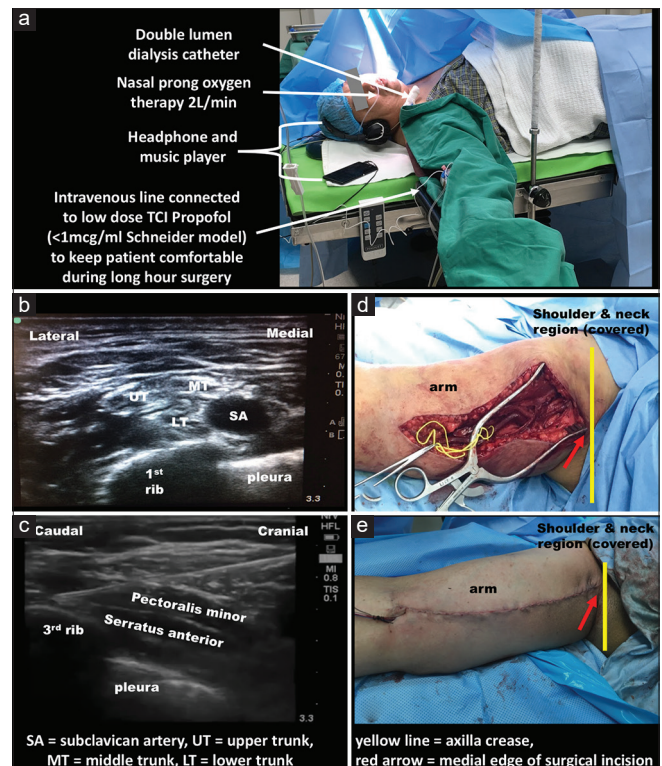


## Ultrasound-guided combined supraclavicular brachial plexus and PECS II blocks for brachiobasilic fistula transposition surgery

Sir,

We would like to share our method of providing regional block for brachiobasilic fistula (BBF) transposition surgery with ultrasound-guided combined supraclavicular brachial plexus and pectoral nerve (PECS) II block. We had a case series of ten patients who successfully underwent second-stage BBF transposition surgery with ultrasound-guided combined supraclavicular brachial plexus block (20 ml ropivacaine 0.5%) and PECS II block (20 ml ropivacaine 0.25%). None required local anesthetic (LA) infiltration by surgeon. The blocks were performed using a linear probe (Sonosite M-Turbo, Bothell, Washington, USA) and a 100-mm, 21-gauge needle (Stimuplex A, Braun, Melsungen, Germany). Majority of the case series were males (70%) and their median age was 62 (interquartile range, 50-77) years. Their mean BMI was 23.96 ( $\pm 4.47$ ) kg/m<sup>2</sup>. All cases received low-dose sedation by TCI Propofol (<1 mcg/ml using Schneider model) and music via headphone [Figure 1a] to keep them comfortable during the surgery with a target level of sedation score 3 of the observer assessment of alertness sedation scale (OAS/S). The mean duration of surgery was 111 ( $\pm 14.5$ ) minutes. The patients were satisfied with the surgery and perioperative pain control. No complication were reported.

Brachial plexus block is the anaesthetic technique of choice for dialysis vascular access surgery.<sup>[1,2]</sup> It provides excellent anaesthesia and analgesia and avoids the risks of general anaesthesia. The vasodilatory effect not only assists the surgeon intraoperatively but also improves the primary patency rate of the fistulae.<sup>[1,2]</sup> A second-stage BBF transposition surgery<sup>[3]</sup> is a common proximal vascular access surgery in our institution. A large longitudinal incision is made in the medial aspect of the arm which is often extended to the axillary crease [Figure 1d and e]. However, brachial plexus block alone as surgical anaesthesia for such surgery is difficult. Conversion to general anaesthesia for patchy blocks are a common scenario. Patients who managed



**Figure 1:** (a) Patients received low dose sedation target controlled infusion (TCI) Propofol (<1  $\mu$ g/ml using Schneider model) and music via headphone to keep them comfortable during the surgery with target level of sedation score 3 by observer assessment of alertness sedation scale (OAS/S); (b) Ultrasound guided supraclavicular brachial plexus block, 20 ml ropivacaine 0.5%; (c) Ultrasound guided Pecs II block, 20 ml ropivacaine 0.25%; (d and e) Brachiobasilic fistula (BBF) transposition surgery – a large longitudinal incision is usually made in the medial aspect of arm which often extends to the axillary crease

to undergo surgery with brachial plexus block alone usually required substantial amount of LA supplements by surgeon and intravenous sedation analgesia. The surgical incision area which is the medial aspect of the arm is innervated by the intercostobrachial nerve (ICBN), a branch of the second intercostal nerve (T2) and the medial brachial cutaneous nerve (MBCN), a branch of the medial cord of the brachial plexus. ICBN is not part of the brachial plexus and it innervates the upper half of the medial aspect of the arm and axilla region. Therefore, supraclavicular brachial plexus block does not cover ICBN.

Several authors<sup>[4,5]</sup> demonstrated that using a supplemental PECS II block will provide the analgesic coverage for the axilla and medial aspect of upper arm. We understand that PECS II block is an interfascial plane block commonly used as regional block for breast surgery.<sup>[6]</sup> The LA delivered in the fascial plane will also block the ICBN which runs its course along the thoracic wall before entering the medial wall of the axilla.<sup>[7]</sup> A randomised placebo-controlled trial of proximal arm vascular access surgery by Quek *et al.*<sup>[5]</sup>

demonstrated that only one third in the intervention group required LA infiltration by surgeon compared to 100% in the placebo group. The intervention group received ultrasound-guided combined supraclavicular brachial plexus block (20 ml ropivacaine 0.5%) and PECS II block (10 ml ropivacaine 0.5%) while the placebo group only received ultrasound-guided supraclavicular brachial plexus block. We modified their methodology<sup>[5]</sup> by altering the LA concentration and volume for PECS II block. A 20-ml ropivacaine 0.25% was delivered beneath pectoralis minor at the 2<sup>nd</sup> and 3<sup>rd</sup> rib level instead [Figure 1c]. As for the supraclavicular brachial plexus block, 20-ml ropivacaine 0.5% was deposited mainly at the lower and middle trunk component of the brachial plexus and lesser LA was deposited at the superior trunk [Figure 1b]. We can identify the probable location of the brachial plexus trunks and their components by tracing them using an ultrasound scan from the supraclavicular level to the interscalene groove-root level. LA was mainly deposited at the lower and middle trunks to block the MBCN which is a branch of medial cord with tributaries from the lower and middle trunks. As for the PECS II block, the success of blocking the ICBN is greatly enhanced by increasing the LA volume. To keep the LA dose within the safe limit, we halved the strength of the LA concentration for PECS II block.

Following the case series, we have been using ultrasound-guided combined supraclavicular brachial plexus and PECS II block with the above recommended LA regime for proximal vascular access surgery in those cases feasible for regional block.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

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#### REFERENCES

1. Ismail A, Abushouk AI, Bekhet AH, Abunar O, Hassan O, Khamis AA, *et al.* Regional versus local anesthesia for arteriovenous fistula creation in end-stage renal disease: Systematic review and meta-analysis. *J Vasc Access* 2017;18:177-84.
2. Palaniappan S, Subbiah V, Gopalan VR, Kumar PV, Vinothan RJ. Observational study of the efficacy of supraclavicular brachial plexus block for arteriovenous fistula creation. *Indian J Anaesth* 2018;62:616-20.
3. Kakkos SK, Haddad GK, Weaver MR, Haddad RK, Scully MM. Basilic vein transposition: What is the optimal technique? *Eur J Vasc Endovasc Surg* 2010;39:612-9.
4. Purcell N, Wu D. Novel use of the PECS II block for upper limb fistula surgery. *Anaesthesia* 2014;69:1294.
5. Quek KH, Low EY, Tan YR, Ong ASC, Tang TY, Kam JW, *et al.* Adding a PECS II block for proximal arm arteriovenous access-a randomised study. *Acta Anaesthesiol Scand* 2018;62:677-86.
6. Wahal C, Kumar A, Pyati S. Advances in regional anaesthesia: A review of current practice, newer techniques and outcomes. *Indian J Anaesth* 2018;62:94-102.
7. Nair AS. Cutaneous innervations encountered during mastectomy: A perplexing circuitry. *Indian J Anaesth* 2017;61:1026-7.

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