



The ideal regional block after video-assisted thoracoscopic surgery: do we have it?

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In the journal *Ann Thorac Surg*, Wu *et al.* presented the results of a randomized controlled trial in which they tested the hypothesis that a modified paravertebral block (PVB) technique would offer advantages over patient-controlled thoracic epidural analgesia (TEA) in the postoperative pain management of patients undergoing video-assisted thoracic surgery (1). It is worth considering that Wu's work represents a natural evolution of a previous report in which a modified PVB technique was compared to intravenous patient-controlled analgesia (IVPCA) in a patient population undergoing video-assisted thoracic surgery (2). In that study, the modified PVB technique was superior to IVPCA for systemic analgesic consumption, patient satisfaction, and postoperative well-being (2).

Approximately two of every ten patients who undergo minimally invasive thoracic surgery or video-assisted thoracoscopic surgery (VATS) suffer moderate-severe acute postoperative pain (3). Poorly managed acute postoperative pain after minimally invasive surgery decreases the quality of recovery and is associated with postsurgical complications, including chronic postsurgical pain (4). Given the negative side effect profile of large dosages of systemic opioids, there has been a significant amount of interest in regional anesthetic adjuncts to mitigate some of the postoperative pain associated with thoracic surgery. Epidural analgesia has been considered the standard of care for thoracic surgery,

particularly open thoracotomies. However, many regional options could potentially benefit patients having those procedures, including thoracic epidural or PVBs, and there is no delineated superior choice (5). This has motivated anesthesiologists to search for newer regional analgesia techniques (6).

In the current work by Wu and colleagues, 176 adult patients were equally allocated to receive a modified PVB or TEA. The study's key findings are that postoperative pain intensity, quality of life, patient satisfaction, and systemic analgesic use were neither clinically nor statistically different between study arms (1). Nonetheless, block failures, hypotension, and urinary retention rates were substantially more frequent in the TEA arm (1). Although these findings are not new and align with pooled and summarized data from previous studies (5), one could argue that Wu's work adds to the growing sentiment of abandoning TEA for patients undergoing VATS as recommended by the PROSPECT guidelines (6). Also, other regional analgesia techniques, such as posterior intercostal blocks, have demonstrated similar results to those reported here, suggesting that TEA for managing minimally invasive, post-thoracoscopy pain is controversial (5).

It is worth mentioning that Wu's work has limitations. First, the generalizability of the modified PVB technique can be seen as a significant concern. The study was

conducted in one center in a Chinese population of patients. Whether the results can be extrapolated to other patients with different access to healthcare, socioeconomic and ethnic backgrounds, and postoperative pain management expectations remains unknown. Second, while the authors previously reported using a modified PVB in which surgeons placed a catheter in the paravertebral space under thoracoscopic visualization, no studies suggest the reproducibility of the technique (2). And third, the lack of concealment and blinding in the study design increases the risk of selection, detection, and performance bias (7).

Additionally, it is important to reiterate that while the modified PVB technique described by Wu *et al.* offered statistically similar analgesia to TEA after VATS with a lower failure rate, less placement time, less hypotension, and fewer incidences of urinary retention, these results should not be extrapolated to open thoracotomy or non-thoracic procedures. Open thoracotomy can cover multiple intercostal spaces, which may require the placement of multiple paravertebral catheters. In procedures where a chest tube is not placed, the risk of pneumothorax with PVB needs to be weighed against the risks associated with TEA, as described by Wu *et al.* In non-thoracic procedures, the modified technique described by Wu *et al.* is not possible, as it requires PVB catheter placement under thoracoscopic visualization. The modified PVB technique described in this article, which is performed by the surgeon, is not equivalent to the traditional PVB performed by anesthesiologists.

In conclusion, the results from Wu *et al.* add further evidence on the effective use of non-neuraxial regional anesthesia techniques in managing acute postoperative pain after minimally invasive thoracic surgery. We encourage anesthesiologists and thoracic surgeons to consider conducting more robust randomized controlled trials investigating the effects of the modified PVB versus conventional PVB or other regional analgesia techniques on postoperative pain management and quality of recovery in patients undergoing thoracoscopic procedures in order to elucidate which patient populations derive the most benefit from these unique techniques.

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