

LETTERS TO THE EDITOR

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Awake revision sternal and wound debridement surgery with novel recto-intercostal fascial plane block and pecto-intercostal fascial plane block combination

Revision sternal surgery is performed after open heart surgery due to the hypersensitive reaction to sternum wires, infection of the wires, and patient discomfort.¹ Deep sternal wound infection around the wires may occur after cardiac surgery in a few weeks, and if the infection is not treated, the patient's general condition may deteriorate and it may cause sepsis. Treatment of infection of sternal wires is surgical removal of the wires and wound debridement. This surgery is called sternal revision.¹ Performing awake surgery may be beneficial due to the current medical condition and co-morbidities of the patients and recent cardiac surgery.² The intra-operative anesthesia management of awake cardiac surgery is important for a comfortable surgery and for the patient to avoid pain. Regional anesthesia is performed for intraoperative anesthesia management. For sternal surgeries, parasternal intercostal plane blocks are used.² Pecto-intercostal fascial plane block (PIFPB) is a parasternal block, and it is performed between the pectoralis major muscle (PMm) and the 3rd/4th ribs. Parasternal blocks target the anterior cutaneous branches of T2-T6 thoracic nerves.²⁻⁴ They cannot cover T7 and lower branches of thoracic nerves and cannot provide sensorial blockade at these levels. However, during sternal surgery, the incision line extends throughout the sternum to the epigastric area. In patients where revision sternal is required and if awake surgery is needed, parasternal blocks are not sufficient alone. Recently, Tulgar *et al.* have described a novel block named "recto-intercostal fascial plane block" (RIFPB).³ RIFPB is performed between the rectus abdominis muscle (RAM) and costal cartilages of ribs 6-7 (insertion of RAM). In their cadaveric examination, they reported that the dye spread extensively to the anterior branches of the T6-T9 thoracic nerves, and laterally to the entire lower thorax. The RIFPB may be used as a complementary regional anesthetic method with PIFPB for sternal surgeries. Therefore, we performed a PIFPB+RIFPB combination on our high-

risky patient who underwent awake revision sternal and wound debridement surgery.

Written informed consent was obtained from the patient for this report. A 73-year-old male patient underwent coronary artery bypass grafting, mitral replacement, and tricuspid repair three weeks ago in our clinic. The patient presented with deep sternal wound infection, infection of the sternal wires, and discomfort. We planned an awake operation under regional anesthesia due to his co-morbidities and recent cardiac surgery. Following conscious sedation (midazolam and fentanyl) and monitoring, we performed a PIFPB+RIFPB combination. We used a high-frequency linear probe and an 80 mm needle for the blocks. Under sterile conditions, the probe was placed in a parasagittal orientation near the lateral aspect of the sternum at the level of the 3rd and 4th ribs for PIFPB. The PMm, ribs, intercostal muscles, and pleura were visualized. The needle was inserted with an in-plane technique between the PMm and intercostal muscle. Hydrodissection was performed with 5 mL saline for confirmation. After, 20 mL of 0.5% bupivacaine was administered bilaterally (a total of 40 mL). For RIFPB, the probe was placed 2-3 cm lateral and caudal to the xiphoid in the epigastric area. The RAM and its insertion, 6th and 7th cartilage ribs, were visualized. The needle was inserted between RAM and rib with an in-plane technique in a caudo-cranial way. Hydrodissection was performed with 5 mL saline for confirmation. After, 15 mL of 0.5% bupivacaine was administered bilaterally (a total of 30 mL). We evaluated the sensorial blockade with a cold test 20 min after the block was performed. There was a dermatomal coverage from T2 to T10 dermatome level. We performed 2 mg of midazolam for sedation at the beginning of the surgery. The incision line was from the incisura jugularis to the xiphoid process. There were seven sternal wires. Deep sternal wound debridement, removal of the wires, and sternum revision surgeries were performed. New wires were not positioned. There was no need for additional sedation or analgesic drugs during the surgery and no pain on the pleural side of the sternum. The surgery lasted for 90 minutes, there were no complications, and the patient's hemodynamics were stable. The patient was transferred to the intensive care unit after surgery. The postoperative period was stable and the patient was discharged from the hospital after 24 hours from the surgery.

Deep sternal wound infection is an uncommon potentially severe complication following median sternotomy. It significantly impacts healthcare outcomes, leading to decreased long-term survival rates, prolonged hospital stays, and increased treatment costs. Surgical site infections can arise from various sources, including

direct contamination of the wound, and extension from nearby structures. When sternal wound infection is suspected, it is crucial to promptly collect blood and tissue samples for culture and initiate intravenous administration of broad-spectrum antibiotics targeting the likely causative microorganisms. Subsequent adjustments to antimicrobial therapy should be based on the results of microbiological cultures and antibiotic susceptibility testing. However, there is variability in the data regarding the optimal antibiotic regimen and duration of treatment. The use of prophylactic antibiotics in cardiothoracic surgery is important in the prevention of sternal wound infections. However, surgical debridement to remove necrotic tissue is required for source control in the treatment of sternal wound infection.⁵ In these patients requiring wound debridement, awake surgery is often performed due to their existing comorbidities.

Dost *et al.* performed the same combination in a patient who underwent awake subxiphoid pericardial window surgery.² Our surgery type was revision sternal and deep wound debridement. The incision line was longer and the surgery type was more invasive than the case of Dost *et al.* In our clinic, we always perform PIFPB with single injection. We verify the spread along the parasternal region under ultrasound guidance in the cranio-caudal direction. In such patients, attention should be paid to the high doses of local anesthetic given to the patient. In our patient, we performed a total of 70 mL local anesthetic and there was no complication. According to our observations and experiences in the current case, the PIFPB+RIFPB combination may be effectively and safely used in such high-risk patients who underwent awake sternal surgery.

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Conflicts of interest

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Authors' contributions

All of the authors made substantial contributions to the conception and design, or acquisition of data, or analysis and interpretation of data; they have been involved in drafting the manuscript or revising it critically for important intellectual content. All authors read and approved the final version of the manuscript.

History

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Under the fascia: a new ultrasound guided fascial plane block. The deep rectus sheath block

Postoperative pain is the most frequent cause of pain. Acute postoperative pain is characterized by the combination of unpleasant sensory, emotional and mental experiences precipitated by surgical trauma and associated with autonomic, endocrine-metabolic, physiological and behavioral responses.¹ Patients undergoing major abdominal surgery have large incisions, causing severe acute postoperative pain that, if left untreated, is associated with a higher incidence of postoperative morbidity and delayed recovery.² The postoperative pain control in these cases represent a difficult challenge, which is addressed with multimodal analgesia based on the use of the regional anesthesia techniques, opioids, and non-steroidal anti-inflammatory drugs. Thoracic epidural analgesia remains the cornerstone of