

# Neurectomy and Neurolysis Significantly Improves Pain from Superficial Peroneal Nerve Entrapment and Neuroma Formation

Terry L Hayes, Ignacio Garcia Fleury, Christopher Cychosz, Joseph A Buckwalter, John E Femino

**INTRODUCTION:** Peripheral nerve injury or entrapment is a common complication following surgery in the foot and ankle region. The superficial peroneal nerve is particularly at risk following ankle arthroscopy and lateral approaches to the ankle or fibula. Symptoms can result in intense pain and significant disability for patients. The purpose of this study is to investigate the outcomes of superficial peroneal nerve neurolysis and neurectomy.

**METHODS:**

All patients were identified who underwent operative treatment by two foot and ankle specialists for superficial peroneal nerve related pain. Exclusion criteria included patients under the age of 18, prisoners, those who underwent concomitant osseous procedures, and less than 6-week follow-up. Demographic data, baseline outcomes including FFI, SF-36, FAAM, and VAS were recorded. Final follow-up questionnaires using PROMIS measures and FAAM were administered using REDCap.

**RESULTS:**

Fifty-five patients met the inclusion criteria for this study with a median age of 43.0 years (interquartile range [IQR], 33.0-48.0). At a median follow-up duration was 6.8 months (IQR 1.2-20.2 months), VAS improved from a median of 9.0 (IQR 6.0-9.0) preoperatively to 2.0 (IQR 0.00-5.0) after surgery,  $p < 0.05$ . Patients reported a median VAS improvement of 4.0 (IQR 2.0-7.0). At final follow-up patients reported PROMIS lower extremity function score median of 58.6 (IQR 45.2-58.6), PROMIS neuropathic pain quality score of 42.9 (IQR 37.2-55.5), and PROMIS pain interference of 50.5 (IQR 41.1-57.0). Worker's compensation claims were independently associated with significantly poorer post-operative function measured using FAAM ADL (58.58 WC vs 74.86 non-WC,  $p < 0.02$ ) and higher post-operative VAS scores (4.46 WC vs 2.36 non-WC,  $p < 0.01$ ). Patients with current or recent tobacco use within 3 months leading up to surgery reported significantly higher post-operative VAS pain scores compared to nonsmokers (4.54 vs 2.47,  $p < 0.02$ ), although post-operative FAAM ADL score differences did not reach a level of significance in this group (75.73 vs 58.93,  $p = 0.10$ ).

**DISCUSSION AND CONCLUSION:** Neurectomy or neurolysis has potential to significantly improve somatic pain for entrapment or neuroma formation of the superficial peroneal nerve. Tobacco use as well as worker's compensation claims were associated with significantly poorer outcomes. Further studies are needed to optimize perioperative management and surgical techniques for these patients.

Table 1. Overall Outcomes Following SPN Neurectomy/Neurolysis

Table 2. Postoperative Outcomes by Risk Factors

Outcome Measure	Preoperative Median (IQR)	Postoperative Median (IQR)	p-value
VAS Pain Score	9.0 (6.0-9.0)	2.0 (0.0-5.0)	< 0.05
VAS Pain Score Improvement		4.0 (2.0-7.0)	
PROMIS Lower Extremity Function	-	58.6 (45.2-58.6)	-
PROMIS Neuropathic Pain Quality	-	42.9 (37.2-55.5)	-
PROMIS Pain Interference	-	50.5 (41.1-57.0)	-

Risk Factor	FAAM ADL Score (Median)	VAS Pain Score (Median)	p-value (FAAM)	p-value (VAS)
Workers' Compensation	58.6	4.46	< 0.02	< 0.01
Non Workers' Compensation	74.9	2.36		
Tobacco Use (past 3 mos)	58.9	4.54	0.10 (NS)	< 0.02
No Tobacco Use	75.7	2.47		