Editorial

A balancing act—the role of opioid-sparing anesthesia in enhancing recovery after thoracic surgery

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The past two decades have seen thoracic surgery advancing from open thoracotomy to a vast multitude of minimally invasive approaches (1). These includes video-assisted thoracic surgery (VATS) (2), uniportal thoracoscopic surgery (UVATS) (3), non-intubated VATS (NIVATS) (4), robotic-assisted thoracic surgery (RATS) (5), as well as protocol-driven approaches such as enhanced recovery after thoracic surgery (ERATS) (6). These minimally invasive approaches offer significant advantages to the patient in improving quality outcomes and facilitating early recovery (7). Nevertheless, there is still a certain level of pain that accompanies the incisions even though they are small, and the physiological and psychological effects of pain can be experienced both during and after the operation (8), and may occur early or late in the recovery process (9).

A multi-modal pain control strategy is advocated to modulate the various pain stimulation pathways (10). This may include a combination of opioid and non-opioid analgesia, using various approaches such as spinal (11), paravertebral (12), erector spinae, perineural, or along subcutaneous planes (13), via various routes such as oral, intramuscular, intravenous, or applying devices such as patient controlled analgesia (PCA) pump or on-Q reservoir (10). The ideal is to find a combination that will maximize patient comfort, minimize undesirable effects, and facilitate a smooth journey to recovery.

The study by Qiu *et al.* (14) randomised and compared opioid-sparing anesthesia versus opioid-based anesthesia in relation to quality of recovery outcomes at 6, 24, and 48 hours after surgery. Short acting opioid in the form of remifentanil was used in the opioid-sparing group, while longer acting opioid agents were avoided. There were two important differences between the two groups. (I) Sufentanil was not used intraoperatively in the opioid-sparing group, and (II) thoracic paravertebral block was performed after anaesthetic induction in the opioid-sparing group.

The primary outcome was the global score on the Quality of Recovery-15 scale (QoR-15) at 6 hours after surgery. This was found not to be significantly different between the two groups. Of note, patients in both groups were given a Patient-Controlled Analgesia (PCA) pump with sufentanil infusion at 2 mL/hour immediately after surgery. The PCA was stopped only on the second postoperative day or upon discharge. This may potentially mask the differences between the two groups in the postoperative period especially during the first 48 hours after surgery. Specifically, this could potentially be a factor that no observable difference was seen in the primary outcome of QoR-15 at 6 hours after surgery, as both groups had received sufentanil via the PCA infusion.

In terms of secondary outcomes, there was an improvement of QoR-15 at 24 hours after surgery in the opioid-sparing group. Patients in the opioid-sparing group also had significantly lower Overall Benefit of Analgesic Score (OBAS) at 6, 24, and 48 hours after surgery, and lower Verbal Rating Scale (VRS) pain score at 6 and 48 hours after surgery. This group also had significantly less nausea and dizziness, earlier first mobilization by 2 hours, and earlier flatus by 5 hours. The utilization of PCA did not account for this difference as there was no significant

difference in sufentinil consumption. Other improvements seen in the opioid-sparing group were significantly lower incidence of intraoperative hypotension and severe bradycardia, and earlier emergence from anesthesia and extubation. The benefits of the opioid-sparing approach were mostly confined to the first 24 hours after surgery. Importantly, there was no difference seen between the two groups in overall length of stay, as well as the physical and mental scores on SF-12 at 30 days.

This study contributes to our current understanding of multi-modal pain management strategies in two important ways. First, it underscores the efficacy of neuromuscular blockade, in this case in the form of paravertebral block, to aide recovery during the postoperative period, specifically at 24 hours after surgery. This is an important component of facilitating ERAS on the first postoperative day. Secondly, it affirms the efficacy of avoiding long-acting opioid agents in the opioid-sparing anesthesia approach to improve short-term postoperative outcomes, especially within the first 24 hours after surgery.

The ideal postoperative pain management strategy continues to be a balancing act between optimizing comfort and recovery while minimizing drug-induced side effects. Routine adoption of regional analgesic delivery and systematic avoidance of longer acting opioid agents are crucial elements to bolster this effort. A multiprong approach will be necessary, and it is essential that both the anaesthesiology team and the surgical team work well hand-in-hand together to achieve this right balance. By adopting best practices in pain reduction and advancing clinical science in pain management, this inter-disciplinary collaboration will be necessary to enhance the quality of care and service that thoracic surgery patients will receive. The quest continues for the best surgical and anaesthetic regimen that will eliminate the undesirable physiological and psychological responses to pain, so as to facilitate a smooth and expedient patient journey to full recovery.

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