

Introduction

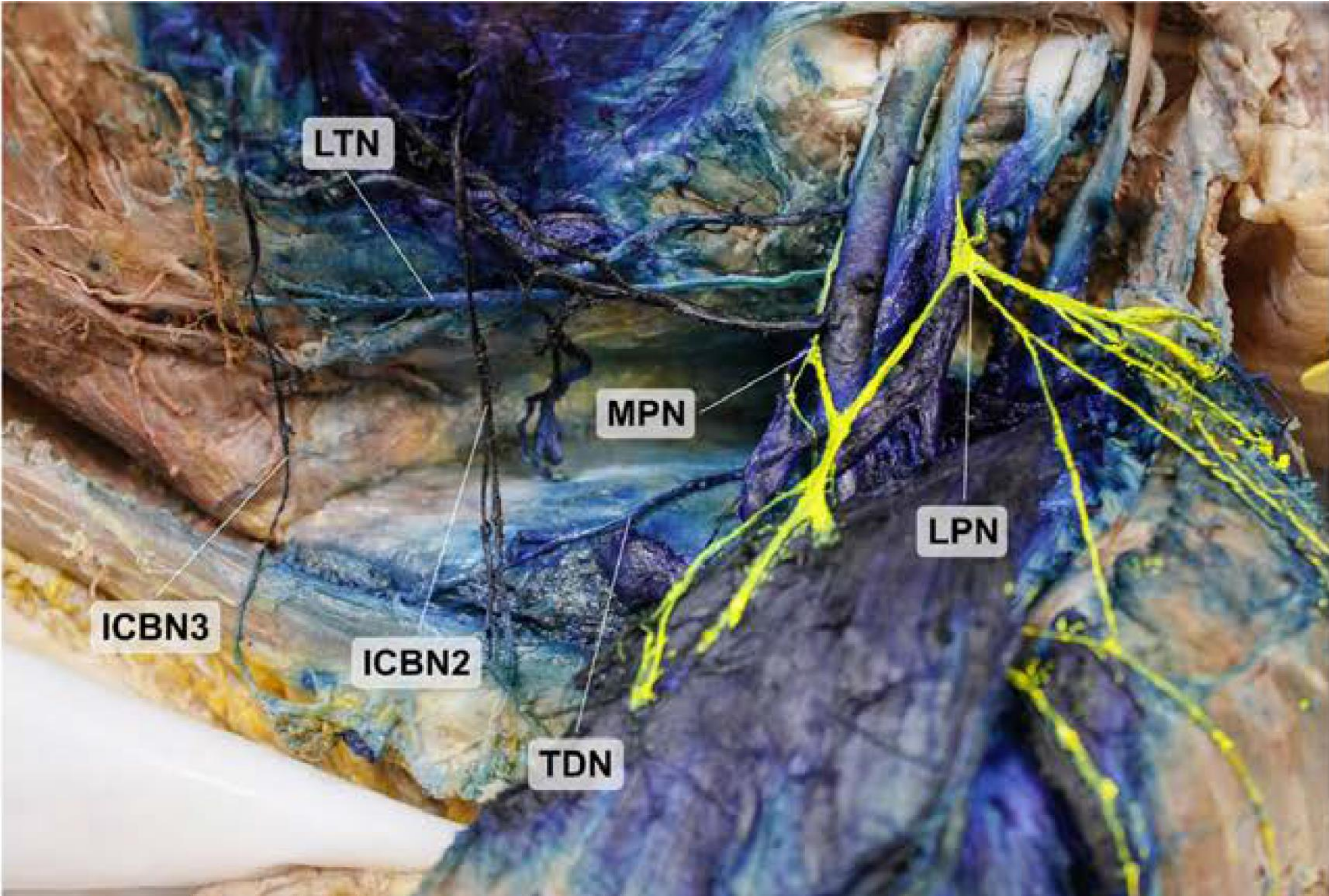
Arteriovenous fistula (AVF) surgeries involving the medial upper arm and axilla often need supplemental coverage by an intercostobrachial nerve block in addition to the supraclavicular or infraclavicular nerve block. The intercostobrachial nerve (ICBN) may branch into multiple smaller nerves and is typically derived from the 2nd thoracic spinal nerve (3). There is no official consensus on the type of nerve block that should be used for anesthetizing the ICBN. PECS II has been described as a method to anesthetize the upper medial arm (4). We attempt to show that targeting above rib 3 provides reliable intercostobrachial nerve coverage for medial upper arm coverage during AVF creation. Three patients received PECS II block as supplementation to supraclavicular nerve blocks for AVF surgery requiring medial upper arm coverage.

Methods

The PECS II nerve block was performed by using a cranial/caudally directed linear 13-6 Sonosite SII ultrasound transducer probe. First, the axillary vein was identified over the 2nd rib and then the 3rd rib was identified. Subsequently 20 mL of 0.2% ropivacaine was injected into the plane between the pectoralis minor and serratus anterior above the 3rd rib. Then a supraclavicular nerve block was also performed with 20-25 mL of ropivacaine 0.5% injected into the brachial plexus at the supraclavicular level. The medial upper arm and axilla were then checked with ice pre-operatively to ensure loss of temperature sensation. Pre-surgically forceps were used to test analgesia of the arm and axilla. Intraoperative anesthetic choice, amount of local anesthetic given by the surgeon, post-operative pain, and post-operative analgesics were examined.

Table and Figure

	PECS 2 local + dose	Supraclavicular local + dose	preop meds	intraop meds	surgeon local	post op pain	post op meds
Patient 1	20 mL of 0.2% ropivacaine	25 mL of 0.5% ropivacaine	Tylenol 650	midazolam 2 mg Precedex 8 mcg	no	0	0
Patient 2	20 mL ropivacaine 0.2%	20 mL ropivacaine 0.5%	no	Precedex 12mcg	no	0	0
Patient 3	20 mL ropivacaine 0.2%	20 mL of ropivacaine 0.5%	no	Tylenol 1000 mg IV Precedex 8mcg versed 2mg	no	0	oxycodone 5mg



(Robinson et al.)

Results

All 3 patients had good pain control during and after the surgery. One patient received oral acetaminophen 650mg preoperatively. All 3 patients underwent monitored anesthesia care and received dexmedetomidine intraoperatively with some also receiving midazolam and IV acetaminophen intraoperatively. No additional local anesthesia was given by the surgeon in any of the cases. During their PACU stay all three scored 0 out of 10 for pain. One patient received 5mg of oral oxycodone in PACU, however had 0 pain documented in the chart. PECS II appears to effectively anesthetize the medial upper arm and axillary region with no adverse effects.

Discussion

Cadaver studies on the PECS II / serratus anterior blocks have shown coverage of the intercostal nerves (2) (3). The intercostobrachial nerve is a branch of T2 intercostal nerve, so it is theoretically covered by the PECS II nerve block. We demonstrate that the three patients receiving the PECS II nerve block for AVF surgery requiring medial arm and axilla analgesia were successfully anesthetized with no residual pain during their PACU stay. Thus, the PECS II block may be a suitable regional adjunct for AVF surgeries. PECS II combined with the supraclavicular block is dense and requires less local anesthesia when compared to the triple block: interscalene, supraclavicular, and intercostobrachial nerve blocks.

References

1. Cole NM, Vlassakov K, Brovman EY, Heydarpour M, Urman RD. Regional Anesthesia for Arteriovenous Fistula Surgery May Reduce Hospital Length of Stay and Reoperation Rates. Vasc Endovascular Surg. 2018;52(6):418-426. doi:10.1177/1538574418772451
2. Kunigo T, Murouchi T, Yamamoto S, Yamakage M. Spread of injectate in ultrasound-guided serratus plane block: a cadaveric study. JA Clin Rep. 2018;4(1):10. doi:10.1186/s40981-018-0147-4
3. Robinson H, Mishra S, Davies L, et al. Anatomical Evaluation of a Conventional Pectoralis II Versus a Subserratus Plane Block for Breast Surgery. Anesth Analg. 2020;131(3):928-934. doi:10.1213/ANE.0000000000005039
4. Purcell N, Wu D. Novel use of the pecs II block for upper limb fistula surgery. Anaesthesia 2014; 69: 1294.