Successful Use of Single-Shot Pectointercostal Fascial Block for Awake Sternal Wound Revision

To the Editor,

The Pectointercostal fascial block (PIFB) is a newer regional technique that can provide analgesia to the medial anterior chest by blocking the anterior branches of the intercostal nerves at T2-T6 dermatomes. Originally described by de la Torre[1] in patients undergoing breast surgery, PIFB has been recently described by Kumar et colleagues[2] as an effective technique to reduce postoperative pain after sternotomy.

Unfortunately, as the authors themselves explained in the manuscript, this technique requires multiple injections (three on each side) with the risk of pneumothorax due to the proximity of the pleura.

In order to reduce the risk of complications, we tested in an American Society of Anesthesiologist (ASA) score 3 patient undergoing sternal wound revision while awake [Figure 1a] and providing written consent to data collection and publication, a variation of PIFB using a single injection on each side in the middle third of the sternum.

Twenty minutes before the surgical incision, with the patient in the supine position, a linear ultrasound probe was positioned in the parasternal region. A 22-gauge, 50 mm sonoplex Stim needle (Pajunk Medical System, Tucker GA) was advanced via an in-plane approach from the cranial to caudal direction until it reached the interfascial plane between the Pectoralis Major muscle and External Intercostal muscle, at the level of the fourth rib. After the position of the needle tip was confirmed, 20 ml of 0.5% ropivacaine was administered; the same procedure was performed on the other side [Figure 1b]. Conscious sedation was achieved with an intravenous bolus of Midazolam 2 mg, and supplemental oxygen with nasal cannulas at a flow rate of 3l/min was provided during the entire procedure.

The patient reported no pain during the surgery, and no additional local anesthetics were required after the block.

New fascial plane blocks, such as PIFB and Transversus Thoracic Plane Block (TTPB), have shown to be effective in providing analgesia of the area along the sternum blocking the anterior branches of the intercostal nerves at T2-T6 dermatomes. The PIFB, being more superficial, appears to be associated with fewer risks compared with TTPB due to the fact that Transversus Thoracic Muscle is difficult to

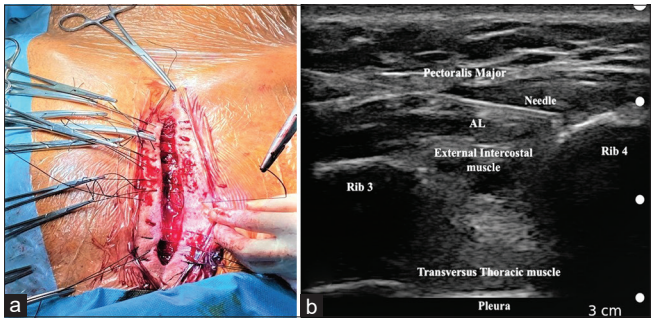

Figure 1: (a) View of the surgical field during sternal wound revision. (b) Sono-anatomy of Pectointercostal fascial block (PIFB). Injection of local anesthetic (LA) in the fascia between Pectoralis Major muscle and External Intercostal muscle, above the fourth rib

visualize because it is located close to the pleura resulting in a greater risk of pneumothorax.[3]

This would be even more true if it was possible to maintain the effectiveness of the technique by reducing the number of injections needed. In fact, a cadaver study showed that 15 ml of local anesthetic diffuses from the first to the sixth intercostal space,[4] covering the T2-T6 dermatomes.

This is exactly what seems to happen in our case, where a low concentration/high volume local anesthetic solution injected into the central third of the sternum, spreading cranially and dorsally, was found to be sufficient to guarantee anesthesia and analgesia to the entire sternum.

In our case, we used 0.5% ropivacaine in order to obtain an anesthetic block but, if the goal is to obtain simple analgesia for the sternotomy, we believe it is possible to reduce the concentration in order to reduce the risk of systemic toxicity from local anesthesia (LAST).

Although further studies are obviously needed to confirm this preliminary observation, we believe that the single-shot PIFB technique may be equally effective in relieving postoperative pain in patients undergoing cardiac surgery performed via a medium sternotomy while reducing the risk of complications related to the block such as pneumothorax and LAST.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Antonio Toscano[1], Paolo Capuano[2], Mauro Rinaldi[2,3], Luca Brazzi[1,2]

[1]Department of Anesthesia, Critical Care and Emergency, 'Città della Salute e della Scienza' Hospital, Turin, [2]Department of Surgical Sciences, University of Turin, Turin, [3]Department of Cardiovascular and Thoracic Surgery, 'Città della Salute e della Scienza' Hospital, Turin, Italy

Address for correspondence: Dr. Antonio Toscano, Department of Anesthesia, Critical Care and Emergency, 'Città della Salute e della Scienza' Hospital, Corso Bramante 81, cap 10126, Torino, Turin, Italy.
E-mail: antoniotoscano@me.com

Submitted: 06-Sep-2021
Accepted: 27-Jan-2022 **Published:** 05-Jul-2022

REFERENCES

1. de la Torre PA, García PD, Alvarez SL, Miguel FJ, Pérez MF. A novel ultrasound-guided block: A promising alternative for breast analgesia. Aesthet Surg J 2014;34:198-200.
2. Kumar AK, Chauhan S, Bhoi D, Kaushal B. Pectointercostal fascial block (PIFB) as a novel technique for postoperative pain management in patients undergoing cardiac surgery. J Cardiothorac Vasc Anesth 2021;35:116-22.
3. Ohgoshi Y, Ino K, Matsukawa M. Ultrasound-guided parasternal intercostal nerve block. J Anesth 2016;30:916.
4. Fujii S, Vissa D, Ganapathy S, Johnson M, Zhou J. Transversus thoracic muscle plane block on a cadaver with history of coronary artery bypass grafting. Reg Anesth Pain Med 2017;42:535-7.

Access this article online

Quick Response Code:

Website: www.annals.in

DOI: 10.4103/aca.aca_120_21

How to cite this article: Toscano A, Capuano P, Rinaldi M, Brazzi L. Successful use of single-shot pectointercostal fascial block for awake sternal wound revision. Ann Card Anaesth 2022;25:377-8.