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Invited Commentary

'Intrathecal Morphine for Analgesia in Robotic Totally Endoscopic Coronary Artery Bypass and Myocardial Bridge Unroofing' by Trela et al

Key Words: commentary; ITM; intrathecal morphine; cardiac surgery; robotic; myocardial roofing

Drs. Trela and Dhawan have authored a case conference in which they described the use of intrathecal morphine (ITM) for 2 totally robotic endoscopic coronary artery bypass and myocardial bridge unroofing surgeries. First, I'd like to congratulate the authors for formulating and implementing a successful pain management strategy with a unique approach in this subset of patients that has certainly helped accomplish the goal of total minimally invasive robotic endoscopic surgeries (ie, enhanced recovery after surgery [ERAS] and reduced complications).

Anesthesiologists, as perioperative physicians, are always endowed with an ethical responsibility of managing postoperative pain in addition to intraoperative management of anesthesia and monitoring. The multimodal opioid-sparing analgesic approach is gaining popularity in all surgical fields in the era of ERAS, and cardiac surgery is no exception.[1]

As technology and modern medicine are evolving every day, it is opening up newer therapeutic avenues for patients, and enabling them to undergo minimally invasive procedures safely. However, it also brings several challenges to the healthcare team. Although minimally invasive procedures have greatly enhanced patients' recovery and reduced postoperative complications, they do not reduce patients' comorbidities and complexities.[1] Contrary to popular belief, sometimes these patients are quite high risk, and the surgical technique itself poses a challenging task for anesthesiologists.[2]

Robotic endoscopic cardiac surgery is a classic example of a minimally invasive procedure that intends to avoid cardiopulmonary bypass (CPB) and, thereby, significantly reduce systemic inflammatory reaction and coagulopathy associated with CPB. At the same time, the absence of CPB support burdens anesthesiologists with major hemodynamic challenges.[2] Additionally, it is worth noting that thoracotomy required in robotic endoscopic cardiac surgery is associated with significant postoperative pain.[3] Inadequate postoperative pain control can cause splinting and increase postoperative pulmonary complications by restricting patients' ability to participate in deep breathing exercises.[4] The specific dermatomal distribution of the neural pathway allows regional anesthesia to play a critical role in the management of thoracotomy-associated pain.[5] Intrathecal (IT) block is a form of neuraxial regional anesthesia that has been historically used for surgical anesthesia, as well as postoperative pain control, including postthoracotomy pain.[5] The advantages of neuraxial anesthesia in cardiac surgery include, but are not limited to, sympatholysis, reduction of arrhythmias, improved myocardial perfusion, reduced stress response, and superior quality analgesia.[6] Anesthesiologists have hesitated to use IT block in cardiac surgery that requires systemic heparinization because of the risk of the development of epidural and/or spinal hematomas.[7] Excessive sympatholysis can also cause hemodynamic instability in cardiac surgical patients with already reduced cardiac function.[7] However, robotic endoscopic cardiac surgeries do not involve CPB; hence, a smaller dose of anticoagulant is used. Moreover, single-shot IT injections, unlike epidural or spinal catheter placement, reduce the risk of hematoma significantly. Diluting or excluding local anesthetics in IT block can reduce the degree of sympatholysis as well.

ITM has been used for perioperative analgesia for some noncardiac surgeries because of its ability to prolong the duration of surgical analgesia when used as an adjuvant to local anesthetics, as well as to provide reliable and longer postoperative analgesia via a single-shot injection.[8] A recent study, using low-dose ITM, was able to demonstrate a lower incidence of side effects.[9] ITM use in cardiac surgery offers a longer duration of analgesia, reduced systemic opioid

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consumption, and early extubation, enabling 'fast-tracking' of patients. It also provides reliable analgesia and avoids patchy blocks that may result from epidural or myofascial planer blocks.[6]

In the first patient here, the authors reported a robotic totally endoscopic coronary artery bypass graft surgery in whom ITM (5 μg/kg) was administered preoperatively. The patient's pain score was reported to be anywhere between 0 to 6 in the first 24 hours, requiring only 10 mg of oxycodone every 6 hours. He was extubated in the operating room; drains were removed on postoperative day (POD) 1, and the patient was discharged on POD 2.

The second patient underwent a robotic myocardial bridge unroofing. Again, the patient had received ITM (5 μg/kg) immediately prior to induction of anesthesia. He was also extubated in the operating room and discharged on POD 2. In the postoperative period, reported pain scored from 3-to-10, with a minimal opioid requirement, including some intravenous opioids, but he was able to be transitioned to oral tramadol and oxycodone. Neither of these patients reported any opioid-related side effects.

This case conference reported 2 unique cases in which anesthesiologists implemented a postoperative pain management strategy incorporating ITM that has definitively played a critical role in enhancing patients' recovery. Both patients had satisfactory pain control, which increased their participation in rehabilitation, reduced postoperative pulmonary complications, and facilitated early discharge and returns to normalcy. In this era of technologic advancement and ERAS, as surgeons are adopting more minimally invasive surgical approaches, a multidisciplinary team involving anesthesiologists and intensivists is the key to success.

These case conferences intellectually stimulate practicing anesthesiologists and clinical researchers to generate a scientific question, create a hypothesis, and encourage them to perform larger-scale prospective studies. Therefore, it is important to continue to report these cases in the scientific literature, and I again applaud the authors for tasking themselves with such innovative methods and helping surgical colleagues to accomplish success in robot-assisted cardiac cases.

Conflict of Interest

None.

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