

# Neuralgic Amyotrophy Following Robotic Nipple-Sparing Mastectomy; A Case Report

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## Introduction

Neuralgic amyotrophy (NA, Parsonage-Turner syndrome) is an acute inflammatory brachial plexus neuropathy causing sudden, severe shoulder pain and multifocal upper limb weakness. While triggers include surgery, NA following breast cancer surgery is rarely reported. Postoperative unilateral arm weakness is often misattributed to positional compression or direct nerve injury, causing NA to be overlooked. This report highlights NA as a vital differential diagnosis for postoperative upper limb weakness following breast surgery.

## Case report

A 47-year-old female underwent a robotic-assisted right nipple-sparing mastectomy, sentinel lymph node biopsy, and immediate direct-to-implant reconstruction for invasive ductal carcinoma of the right breast on October 28, 2025. Immediately post-surgery, she developed sharp right shoulder pain. On postoperative day (POD) 1, right upper extremity weakness emerged. Manual muscle testing (MMT) showed grade 2/5 for shoulder flexion and abduction, and grade 4/5 for elbow flexion; wrist and finger strength were normal. Hypoesthesia and tingling extended across the right lateral upper limb down to the 1st and 2nd digits.

Electrodiagnostic studies performed two weeks postoperatively demonstrated a patchy, fascicular pattern of involvement suggestive of NA. Notably, the sensory nerve action potential (SNAP) of the right lateral antebrachial cutaneous (LABC) nerve was unrecordable, whereas all other major sensory and motor nerve conductions were entirely normal without evidence of conduction block. Furthermore, needle EMG demonstrated active denervation at rest localized to the right supraspinatus and deltoid muscles (Table 1).

A brachial plexus MRI was performed, which aided in the diagnosis of NA. The imaging revealed thickening at the right brachial plexus trunk, along with high T2 fat-suppressed signals indicating edema in the right supraspinatus, infraspinatus, and deltoid muscles (Figure 1). Concurrent cervical and brain MRIs were unremarkable, ruling out central structural lesions.

Oral prednisolone (1 mg/kg/day) was given from POD 14 for one week, then tapered. By POD 28, shoulder strength reached MMT grade 3, elbow strength normalized, and sensory deficits improved by 70%.

### A. Nerve Conduction Study

Sensory	Left [Amp (μV) / CV (m/s) / Lat (ms)]	Right [Amp (μV) / CV (m/s) / Lat (ms)]
Median	49 / 62 / 2.8	55 / 63 / 2.6
Ulnar	47 / 56 / 2.5	33 / 53 / 2.5
Radial	39 / 58 / 1.8	36 / 65 / 1.4
Medial antebrachial cutaneous	8 / 59 / 2.3	9 / 63 / 1.7
Lateral antebrachial cutaneous	22 / 70 / 1.3	NR / - / -
Motor	Left [Amp (mV) / CV (m/s) / Lat (ms)]	Right [Amp (mV) / CV (m/s) / Lat (ms)]
Median	10.6 / 63 / 5.0	11.2 / 63 / 5.2
Ulnar	8.8 / 63 / 4.9	10.6 / 58 / 5.1
Radial	2.9 / 64 / 4.1	3.9 / 59 / 5.2
Musculocutaneous	3.4 / - / 5.9	3.6 / - / 5.7
Axillary	6.3 / - / 7.6	6.9 / - / 7.0

### B. Needle Electromyography

Muscle	Insertional	Spontaneous Activity			Volitional MUAPs			
	Insertional	Fibs	PW	Fasc	Duration	Amplitude	Phase	Recruitment
Right supraspinatus	Inc IA	+	+	+	Normal	Normal	Normal	Reduced
Right biceps brachii	Normal	None	None	None	Normal	Normal	Normal	Normal
Right deltoid	Inc IA	+	+	+	Normal	Normal	Normal	Reduced

**Table 1. Electrodiagnostic findings of the upper extremities two weeks after surgery**

The table demonstrates an unrecordable sensory nerve action potential of the right lateral antebrachial cutaneous nerve and active denervation changes in the right supraspinatus and deltoid muscles, findings consistent with patchy and fascicular involvement in neuralgic amyotrophy.



**Figure 1. Brachial plexus magnetic resonance imaging (MRI) consistent with neuralgic amyotrophy. (A)** Axial T2-weighted fat-suppressed image demonstrates thickening and hyperintensity of the right brachial plexus (oblique red arrow), along with high signal intensity in the right supraspinatus muscle indicating denervation edema (vertical red arrow). **(B)** Coronal T2-weighted fat-suppressed image shows swelling and hyperintensity along the right brachial plexus (oblique red arrow) compared to the unaffected contralateral side.

## Discussion

NA is an inflammatory neuropathy with a patchy, fascicular pattern of nerve involvement. Postoperative weakness initially suggested mechanical injury, but combined MRI and electrodiagnostics confirmed NA. While MRI localized the lesion to the trunk level, electrodiagnostics ruled out a typical upper trunk syndrome, which uniformly affects terminal branches. Instead, they revealed selective fascicular-level involvement. This was evidenced by sensory-motor dissociation (isolated LABC SNAP loss, normal musculocutaneous conduction) and patchy deltoid denervation despite normal axillary conduction. Thus, when severe pain and ipsilateral upper limb weakness develop after breast cancer surgery, NA must be considered.