Commentary

Transversus abdominis plane block in laparoscopic colorectal surgery

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Beneficial outcomes of laparoscopic colorectal resection have been identified, including decreased postoperative pain, quicker functional recovery, and a shorter hospital stay. Acceptable oncologic outcomes for advanced malignancies have also been reported. Furthermore, such advances in surgical techniques may be associated with less postoperative complications. However, controlling postoperative pain, nausea and vomiting (PONV), and impaired bowel function remain major factors affecting the length of hospital stay and thus successful enhanced recovery after surgery (ERAS). Therefore, there has been a great deal of interest in analgesia for laparoscopic colorectal surgery.

Opioid analgesics, commonly used to control postoperative pain, are associated with an increased risk of PONV, impaired bowel function, urinary retention, sedation and respiratory depression. Thus, to facilitate recovery of patients who have undergone abdominal surgery, alternative analgesic modalities that utilize limited opioid use have been employed. The concept of multimodal analgesia, including some loco-regional anesthetic procedures, has also been introduced into postoperative recovery programs.

Laparoscopic procedures, with minimal trauma to the abdominal wall, can shorten intensive treatment for postoperative pain and can presumably reduce the inflammatory and neuroendocrine responses associated with surgical trauma. The optimum regimen or combination of analgesic modalities in laparoscopy may therefore be different from that required for open surgery.

Whilst epidural analgesia is considered a prerequisite in ERAS programs for open colorectal surgery, its role in laparoscopy has been questioned. Recently, undesirable effects of epidural analgesia during recovery from laparoscopic colorectal surgery have been reported in several randomized controlled trials (RCTs). These undesirable effects include increases in length of hospital stay, time to recovery of bowel function and duration of nausea (1).

The transversus abdominis plane (TAP) block, in which local anesthetic is injected into the neurovascular plane between the transversus abdominis and the internal oblique muscle to block the sensory nerves of the anterior abdominal wall, is an alternative form of postoperative pain control (2). Ultrasound-guided TAP blocks (3) are preferentially employed because of the accuracy afforded by clear visualization of the abdominal wall. This procedure is presumably effective for longer periods of time and offers better pain control when compared to local wound infiltration. The peripheral nerve blocks may help reduce the pain elicited by incising the abdominal wall whilst minimizing the adverse effects of analgesia. However, there is limited evidence for the efficacy of TAP blocks in laparoscopic colorectal surgery.

We read, with great interest, the manuscript published by Dr. Pedrazzani *et al.* in the November 2016 edition of Surgical Endoscopy (4). In a prospective non-randomized study, the authors evaluated the efficacy of local wound infiltration plus TAP block, compared to local wound infiltration, in patients who underwent laparoscopic colorectal surgery under the ERAS program. The

additional use of TAP block allowed pain control despite a reduced dose of opioid analgesics. Overall, this manuscript appears consistent with the previous double-blinded RCTs by Keller *et al.* (TAP *vs.* placebo) (5) and Walters *et al.* (TAP *vs.* no treatment) (6) Nonetheless, we should note that there were some discrepancies between these studies when each outcome measure is carefully analyzed.

Furthermore, the authors of the current manuscript report that adoption of a TAP block produced further beneficial results, i.e., prevention of PONV, facilitating recovery of bowel function and urinary catheter removal, plus acceptable tolerance of an oral diet. These remarkable effects can be explained, at least in part, by the reduced requirement for opioid analgesics. Thus the TAP block is capable of suppressing the intense pain produced by incising the abdominal wall for one or two days after surgery, and would appear to be a promising technique enabling quicker patient recovery after laparoscopic colorectal surgery.

However, two recent double blind RCT in patients undergoing elective laparoscopic colorectal resections failed to show any benefits of TAP block, including reduced pain scores or opioid consumption (7,8). The efficacy of ultrasound guided TAP block was evaluated in the management of postoperative pain compared to local wound infiltration or placebo control, and the authors report that the effects of TAP block were comparable to those of the controls both in terms of postoperative pain and analgesics dose.

Overall, a definitive answer is thus not readily available on the question of TAP block efficacy for postoperative care. These contradictory results may be due to the complexity of pain assessments or variability in background treatment for postoperative pain. The aforementioned clinical trials were conducted at a single center, and the sample size in each study appears to be too small to compensate for the inherent uncertainty in quantification of pain and other symptoms. Further studies are thus required to confirm the effectiveness and clinical relevance of TAP block in laparoscopic colorectal surgery. The concept of using TAP block in the postoperative period to suppress parietal pain is of significant interest, and, if repeated and consistently confirmed, may become the future standard moving forward towards improved surgical outcomes.

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