



Effective Pain Management in Complex Regional Pain Syndrome and Radial Nerve Palsy through Peripheral Nerve Catheterization

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Introduction

- Complex Regional Pain Syndrome (CRPS)¹:**
 - Characterized by pain, sensory abnormalities, decreased range of motion, autonomic changes, and patchy bone demineralization
 - Type 1: Without evidence of peripheral nerve injury. About 90% of patients
 - Type 2: Evidence of peripheral nerve injury present
 - Often follows injury
- Perioperative Pain Management²:**
 - Exceptionally challenging due to multifaceted nature
 - Neuropathic and inflammatory pain components
- Peripheral Nerve Catheterization³:**
 - Promising approach
 - Targeted, continuous analgesia
 - Potential to improve patient outcomes and quality of life

Our patient's surgical incision status post surgery

Materials and Methods

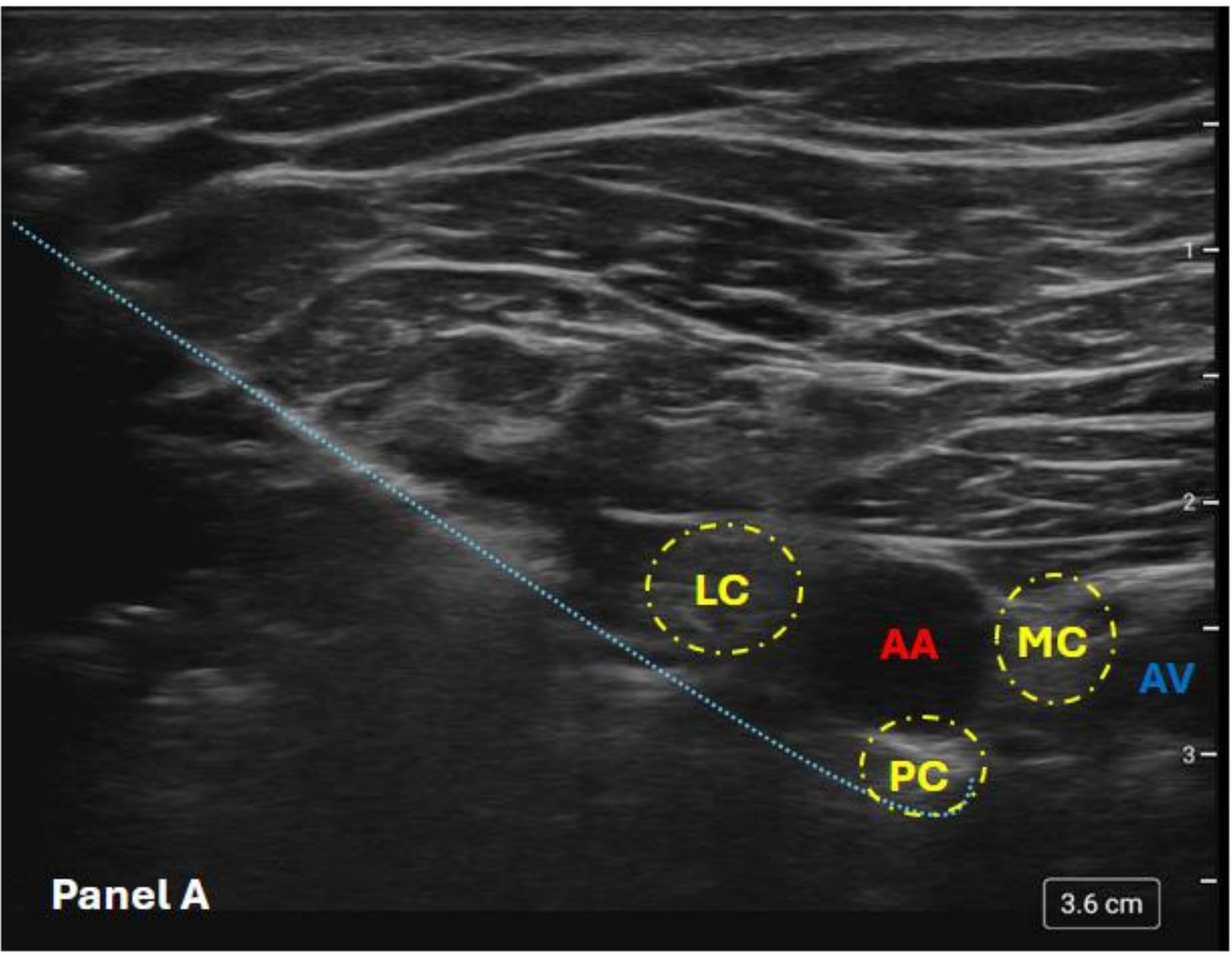
As the case report is devoid of patient identifiable information, it is exempt from IRB review requirements as per Mayo Clinic policy 45 CFR 46.102. Patient consent was obtained for submission of this report.



Case Report

- Patient Information:**
 - 58-year-old, 91 kg
 - Left elbow revision arthroplasty with allograft prosthetic composite due to direct infection
- Medical History:**
 - Complex Regional Pain Syndrome Type 2 (CRPS)
 - Prosthetic fungal and bacterial infection (status post removal with antibiotic spacer)
 - Significant bone loss and muscular atrophy
 - Radial nerve palsy (trauma in 2012, poor prognosis for return of function)
 - Six prior elbow washout and debridement surgeries
 - Previous revision and implantation/removal of second elbow prosthesis and antibiotic spacer (7 months prior)
 - Latissimus free flap and split-thickness skin grafting due to poor surgical wound healing
- Baseline Neurology Exam:**
 - Absence of finger and wrist extension
 - Flexed wrist posturing
 - Absence of flexion/extension at the elbow (due to in situ antibiotic spacer)
 - Severe muscle atrophy
- Pain Management History:**
 - Stellate ganglion block for severe limb paresthesia
 - History of high-dose narcotic and pregabalin use (self-weaned due to ineffectiveness)
 - Severe and poorly controlled post-operative pain despite perioperative ketamine
- Perioperative Management:**
 - Preoperative infraclavicular catheter with 30 cc of 0.5% bupivacaine with 1:200,000 epinephrine
 - Intraoperative use of 10 mg methadone and ketamine infusion at 0.2 mg/kg/hr (continued post-operatively)
- Post-operative Outcome:**
 - Excellent pain control with pain averaging 3-4/10
 - Discharged home on POD 3 with On-Q home infusion pump (0.2% bupivacaine at 8 cc/hr)
 - Follow-up: Outstanding pain control during recovery without adverse effects

Figure 1: Infraclavicular catheter sonoanatomy with panel A labeled; panel B unlabeled



Discussion

- Decision Making:**
 - Preoperative infraclavicular catheter placement
 - Preoperative local anesthetic bolus
- Post-operative Neurology Exam⁴:**
 - Standard post-operative neurology exam was omitted
 - Typically performed to evaluate post-operative nerve function after total elbow arthroplasty (due to potential intraoperative ulnar nerve injury)
- Outcomes:**
 - No long-term sequelae from nerve catheter placement
 - Superior pain control compared to previous surgeries

LC: Lateral cord PC: Posterior cord
MC: Medial cord AA: Axillary artery
AV: Axillary vein Blue line: needle

References

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