Usefulness of supplemental parasternal block for sternal keloid excision under general anesthesia in a child status post multiple cardiac surgeries

Sunil Rajan, Bhoomolla Spandana, Reshma Rajkumar, Jerry Paul

Department of Anaesthesiology, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Kochi, India

Correspondence to Sunil Rajan, Department of Anaesthesiology, Amrita Institute of Medical Sciences, Kochi, Kerala, India. Tel: 914842856162, fax: 914842802020; e-mail: sunilrajan@aims.amrita.edu

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Sir

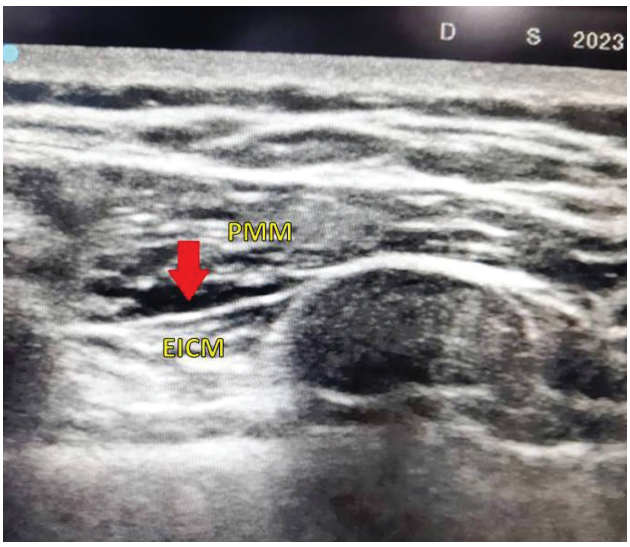
A 12-year-old boy weighing 60 kg, with history of tricuspid atresia, had undergone right modified Blalock–Thomas–Taussig shunt, and patent ductus arteriosus ligation on day 1 of life. One year later he underwent bidirectional Glenn shunt, and extra cardiac Fontan surgery was done at 6 years. He presented now with a thick keloid in the midline sternotomy scar for keloid excision.

Current screening echo showed tricuspid atresia, normally related great arteries with normal ventricular flow and unobstructed Glenn and Fontan flow profiles. Intravenous midazolam 1 mg, fentanyl 100 mcg and ketamin 60 mg were given and incremental bolus of propofol 10 mg (total 20 mg) was given till loss of response to verbal commands and relaxation of jaw. Airway was then secured with size 3 proseal laryngeal mask airway (PLMA) and correct placement was ensured with regular endtidal carbon dioxide (ETCO2) waveforms.

Parasternal block was then given under ultrasound guidance at third and fifth intercostal spaces 2 cm lateral to midline bilaterally. Spread of injected solution causing separation of pectoralis major muscle from the rib and external intercostal muscle confirmed deposition of drug in the correct plane (Fig. 1). Ten milliliter of 0.25% bupivacaine was injected at each site.

Anesthesia was maintained with sevoflurane (1.5–2%) in air oxygen mixture under spontaneous ventilation. Intraoperatively patient remained stable with heart rate 86-98/min, systolic blood pressure 90–100 mmHg, oxygen saturation 96–98% and ETCO2 32-40 mmHg and had received 500 ml of Ringer lactate. At the end of surgery, which lasted for 2 h, PLMA was removed when patient was awake. He had good postoperative analgesia.

Figure 1



Superficial parasternal-intercostal plane block.

Anesthetic goals in a child post-Fontan surgery include adequate hydration, avoidance of hypoxia, hypercabia,

and acidosis and preservation of spontaneous ventilation whenever possible. If general anesthesia is mandated, low inspiratory pressures and minimal positive end expiratory pressures are to be used [1,2]. Sternotomy produces considerable pain which increases with chest wall movement and reduces pulmonary function with higher risk of development of postoperative hypoxia, atelectasis, and pneumonia [3].

Parasternal block is commonly advocated to provide supplemental anaesthesia intraoperatively and for postoperative analgesia following median sternotomy, breast surgery and cardioverter-defibrillator implantation [4,5]. The nerve targeted is the anterior branches of intercostal nerves which enters intercostal and pectoralis major muscles and innervates the antero-medial region of chest wall. Local anesthetic is injected deep to pectoralis major muscle and superficial to intercostal muscles or between internal thoracic muscle and transverses thoracis muscle. Therefore, these blocks are essentially described as superficial or deep parasternal-intercostal plane blocks, depending on where the target nerves are blocked. The anatomical injection site differentiates these techniques though both techniques provide analgesia to the antero-medial chest wall [5].

Supplemental regional block helps to reduce dose requirement of anesthetic agents intraoperatively. Use of supplemental parasternal block enabled us to keep the child spontaneously breathing under general anaesthesia using PLMA with use of lesser doses of anesthetic agents, thereby minimising drug adverse effects which could be deleterious in the presence of cardiac diseases. It is concluded that supplemental parasternal block provides good intraoperative and postoperative analgesia following anterior midline chest wall surgeries.

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Conflicts of interest
There are no conflicts of interest.

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