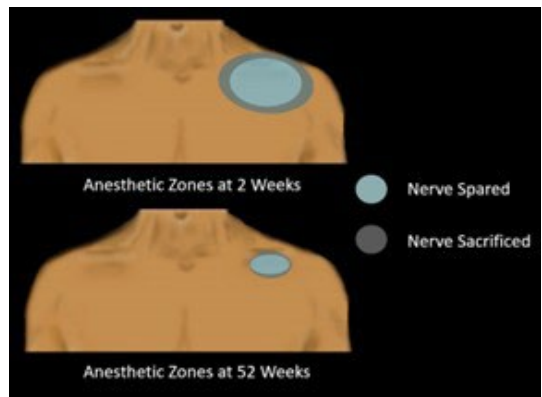
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Purpose: Clavicle fractures make up 2.6% to 5% of all fractures. Despite the benefits of surgery, postoperative chest wall symptoms are well-known complications with reported incidence from 10% to 80% of the time due to iatrogenic injury of branches of the supraclavicular nerve that provide sensation over the anteromedial shoulder and proximal chest. The purpose of our study is to discover differences between nerve-sparing and nerve-sacrificing techniques during open reduction and internal fixation (ORIF) of clavicle fractures.

Methods: This is a prospective, partially blinded, single center, randomized controlled trial. Patients who presented to our hospital after sustaining a closed, isolated, displaced, mid-shaft clavicle fracture and underwent operative fixation were consented and randomized to either the “nerve-sacrificing” or “nerve-sparing” group. During postoperative follow-up, Semmes-Weinstein monofilament testing of the supraclavicular area was performed by a trained research assistant. Measurements were mapped onto a standardized grid to determine the area of anesthesia. Patient-reported outcomes (PROs) including symptom severity, and single assessment numerical evaluation (SANE) scores were obtained at follow up visits.

Results: 39 patients were included in the final study cohort. 21 were randomized to “nerve-sacrificed”, and 18 to the “nerve-spared” group. There were no statistically significant differences in age (41.5 vs 46.6 years, $P = 0.18$) or gender ratio (28.6% female vs 16.7% female, $P = 0.46$). 71.8% of patients had greater than 6 months of follow-up and 100% achieved union. The area of anesthesia in the “nerve-sparing group” decreased from $62.1 \pm 61.1 \text{ cm}^2$ at 2 weeks to $10.9 \pm 14.5 \text{ cm}^2$ at 1 year. In the “nerve-sacrificing group” the area decreased from $73.9 \pm 45.2 \text{ cm}^2$ to $20.3 \pm 24.2 \text{ cm}^2$. This represented a statistically significant difference at all time points (2, 12, 24, and 52 weeks). Unadjusted SANE scores increased from 50.4 ± 17.7 at 2 weeks to 95.6 ± 8.0 at 1 year in the nerve-sparing group. The nerve-sacrificing group increased from 57.9 ± 20.1 to 90.2 ± 9.9 . This did not represent a statistically significant difference between groups. Additionally, symptom severity scores showed similar improvements in both cohorts with no statistically significant differences.

Conclusions: Our study demonstrates that sparing the supraclavicular nerve during ORIF of clavicle fracture results in decreased chest-wall numbness which persists through the 1-year postoperative period but may not provide clinically significant improvements in function compared to sacrificing the nerve.



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.