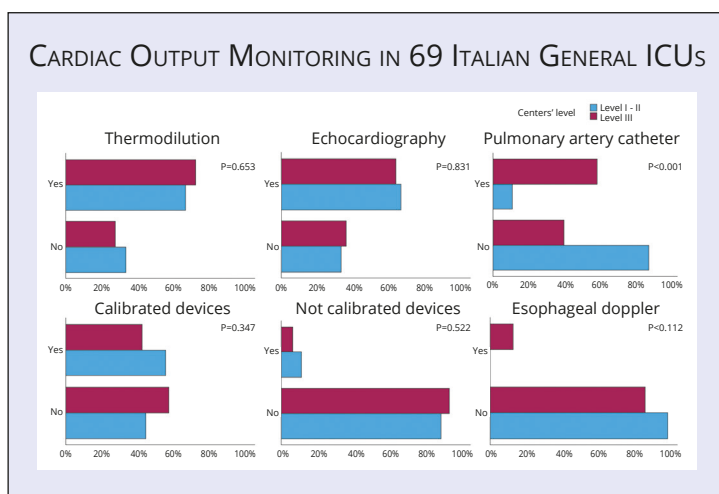


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## EDITORIAL

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# Thoracic wall block for minimally invasive thoracic surgery: enough analgesic advantages to improve functional outcomes?

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Although the introduction of minimal invasive surgery has significantly reduced surgical stress, a proportion of patients might still experience significant pain after video/robotic-assisted thoracoscopic surgery (VATs, RATs).<sup>1</sup> Pain can be caused by surgical site incisions, nerve injuries and/or by the chest tube. As in all other surgical branches, the demand for enhancing patient comfort and improving postoperative outcomes continues to drive innovation aimed at controlling postoperative pain.

Recently, thoracic wall blocks have emerged as a valuable addition to traditional analgesic strategies.<sup>2</sup> These regional anesthesia techniques involve the targeted administration of local anesthetics around nerves supplying the thoracic wall, and they demonstrated promising results in alleviating severe pain associated with thoracic surgical procedures. Postoperative pain not only compromises patient comfort, but it also contributes to respiratory complications, delays postoperative mobilization and prolongs hospital stay. Furthermore, inadequate pain control can hinder rehabilitation efforts, including respiratory physiotherapy, undermine overall surgical success, and impair surgical recovery. In this context, the implementation of thoracic regional wall blocks might represent valuable analgesic strategies, that might not only signifi-

cantly reduce postoperative pain intensity, but also improve postoperative outcomes. In fact, the utility of thoracic wall blocks might extend beyond immediate postoperative pain management. Emerging evidence suggests that these techniques may offer additional benefits, such as attenuating the systemic inflammatory response to surgery, and reducing the incidence of chronic pain syndromes.<sup>3</sup>

Among the thoracic wall blocks that have gained prominence over time there are the Paravertebral block, the Erector Spinae plane block, the Serratus Anterior plane block, and the Intercostal Nerves block. Clinical trials have evaluated the effectiveness of these techniques, either comparing their analgesic efficacy with systemic opioids, or comparing one technique with others; other studies even compare different local anesthetic type and dosages, or block approaches for the same block.<sup>2, 4</sup> Moreover, perioperative care can differ significantly. This clinical heterogeneity prevents drawing definitive conclusions about the optimal thoracic wall block for patients undergoing VATs/RATs. The choice should be probably personalized, but with the shared goals to reduce systemic opioid consumption, their side-effects, and improve patient comfort. It should take in consideration not only their analgesic benefit, but also their side-effects, their

impact on postoperative recovery, and not ultimately patients' comorbidities.

The work by Zhang *et al.* presented in this issue of *Minerva Anestesiologica*,<sup>5</sup> contributes to this extensive literature by advocating for a modified block, the romboid intercostal and serratus plane block.<sup>6</sup> The authors compared the block with the paravertebral thoracic block in a non-inferiority study. The results of this study demonstrated equivalent analgesic efficacy between the two techniques, but with fewer side effects after the romboid intercostal and serratus plane block. Postoperative complications and length of hospital stay did not differ among the two study groups.

In the last decades, numerous trials have evaluated the analgesic efficacy of new regional anesthesia techniques blocking thoracic nerves with low-doses of local anesthetics, and performed peripherally moving away from the central nervous system and nerve-rich area. The results are encouraging, and confirm the analgesic efficacy of these techniques, with minimal risks of side effects and potential nerve damage.<sup>2,4</sup>

It is worth mentioning, the possibility of performing intraoperative video assisted paravertebral nerve blocks or intercostal nerve blocks by the surgeon. This approach appears to be easy to perform, has less impact on the patient's emotional and physical conditions,<sup>7</sup> and might reduce operating room turnover in clinical setting with limited anesthesia personnel and resources.

Although the analgesic superiority of many thoracic wall blocks has been well established, especially over patients receiving systemic opioids, not many clinical trials have compared different techniques, and only few have investigated their safety and impact on functional recovery. This latter aspect is gaining particular attention in patients undergoing VATs or RATs in the context of an Enhanced Recovery After Surgery (ERAS<sup>®</sup>) program, especially when scheduled for 24-hour stay or day-surgery VATs/RATs.<sup>8,9</sup> In these patients, surgeon-performed intercostal nerve blocks within a multimodal opioid-sparing analgesic protocol, and in the context of an ERAS<sup>®</sup> pathway, have been shown to facilitate 24-h postoperative discharge in about 32% of

the patients, and postoperative day 2-discharge in another 35%.<sup>8</sup> Inadequate analgesia was identified as factor delaying postoperative day-1 discharge.<sup>8</sup> These data suggest that achievement of adequate analgesia can also facilitate surgical recovery, but only when patients can functionally take advantage of these analgesic benefits. In fact, prolong hospitalization (5-6 days) has been observed after minimally invasive lung anatomical resections, despite satisfactory analgesia leading to optimal recovery, in patients treated with a traditional perioperative care.<sup>10</sup> Implementing these techniques with a multidisciplinary evidence-based ERAS<sup>®</sup> pathway might represent the best opportunity to guarantee optimal analgesia, and facilitate functional recovery.

In conclusion, thoracic wall blocks represent a valuable analgesic interventions in the context of a multimodal opioid-sparing perioperative pain management for patients undergoing minimally invasive thoracic surgery. By providing targeted analgesia, reducing opioid requirements and their side-effects, and by improving patient comfort these techniques might also facilitate postoperative early mobilization, improve pulmonary function, and early discharge. Implementation of these regional anesthesia techniques within traditional perioperative pathways provides limited benefits. *Vice versa*, implementation of Enhanced Recovery After Thoracic Surgery (ERATS) pathways without strategies to ensure functional analgesia might not be successful. Future trials should also aim at primarily investigating non-analgesic functional outcomes of regional anesthesia blocks, specifically in the context of ERATS programs.

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#### *Conflicts of interest*

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

#### *Authors' contributions*

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