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COMPARISON OF OUTCOMES BETWEEN MUSCLE-SPARING THORACOTOMY AND VIDEO-ASSISTED THORACIC SURGERY IN PATIENTS WITH

cT1 N0 M0 LUNG CANCER

To the Editor:

We read with interest the article published by our colleagues Zhao and associates¹ from Fudan University in the October 2017 issue of the *Journal*. The article retrospectively compares the perioperative outcomes of muscle-sparing thoracotomy with those of video-assisted thoracic surgery (VATS) by applying a propensity-matched analysis to 241 pairs of patients. Zhao and associates¹ conclude that VATS was associated with decreases in hospital stay and postoperative complications.

When comparing the technical aspects of the procedure, the only significant difference between VATS and muscle-sparing thoracotomy was rib spreading, and not the size of the skin incisions. Although Zhao and associates¹ succeeded in matching the pairs of the patients with many patient and tumor characteristics, they failed to address 2 crucial factors that affect the perioperative outcomes when comparing surgical techniques: the surgeon and the pain factors.

When it comes to VATS, although there seem to be as many ways to perform the procedure as there are surgeons, it is important to note that surgeons who perform VATS also tend to have different and more aggressive chest tube management strategy and discharge practices than those who perform open surgery. The article did not address who performed the surgery, and that key factor was not used in the matching algorithm.

Pain is one of the major factors associated with perioperative morbidity and a prolonged stay. It is well established that minimally invasive surgery is associated with less pain than thoracotomy. The difference in pain between the 2

procedures disappears, however, if patients are enrolled on care maps that address pain in a multilevel way, such as described by Rice and colleagues² and by Mehran and associates.³ The method of analgesic management was not documented in the study reported by Zhao and colleagues.¹ The differences the authors noted between VATS and muscle-sparing thoracotomy thus should be interpreted with caution, because not all the elements contributing to these differences were accounted for in their methodology and analysis.

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DIRECT COMPARISON BETWEEN VIDEO-ASSISTED THORACOSCOPIC SURGERY AND MUSCLE-SPARING MINITHORACOTOMY IN

THE ERA OF MINIMALLY INVASIVE THORACIC SURGERY

Reply to the Editor:

We thank Mehran and colleagues for their interest in our article.¹ Video-assisted thoracoscopic surgery (VATS) has become increasingly popular worldwide. Numerous studies have shown VATS to be associated with shorter hospital stays and lower rates of postoperative complications compared with conventional open thoracotomy, and some have also shown equivalent survival outcomes for early-stage lung cancer.^{2,3} VATS may also, however, increase difficulty of surgery and prolong operative time. The efficacy of complete lymphadenectomy is also questioned. Muscle-sparing thoracotomy (MST) also has significant smaller incision and is associated with better postoperative physical activity and less nerve impairment

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than traditional thoracotomy.⁴⁻⁶ It is therefore also a widely applied approach. Studies directly comparing VATS and MST, however, are still limited. In our study,¹ in which we used a propensity score-matched comparison, we showed VATS to be associated with lessened short-term complications and shorter hospital stay, whereas long-term survivals were equivalent between the groups.

In terms of confounding factors, Mehran and colleagues raise very good questions about variations in surgeons and the pain control. We agree that generally surgeons' preference may have an impact on which procedure is used and deserves respect. In this single-center study, surgeons performed both VATS and MST in large volumes, and the criteria for tube management and discharging patients were the same regardless of which approach was applied. Pain and quality of life are also important topics in the comparison of these procedures. We did not use these factors in the propensity-score matching algorithm, because pain was an outcome rather than a preoperative confounding factor and thus might mislead the results. A recent randomized, controlled trial demonstrated VATS to be associated with less pain than anterolateral open thoracotomy for the first year after surgery; however, limitations of that study included small sample size and the incompleteness of pain and quality-of-life data.⁷ In our cancer center, epidural analgesia with self-controlled analgesic bolus is routinely used for patients who undergo either MST or VATS. Intravenous flurbiprofen and a fentanyl patch are used if needed. There is limited study directly comparing pain after VATS and MST; and this comparison certainly merits further investigation in future studies.

In the era of minimally invasive thoracic surgery, no minimally invasive approach should be performed at the cost of compromised long-term survival for patients with cancer. Moreover, it is far more important for minimally invasive surgery to focus on reducing internal organ injury and systemic damage than to focus on reducing incisional injury alone. That is what we call "minimally invasive thoracic surgery 3.0" for a comprehensive approach to reduce surgical trauma.⁸ There are only limited number of randomized trials focusing on the comparison between MST and VATS; however, it is expected that more evidence will come out in the future to clarify this topic.

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ARE WE COMPARING APPLES AND THORACOTOMIES? Reply to the Editor:

Mehran and colleagues raise an important point in their letter to the Editor that adequate pain control is a hallmark of thoracic surgery, and that operating through a thoracotomy is not mutually exclusive with providing adequate analgesia. In addition, they rightly point out that length of stay is a somewhat arbitrary metric, and that early recovery pathways are getting all patients out of the hospital faster, regardless of surgical approach and across a variety of surgical disciplines and patient cohorts.¹ In the article that they cite by Rice and associates,² it is true that the pain scores equalized between video-assisted thoracoscopic surgery (VATS) and thoracotomy in the liposomal bupivacaine