Does the Analgesic Technique in the Intraoperative Period Have Any Influence on Chronic Pain after Uniportal Video-Assisted Thoracoscopic Surgery?

VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) is increasingly used as an approach to pulmonary resections, including lobectomy, segmentectomy, and lung wedge resection. These patients require multiple surgical and intercostal port incisions and chest tube placement. The incidence of chronic postoperative pain after VATS has been reported to be as high as 25%-47% after 3 or 6 months, mostly owing to surgical incisions, local trauma, and the presence of shoulder pain syndrome.1,2 The treatment of acute or chronic postoperative pain after VATS continues to be controversial. It is widely accepted that VATS reduces acute postoperative pain and analgesic requirements compared to standard thoracotomy. However, studies comparing the occurrence of chronic postoperative pain in thoracotomy versus VATS have shown no difference in the incidence of chronic pain.3

A different surgical option for VATS to reduce the incidence of acute or chronic pain is the uniportal VATS approach. The uniportal VATS technique has been proven to be a safe and feasible surgical technique, including for complex thoracic surgical cases.4 The advantage of this technique is that it requires a single, 2- to 4-cm incision usually made in the fifth intercostal space between the anterior and middle axillary line. The incision is performed according to muscle-sparing principles in which the fibers of the serratus anterior muscle are opened without being cut and no rib spreading is necessary.4 Recent studies have shown a reduction in the incidence of post-thoracotomy pain syndrome during uniporal VATS when compared with conventional multiportal VATS.5 In this issue of the journal, Wang et al.6 report an interesting study regarding the influence of anesthesia technique or analgesia methods used in a cohort group of patients undergoing uniportal VATS to determine factors that influence the development of chronic postsurgical pain. Although the hypothesis of the study is good, the study itself presents some flaws. For instance, the abstract reports that the design of the study is retrospective in nature, in contrast to the method section and different parts within the article that state that it is a prospective, observational study.

The study design indicates that the patients were divided into 3 groups: group I received general anesthesia and a nerve block (paravertebral and anterior serratus plane block); also, patient-controlled intravenous analgesia (PCIA) was administered after surgery. Group II received general anesthesia and PCIA only, and group III received general anesthesia, epidural block, and patient-controlled epidural analgesia (PCEA). Interestingly, the numbers of subjects enrolled in the 3 groups were not equal in distribution—this may introduce a component of bias. It is unclear if administration of anesthesia and postoperative pain control was selected based on surgery indications or expertise of the regional anesthesia team. In addition, there was no description of the nerve blocks or epidural block placement, or of the level of epidural block placed for these uniporal cases. The same is also true for the nerve blocks—there are no data to indicate what level was performed for the thoracic paravertebral block and the anterior serratus plane block, and if this was done at a single level or multiple levels. Furthermore, there is no information provided regarding what type of local anesthetic was used for each block because this will affect duration of postoperative analgesia. For instance, the use of liposomal bupivacaine for paravertebral blocks in VATS has shown an analgesic effect up to 72 hours.7 In addition, there are pain adjuvants that can be administered during surgery such as ketamine, lidocaine, and magnesium that would lower pain scores postoperatively without having a direct effect on the actual hypothesis.

Another flaw on the design of this study is that it did not standardize the postoperative pain regimen for each patient studied. Two groups received a PCIA, and one group received a PCEA. There is no mention of the medication used for the PCIA, and the authors question whether the PCEA patients received local anesthetics in the epidural only, or narcotics, or both? In the patients receiving PCEA, were any additional supplemental narcotics given? Finally, it is important to know who managed the pain regimen postoperatively in these

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Acute and chronic pain after VATS continues to be an important issue and in general is treated with multimodal analgesia. Wang et al. evaluated postoperative pain at 3 months and 6 months focusing at pain scores only; pain was recorded at rest and coughing. They used a visual analog score (VAS) postoperatively and a numerical rating scale (NRS) at 3 and 6 months. Pain scores were recorded as the most severe pain the patient experienced; for consistency in the study, the scales should have been the same throughout the study to prevent a bias. It also may have been more meaningful to present the data based on reflected pain scores at rest and with activity at 3 months and 6 months. In order to evaluate chronic postsurgery pain, the authors should have included the milligram morphine equivalents that the patients used postoperatively. This would have been a better reflection of pain control than VAS postoperatively. A patient with a low pain score but high milligram morphine equivalents does not reflect a successful intervention. Furthermore, there is no report in this study of the length in time of narcotic use postoperatively. This can affect pain scores at 3 and 6 months as well. Another area that deserves special attention is the exclusion criteria used in their study. Chronic pain patients were excluded so as not to confound the data. However, the patients were excluded for chronic pain by asking them preoperatively if they had chronic pain. There were no preoperative pain assessments, psychological assessments, or medication reviews; this may have caused a bias by not excluding the correct patients.

This study had an interesting hypothesis on an increasingly emerging surgical technique. As enhanced recovery after surgery techniques in thoracic surgery become more prevalent, they will likely lead to even more evaluation of whether or not the anesthetic or analgesic technique used intraoperatively has any influence on chronic pain. It would be interesting to follow this study re-designed to have enhanced recovery after surgery protocols in place.

The authors of the study claim that the occurrence of chronic postsurgery pain during uniporal VATS has not been studied; we disagree. Hirai et al. have reported the incidence of post-thoracotomy pain after uniporal VATS after 2 months to be 2.8%; this stands in contrast to Wang et al., who reported an incidence of 29.7% of chronic postsurgery pain at 3 months after the surgery and only 9% after 6 months. Why are the results so different? Without specific information about the specific anesthetic/analgesic used it is quite difficult to withdraw any conclusions. Also, in Hirai et al., the patients were evaluated after 2 months postsurgery. In contrast, Wang et al., in follow-up evaluation were limited to phone calls at 3 and 6 months. The assessment of chronic postsurgery pain or post-thoracotomy pain syndrome after 2-4 months requires specific information. The frequency of postoperative wound pain can be assessed by an NRS, with mild pain being a score of 1-3. In Wang et al., patients had an NRS <1, which is considered mild; however, no information was sought regarding the analgesics or anti-inflammatory agents that their patients were taking at 3 or 6 months. Also, another piece of important information missing from this study is the lack of assessment of neuropathic pain based upon the pain Detect questionnaire, which is based upon 7 components: allodynia, hypoesthesias, numbness, hyperalgesia, pricking, burning, and aching sensation. None of these components were investigated in the Wang et al. study.

In a regression analysis, the investigators identified the incidence of severe pain based on VAS on postoperative days 1 and 2 regardless of the group assignment of anesthetic/analgesic method used. This acute pain played a role as a contributing factor for the development of chronic pain. What is known is that spreading the ribs or damaging an intercostal nerve can contribute to the development of chronic pain, and it is important to study nociceptive and neuropathic pain to determine the incidence of chronic postsurgery pain. In fact, the use of VATS by a uniporal or multiportal approach may not eliminate intercostal nerve injury because scopes are heavily manipulated during the procedure, which may cause the nerve to be crushed or damaged against the adjacent rib. Also, rib retractors or trocar insertion in VATS may cause intercostal nerve injury, which may explain the incidence of chronic postsurgery pain.

The Wang et al. study has limitations: lack of clarity regarding study design (retrospective or prospective observational study), the limited sample of subjects enrolled, and lack of randomization or power analysis, leading toward bias in the study. In addition, there was no comparative group with different surgical techniques to demonstrate the advantages of a uniporal versus multiportal approach in relation to chronic postsurgery pain. No anesthetic/analgesic information was given intra- or postoperatively, which makes it difficult to draw any specific conclusions from this study to determine the influence of VATS on the anesthesiology/analgesia technique used intraoperatively and the development of chronic pain. Also, there was no information provided regarding the location of the pain (incisional or shoulder pain) in any of the patients studied, which limits interpretation of the results.

The authors thank Dr. Wang et al. for their interesting hypothesis; unfortunately, the study is not robust enough to demonstrate the true incidence of chronic postsurgical pain after uniporal VATS because of limitations of the study. Future studies are needed with more specific information to determine the influence on anesthetic/analgesics on acute and chronic pain after uniporal VATS.

Conflict of Interest

The authors have no conflicts of interest to disclose.

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References


