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Continuous Interscalene Block for Postoperative Analgesia and Shoulder Immobilization After Pectoralis Major Tendon Reinsertion: A Case Report

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We present the case of a 38-year-old man undergoing surgical repair of his pectoralis major tendon. An interscalene catheter was placed between the middle and lower trunks of the brachial plexus. Postoperatively, ropivacaine 0.2% was infused through postoperative day 3. The patient had excellent pain control requiring minimal opioid analgesics. A catheter between the middle and lower trunks of the brachial plexus provided excellent postoperative analgesia after pectoralis major tendon reinsertion. Additionally, the block likely protected the surgical repair during emergence from anesthesia and in the early postoperative period by providing a motor block of the pectoralis major muscle. (A&A Case Reports. 2017;9:175–7.)

The rupture of the pectoralis major muscle at its insertion site on the anteromedial proximal humerus, first described by Pattissier in 1822, is an exceedingly uncommon injury[1,2] and does not always necessitate surgery. Consequently, literature on the anesthetic and analgesic aspects of the surgical repair is sparse. The injury has primarily been reported in the orthopedic literature in sporadic case reports and small case series.[1,2] Although the injury occasionally occurs in elderly patients resulting from a brisk force applied to atrophic muscle, it is more common in young high-performance athletes as a result of eccentric muscle contraction. In these patients, surgical repair is recommended to restore function.[2]

Surgical repair of the pectoralis major tendon is performed using a modified deltopectoral approach, with an incision that is proximally more medial and distally more lateral compared to traditional shoulder surgery, to expose the retracted pectoralis muscle.[2] Postoperative pain presents a challenge to conventional regional anesthetic techniques because of the large incision, which extends from the C5 to T2 dermatomes (Figure 1), and painful stretching of the muscle fibers of the pectoralis major, innervated by C5–T1.

A regional anesthetic technique can provide an additional benefit when performed prior to repair of the pectoralis major muscle by blocking motor innervation to the muscle. The pectoralis tendon repair, performed using sutures to anchor the ruptured tendon to bone is susceptible to rupture during an agitated emergence from anesthesia and in the early postoperative period. Postoperatively, the patient's arm is usually immobilized in a sling for 30 days.[1] A motor block of the pectoralis major muscle may protect the repair during emergence from anesthesia and in the early recovery period.

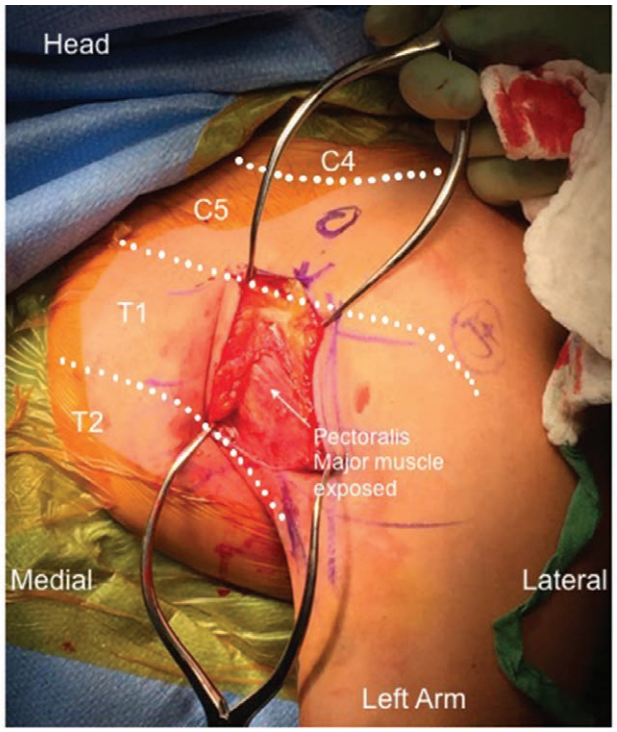

Figure 1. Surgical incision on the anterior chest wall medial to the deltopectoral groove for pectoralis major tendon reinsertion with approximate dermatome boundaries marked. Incision extends from C5 to T1 dermatomes.

There has been only a single case report describing a regional anesthetic technique for postoperative analgesia and immobilization after pectoralis major tendon reinsertion using a single-injection perineural block.[3] The paucity of publications related to this painful surgery reflect the rarity of the injury. We now report a case in which an interscalene perineural catheter placed between the middle and lower trunks of the brachial plexus was used to provide excellent postoperative analgesia following pectoralis major tendon reinsertion.

The University's Institutional Review Board (University of California San Diego, San Diego, CA) waives any review requirements for case reports or short series, but the patient signed an informed consent form permitting the use of his

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relevant medical history, sonographic imaging, and photographs taken during the procedure for publication in the form of a case report.

CASE REPORT

A 38-year-old man presented 2 weeks after sustaining a rupture of his pectoralis major tendon when his arm was forcefully abducted while surfing. An ultrasound-guided interscalene perineural catheter was placed to provide postoperative analgesia and protect the tendon repair by immobilizing the shoulder.

Using a linear probe (13–6 MHz, HFL38; M-Turbo; SonoSite, Bothell, WA), the trunks of the brachial plexus were identified (Figure 2, A and B). A 17-gauge Tuohy needle was inserted between the middle and lower trunks of the plexus with an in-plane ultrasound-guided technique. Twenty milliliters of 2% lidocaine with 1:400,000 epinephrine was injected with frequent aspiration to avoid intravascular injection (Figure 2, C and D). A flexible 19-gauge catheter was inserted between the middle and lower trunks under direct ultrasound visualization (Figure 2, E and F). The catheter was secured, and position was confirmed by injection of 0.5 mL of air (Figure 2, G and H). An infusion of 0.2% ropivacaine was started preoperatively with a basal rate of 8 mL/h and bolus of 4 mL available every 30 minutes.

Intraoperatively, the patient received 150 µg of fentanyl during induction of general anesthesia. Following intubation, anesthesia was maintained with sevoflurane and nitrous oxide. With no additional opioids, the patient reported 0 of 10 pain on a Numeric Rating Scale in the recovery unit. He was discharged home with the perineural catheter in place and a portable infusion pump (ambIT; Summit Medical Products, Sandy, UT).

On the first postoperative day, the patient reported that he had only minor discomfort with daily activities with a maximum pain score of 4 of 10 on the Numeric Rating Scale. He reported using 2 tablets of 5 mg oxycodone and 325 mg acetaminophen. The patient reported excellent pain control on postoperative day 2 requiring no supplementary analgesics and using only the ropivacaine bolus to reinforce the block. The patient reported removing his catheter without difficulty on postoperative day 3. Following catheter removal, the patient required a total of 60 mg oxycodone and 3900 mg acetaminophen for the remainder of the day. On the fourth postoperative day, the patient reported full resolution of the nerve block; although his pain control improved somewhat, he continued requiring oral opioid analgesics.

DISCUSSION

This case illustrates that an interscalene catheter placed with the tip of the catheter between middle and lower trunks is an option for postoperative analgesia and shoulder immobilization following pectoralis major tendon reinsertion.

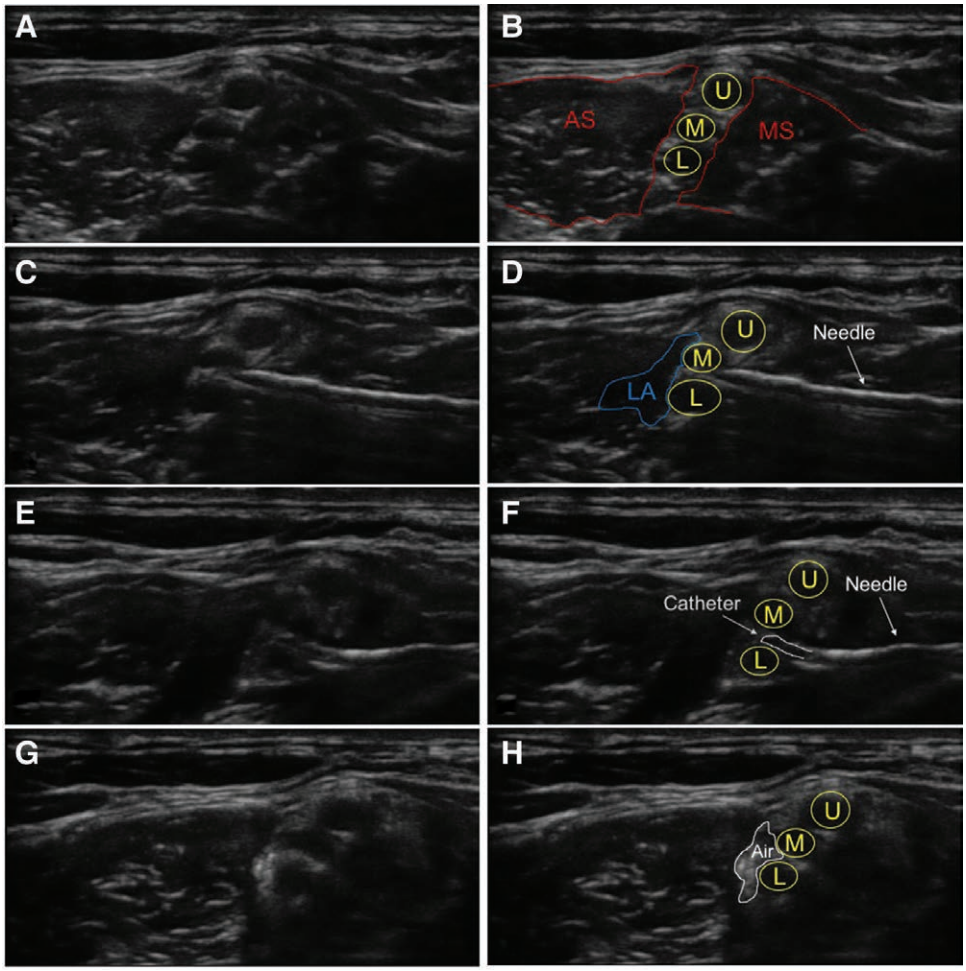

Figure 2. A and B, Ultrasound images of the brachial plexus at level of upper (U), middle (M), and lower (L) trunks. AS and MS muscles border the plexus anteriorly and posteriorly. C and D, LA deposited between middle (M) and lower (L) trunks of the brachial plexus. E and F, Catheter threaded between middle (M) and lower (L) trunks. G and H, Position of catheter confirmed with injection of air. AS indicates anterior scalene; LA, local anesthetic; MS, middle scalene.

Placing the catheter at this location likely allowed tracking of the local anesthetic infusion to cover the C5–T1 dermatomes, effectively providing analgesia to the location of the surgical incision.

It is common at our institution to remove perineural catheters by the third postoperative day due to concern for an increased risk of infection subsequent to this time point. However, as illustrated by this patient's high opioid analgesic requirement following discontinuation of the ropivacaine infusion, there are patients and surgical procedures that justify the risk of leaving the catheter in place for a longer period. Given the painful nature of this surgery and the extended period of postoperative immobilization, pectoralis tendon reinsertion falls into this category. Additionally, we recommend use of regional analgesia as part of a multimodal pain management strategy. If amenable to the surgeon, we recommend concomitant use of nonsteroidal antiinflammatory drugs and acetaminophen to reduce opioid consumption.

The pectoralis major is innervated by the lateral (C5–7) and medial (C8–T1) pectoral nerves. Respectively, these nerves are branches of the lateral and medial cords of the brachial plexus arising distal to the location of our perineural catheter. We hypothesized that an infusion of local anesthetic through a catheter located between the middle and lower trunks of the brachial plexus would induce a motor block of the pectoralis major muscle. However, we were unable to assess the motor block in the recovery unit due to the strict immobilization instructions. Assuming the ropivacaine infusion resulted in at least a partial motor block of the pectoralis major muscle, the location of the catheter not only provided excellent analgesia for the patient but also helped protect the fragile repair during emergence from anesthesia and in the early postoperative period. While a randomized controlled clinical trial would be optimal to provide data on postoperative analgesia following pectoralis major tendon reinsertion, the rarity of this injury requiring surgical repair will likely preclude such an investigation. ■

DISCLOSURES

Name: John J. Finneran IV, MD.
Contribution: This author helped perform the case and write the manuscript.
Conflicts of Interest: None.
Name: Brian M. Ilfeld, MD, MS.
Contribution: This author helped consult on the case, and write and edit the manuscript.
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Name: Jacklynn F. Sztain, MD.
Contribution: This author helped supervise the case, and write and edit the manuscript.
Conflicts of Interest: None.
This manuscript was handled by: Raymond C. Roy, MD.

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