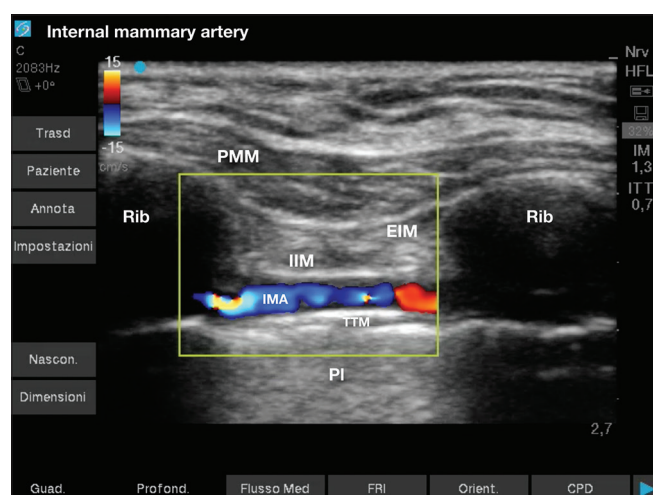


## The correct internal mammary artery anatomy: A topic for ultrasound parasternal block

Dear Prof. (Dr.) Abdelazeem Ali Eldawlatly

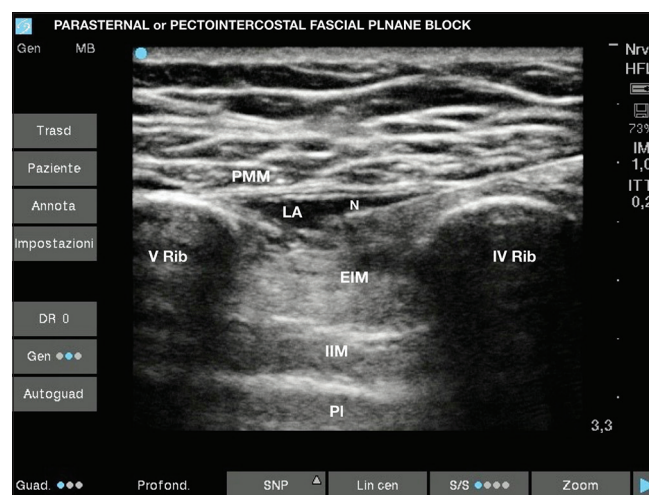
Editor-in-Chief of Saudi Journal of Anesthesia

We read with great interest the article by Sandeep Diwan *et al.* titled “Ultrasound-guided bilateral parasternal block: A boon for managing pain after sternal fracture/dislocation.” We congratulate them on their excellent management of three patients with manubrium sternal dislocation for whom the authors administered continuous bilateral parasternal blocks. However, we noticed some anatomical inaccuracies that we would like to describe below. The authors state that internal mammary artery (IMA) runs between pectoralis major muscle (PMM) and the external intercostal muscles (EIM). IMA arises from the subclavian artery; close to the phrenic nerve, it goes down into the thorax. It descends vertically about 1 cm lateral to the sternal border, behind the first six costal cartilages. IMA is separated from the pleura (PI) by the endothoracic fascia and inferiorly by the transversus thoracis muscle (TTM). It is accompanied by two mammary veins, medially and laterally, respectively. The IMA runs between internal intercostal muscle (IIM) and TTM. Moreover, in Figure 1, the authors incorrectly represent TTM lying above IMA. TTM is a thin and hypoechoic muscular layer close to the pleura on the inner surface of the anterior thoracic wall.<sup>[1]</sup> It runs between PI and IIM. The TTM and IMA sonoanatomy should be described as follows: from inferior



**Figure 1: Ultrasound internal mammary artery landmarks.** The internal mammary artery runs between internal intercostal and transversus thoracis muscles. PMM: Pectoralis major muscle; IIM: internal intercostal muscle; EIM: external intercostal muscle; TTM: transversus thoracis muscle; IMA: internal mammary artery; PI: pleura; Rib: rib

to superior, we find PI, TTM, IMA, IIM, EIM, PMM [Figure 1]. This sonoanatomical description is a very important topic in order to perform both ultrasound parasternal block (US-PSB) or pectointercostal plane block and a rightly transversus thoracis plane block (TTP). Both the techniques provide effective analgesia for breast and cardiac surgeries, cardiac device implantation, and acute and chronic sternal pain management such as sternal fractures and sternotomy.<sup>[2-4]</sup> We also believe that a more detailed description of continuous US-PSB may be useful to anesthesiologist who want to perform this technique for the management after sternal fractures/dislocation. It could be very interesting to know in which intercostal space was the injection performed and the catheter inserted. In our practice, US-PSB is performed in a supine position. Via an in-plane approach, a linear probe is placed on the chest in a parasagittal plane lateral to the sternum in order to visualize PMM, EIM, IIM, ribs, and PI. Through an atraumatic 100-mm needle, US-PSB is performed in a cranial-to-cephalad direction by two separate injections of local anesthetic at level of the second and fourth intercostal space into the interfascial plane between PMM and EIM.<sup>[5]</sup> [Figure 2]. It would be also interesting to know which was the exact “point of needle entrance lateral to internal mammary vessels.” May be the authors chose to be lateral to avoid an injury to the vessels they state running in the same interfascial plane in which they positioned the catheter.



**Figure 2: Ultrasound parasternal or pectointercostal fascial plane blocks.** US-PSB is performed bilaterally by two separate injections of local anesthetic at level of the second and fourth intercostal space into the interfascial plane between major pectoralis and intercostal muscles. PMM: Pectoralis major muscle; IIM: intercostal muscle; EIM: external intercostal muscle; TTM: transversus thoracis muscle; LA: local anesthetic; N: needle; PI: pleura; Rib: rib

Moreover, the IMA lies in a deeper fascial plane compared to the one in which they correctly performed US-PSB. TTP and US-PSB are both proven as safe and reliable techniques for chest surgery and have good safety profiles. Further studies are warranted to validate our speculations.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**GIUSEPPE SEPOLVERE<sup>1</sup>,  
FABRIZIO DI ZAZZO<sup>1</sup>, LUIGI MEROLA<sup>1</sup>,  
MARIO TEDESCO<sup>2</sup>, LOREDANA CRISTIANO<sup>1</sup>**

<sup>1</sup>Department of Anesthesia and Cardiac Surgery Intensive Care Unit, San Michele Hospital, Maddaloni, Caserta, <sup>2</sup>Department of Anesthesia and Intensive Care Unit and Pain Therapy, Mater Dei Hospital, Bari, Italy

**Address for correspondence:**

Dr. Giuseppe Sepolvere,  
Anesthesiologist in Chief, Department of Anesthesia and Cardiac Surgery Intensive Care Unit, San Michele Hospital, Via Montella No. 4, 81024, Maddaloni - Caserta, Italy.  
E-mail: gsepolvere@inwind.it; Notisde@gmail.com

**Submitted:** 11-Oct-2020, **Accepted:** 12-Oct-2020,  
**Published:** 01-Apr-2021

**References**

1. November 2019 issue of ASRA News. Available from: <https://www.asra.com/asra-news/article/214/transversus-thoracic-plane-block-how-i-d>.


2. Fujii S, Roche M, Jones PM, Vissa D, Bainbridge D, Zhou JR. Transversus thoracic muscle plane block in cardiac surgery: A pilot feasibility study. *Reg Anesth Pain Med* 2019;44:556-60.

3. Thomas KP, Sainudeen S, Jose S, Nadhari MY, Macaire PB. Ultrasound-guided parasternal block allows optimal pain relief and ventilation improvement after a sternal fracture. *Pain Ther* 2016;5:115-22.

4. Sepolvere G, Fusco P, Tedesco M, Scimia P. Bilateral ultrasound-guided parasternal block for postoperative analgesia in cardiac surgery: Could it be the safest strategy? *Reg Anesth Pain Med* 2020;45:316-7.

5. Cibelli M, Brodier EA, Smith FG. Pectoralis-intercostal-rectus sheath (PIRS) plane block with catheters. A new technique to provide analgesia in cardiac surgery. *J Cardiothorac Vasc Anesth* 2020;34:846-7.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
<b>Website:</b> www.saudija.org	<b>Quick Response Code</b> 
<b>DOI:</b> 10.4103/sja.sja_1028_20	

**How to cite this article:** Sepolvere G, Di Zazzo F, Merola L, Tedesco M, Cristiano L. The correct internal mammary artery anatomy: A topic for ultrasound parasternal block. *Saudi J Anaesth* 2021;15:233-4.

© 2021 Saudi Journal of Anesthesia | Published by Wolters Kluwer - Medknow