

# The Effect of Rhomboid Intercostal Plane Block in Minimal Invasive Cardiac Surgery

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## Dear Editor,

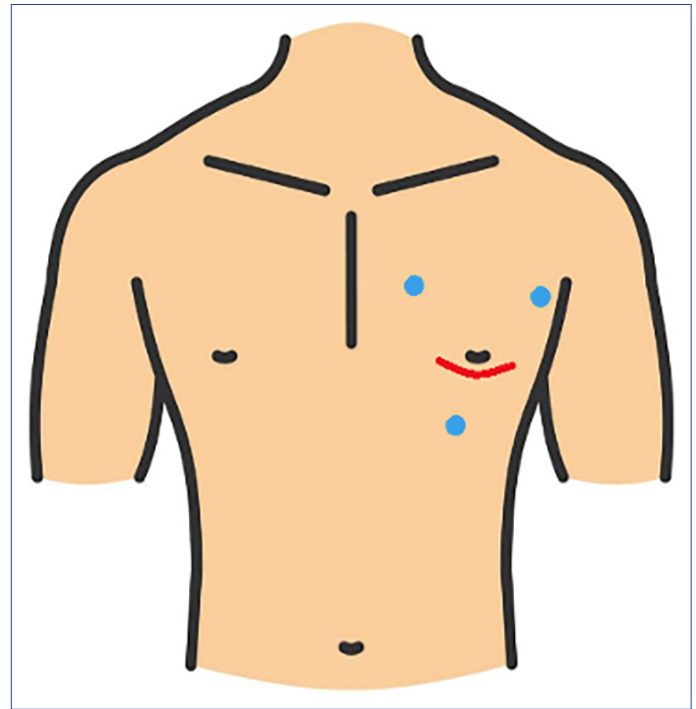
Minimally invasive cardiac surgery (MICS) has emerged as a viable alternative to traditional open-heart surgery, offering benefits such as reduced surgical trauma, shorter hospital stays, and faster recovery times.<sup>[1]</sup> However, despite these advantages, postoperative pain management remains a significant challenge in MICS. Since severe pain may be experienced due to the involvement of the intercostal nerves and rib retraction during MICS, effective pain control is crucial not only for patient comfort but also for promoting early mobilization, reducing the risk of complications, and enhancing overall recovery. Various analgesic techniques have been explored to address postoperative pain, including the serratus anterior plane block, erector spinae plane block, transverse thoracic muscle plane block, and pecto-intercostal fascial plane block.<sup>[2-4]</sup> Despite these options, finding the optimal approach continues to be an area of active investigation.

First described by Elsharkawy et al.<sup>[5]</sup> in 2016, the rhomboid intercostal plane (RIP) block is a relatively novel regional anesthesia technique that involves injecting local anesthetic between the rhomboid major and intercostal muscles, providing effective analgesia from the T2 to T9 dermatomes.<sup>[6]</sup> This technique offers the advantage of an injection site away from the surgical field, thus avoiding interference with surgical dissection. The entry sites of trocars in minimally invasive cardiac surgery are shown in Figure 1.

Furthermore, the RIP block is simple to perform, minimally invasive, and has the potential to reduce reliance on

systemic opioids. Here, we share our experience with the RIP block in a patient who underwent minimally invasive cardiac surgery, focusing on its efficacy in managing postoperative pain.

The patient was a 60-year-old man who underwent minimally invasive coronary artery bypass graft surgery, with a left internal mammary artery to right coronary



**Figure 1.** Trocar entry points are marked in blue. The area shown in red indicates the incision line.

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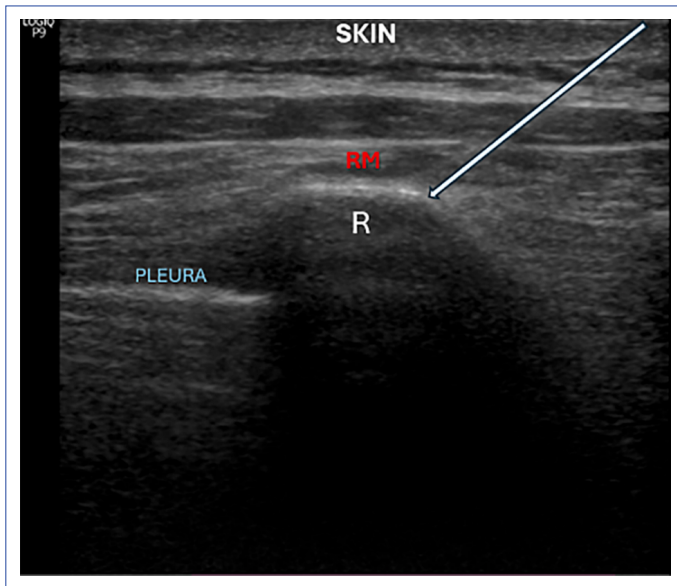
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**Figure 2.** Arrow: Needle.

R: Rib; RM: Rhomboid muscle.

artery graft. He was prepared in the preoperative holding area with standard monitoring, including electrocardiography, pulse oximetry, and non-invasive blood pressure measurements. Premedication consisted of 2 mg intravenous midazolam to alleviate anxiety before surgery. The patient was then transferred to the operating room. To manage postoperative pain, a RIP block was administered before the induction of general anesthesia. The ultrasound-guided RIP-type block is shown in Figure 2.

With the patient in a prone position, the block was performed using ultrasound guidance (GE, LOGIQ P9 R3, Seongnam-si, Republic of Korea). A linear probe was used to visualize the anatomical structures, and a 22-gauge needle was inserted to deliver 30 ml of 0.25% bupivacaine between the rhomboid major and intercostal muscles, ensuring proper spread of the anesthetic.

Following the block, general anesthesia was induced with 1 mg·kg<sup>-1</sup> propofol, 2 µg·kg<sup>-1</sup> fentanyl, and 0.8 mg·kg<sup>-1</sup> rocuronium. Anesthesia was maintained with a combination of remifentanyl infusion and sevoflurane.

Postoperatively, we initiated patient-controlled analgesia (PCA) with fentanyl. The PCA was set with no continuous infusion, a bolus dose of 10 mcg, and a lockout interval of 7 minutes. The patient was extubated three hours after the surgery in the cardiovascular intensive care unit. Over the next 24 hours, we monitored and recorded the patient's visual analogue pain scores, opioid consumption, and opioid-related complications to assess the efficacy of the pain management strategy.

The duration of the surgery was 270 minutes. During the procedure, the mean heart rate was 56.8 beats per

**Table 1.** Visual analog scale scores and cumulative fentanyl consumption after extubation

Time point	VAS score	Cumulative fentanyl consumption
Cardiovascular ICU	0	10 mcg
1 hour	0	30 mcg
6 hours	1	60 mcg
12 hours	0	60 mcg
24 hours	1	140 mcg

VAS: Visual analog scale; ICU: Intensive care unit

minute, and the mean of the mean arterial pressure was 54.6 mmHg. The RIP block demonstrated excellent efficacy in managing postoperative pain. The patient's visual analogue scale scores remained consistently low, and cumulative fentanyl consumption through patient-controlled analgesia was minimal (Table 1). No complications were observed during the postoperative period, indicating that the RIP block was both safe and effective in this case.

In conclusion, our experience with the rhomboid intercostal plane block in a patient undergoing minimally invasive coronary artery bypass graft surgery highlights its effectiveness as a component of multimodal analgesia. Future studies with larger patient populations are warranted to further validate these findings and establish the RIP block as a standard practice in postoperative pain management for such procedures.

#### Disclosures

**Conflict of Interest:** All authors declared no conflict of interest.

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