

Peer Review File

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Reviewer A

Comment 1: In line 85; Further descriptions might be helpful to readers on why this practice was not adopted in the ear of 1980s. of old review reference.

Response 1: Lines 58-63 have been added to address why VATS in trauma patients expanded through the 1990's and 2000's. This time period correlates with the expansion of VATS in elective thoracic surgery and accumulation of evidence of its efficacy in some trauma indications.

Comment 2: History of 1990-2023 can be added about the advancement of VATS in trauma in this section prior to following categorized mentions on specific diseases.

Response 2: Lines 58-63 have been added to cover advancements in the 1990's and early 2000's. Generally, there was an accumulation of evidence supporting the use of VATS in trauma patients and continued demonstration of the safety and efficacy of VATS in elective thoracic surgery.

Comment 3: Some impressive surgical images or movies containing recent VATS for trauma can be helpful for comprehensive reviews.

Response 3: We agree and unfortunately we do not have such images.

Reviewer B

The usefulness of VATS in trauma patients was well-reviewed. Recently, In the increasing interest in VATS in trauma, this review will be a good reference in selecting VATS as a surgical method in trauma patients.

Reviewer C

Comment 1: On the other hand, thoracoscopic surgery is inferior to open thoracic surgery in cases of chest trauma from the viewpoint of securing the field of vision in two major points: one is that it is difficult to secure the field of vision under a thoracoscopy when intrapleural bleeding is heavy, and it is impossible to stop bleeding in massive hemorrhage. Therefore, thoracoscopic surgery is not indicated for massive hemothorax, in which bleeding must be stopped as soon as possible to stabilize the vital organs. Another point is that in the case of blunt chest trauma, the greater the impact at the time of injury, the more likely it is that the injured lung will become pulmonary edematous, resulting in intrapulmonary hemorrhage, making thoracoscopic surgery difficult. In such cases, thoracoscopic surgery should be switched to standard open thoracotomy or be selected from the beginning. I hope for your response to the above comments and, if necessary, expect improvement of the paper.

Response 1: These points are well taken and have been incorporated into the manuscript in lines 79-81.

Comment 2: In general, blunt trauma is less likely to be an indication for thoracoscopic surgery because the injury site is often extensive, with many areas of bleeding and injury. Is it possible to discuss whether or not VATS for trauma is indicated not only by the site of injury but also by the mechanism of injury? On the other hand, sharp trauma such as stab wounds are more likely to be indicated for thoracoscopic surgery because the injury site is more limited. I hope for your response to the above comments and, if necessary, expect improvement of the paper.

Response 2: The authors were unable to find studies in the literature that have compared blunt and penetrating chest trauma as it relates to the utility of VATS. The studies that we reviewed and have referenced in the manuscript describe specific injuries or injury patterns according to anatomy of the injury rather than mechanism. The Reviewer's point is well taken and would be an interesting retrospective review.

Reviewer D

Comment 1: Readers cannot understand what is the clinical question? You need to describe the reason of this review in introduction section.

Response 1: We have added additional context in the Introduction, lines 15-25.

Comment 2: The review is not comprehensive.

Response 2: We have limited our discussion to injuries and ailments that are commonly encountered by thoracic surgeons or trauma surgeons, and for which there is adequate available published evidence. We have added a discussion of the limitations of this review in lines 332-337.

Comment 3: Many of crucial descriptions, such as guidelines, lack the quotations.

Response 3: This manuscript is intended as a narrative review of the topic and we agree that major society guidelines are an important component of the review. We also include extensive discussion of available evidence for topics or questions that have no guidelines. All society guidelines and published articles are appropriately referenced as endnotes.

Comment 4: Quotations should be attached to the corresponding descriptions.

Response 4: Guidelines and statements from national societies are paraphrased and succinctly summarized to improve the readability of the manuscript. All guidelines and published articles are appropriately referenced as endnotes.

Reviewer E

Comment 1: Consider referencing one or two recent epidemiological studies that explore the incidence and prevalence of thoracic injuries. This would provide valuable data to substantiate the necessity of conducting the review.

Response 1: This has been added to the Introduction, lines 15-24.

Comment 2: Incorporating a brief statement outlining the driving factors behind the growing adoption of minimally invasive approaches in trauma, such as reduced morbidity and expedited recovery, would effectively set the context for the review's rationale.

Response 2: This has been added to the introduction, lines 15-24.

Comment 3: You might want to explore the optimal timing of VATS to mitigate the risk of empyema, the necessity for converting to open thoracotomy, and the subsequent intervention requirements.

Response 3: We have added additional detail in lines 116-119.

Comment 4: Additionally, incorporating a concise table that compares clinical outcomes between VATS and intrapleural fibrinolytics for cases involving retained haemothorax would enhance this section by providing readers with tangible and easily digestible data.

Response 4: This is an excellent suggestion. Relevant studies comparing the two modalities are difficult to compare to due differences in the diagnosis, randomization, treatment algorithm, definition of outcomes, etc. The suggested table risks unfairly comparing these studies directly.

Comment 5: Consider including a discussion on the optimal management approach for occult pneumothorax.

Response 5: Occult pneumothorax is an interesting topic, but since there is no role for VATS in the management of occult pneumothorax outside of what is already included in the section on persistent air leak, it does not fit within the scope of this review.

Comment 6: Providing additional details regarding the distinctions between thoracoscopic and laparoscopic techniques for diagnosis, along with the guiding principles to aid in approach selection, would offer valuable insights to readers contemplating the use of these methods. Furthermore, including a succinct comparative table highlighting the differences between these two surgical approaches could further enhance the understanding of readers.

Response 6: We agree and have added significantly to this section of the review. See lines 182-196, lines 199-217, and a new table.

Comment 7: The conclusion effectively summarizes the current status of VATS in trauma. To enrich it, you may want to include a sentence or two highlighting areas in need of further research and promising future directions. This would help emphasize existing gaps and opportunities for advancing the field.

Response 7: This has been added to the conclusions, lines 352-354.

Comment 8: Consider a discussion of limitations both within the included evidence and inherent to the present review. For instance, these limitations might

encompass the absence of a systematic, quantitative analysis and the lack of an assessment of study quality and risk of bias.

Response 8: We have added a strengths and limitations section in lines 321-326

Reviewer F

Comment 1: The optimal timing of surgery was not described in manuscript for diaphragm injury, hemopericardium, and rib fracture. Vats surgery is now so common that it can be applied to almost any surgery. So, the indications for vats in trauma and timing of surgery are more important.

Response 1: Diaphragm injuries, whether acute or chronic, should be repaired at time of discovery; we have added additional discussion of chronic traumatic diaphragm hernia in lines 182-214. The timing of surgical management of pericardial effusion and chest wall injury are highly variable based on the specific details of the patient's injuries; the use of VATS in comparison to another modality does not impact timing.

Comment 2: In guidelines of review article for authors, you can check that the journal requires discussing on strengths and limitations of the review. I recommend that you meet the journal's requirements.

Response 2: This has been added, lines 321-326

VATS-23-61

Reviewer G

Comment 1: Page 5, lines 106-107. To my knowledge, there is no general definition of residual hemothorax. However, a predictor for the development of posttraumatic pleural empyema is a residual hemothorax volume greater than 300 cc, as well as the concomitant presence of rib fractures and an overall severity of trauma with an Injury Severity Score (ISS) of 25 points or higher.

DuBose J, Inaba K, Okoye O et al. Development of posttraumatic empyema in patients with retained hemothorax: results of a prospective, observational AAST study. *J Trauma Acute Care Surg* 2012; 73: 752-757. doi:10.1097/TA.0b013e31825c1616

Eren S, Esme H, Sehitogullari A et al. The risk factors and management of posttraumatic empyema in trauma patients. *Injury* 2008; 39: 44-49. doi:10.1016/j.injury.2007.06.00

Response 1: We agree with this comment. We cite DuBose et al in lines 89-93 – “No consensus exists on precise volumes of small, moderate, or large retained hemothorax, however a multicenter prospective trial found that estimated retained hemothorax volume less than 300ml was the single strongest independent predictor of successful observation.”

Comment 2: Page 7, 158ff. I agree with you that most diaphragmatic injuries escape conventional diagnostics (X-ray, CT) and are diagnosed intraoperatively. However, the clinical relevance of such injuries remains unclear. Secondary

diaphragmatic herniation due to trauma is described in some case reports at best. Is there any data on this topic?

Response 2: We have added significantly to the section discussing chronic traumatic diaphragm, see lines 182-214.

Comment 3: Page 8, line 187 ff. It should be described more clearly in the text that VATS does have a value in cardiac/pericardiac injury. However, except a relief of pericardial effusion, videoscopic treatment of cardiac injury patterns is rarely possible. Here, more invasive approaches are unavoidable in most cases. Our own experience shows that a sternotomy is rarely necessary, but in most cases cardiac injuries can be treated via anterolateral thoracotomy.

Response 3: We have added lines 261-265 to the section on hemopericardium to clarify this point.

Comment 4: Lastly, page 10, line 215ff. Osteosynthetic treatment of rib fractures using VATS technique is not commonly performed by the majority of trauma surgeons. However, VATS is obligatory for the identification of rib fractures! Not all fractures of a rib series fracture have to be stabilized. VATS is a reliable instrument for identifying relevant fractures and to treat these specifically - also in order to minimize surgical trauma. The topic should be mentioned and described more clearly in the manuscript.

Reindl S, Jawny P, Girdukas E, Raab S. Is it Necessary to Stabilize Every Fracture in Patients with Serial Rib Fractures in Blunt Force Trauma? *Front Surg.* 2022 Jun 9;9:845494.

Response 4: This is an interesting application of VATS in the management of chest wall injury and has been incorporated into our review, see lines 304-307.

Comment 5: Since the entire manuscript is more like a narrative review, the title should perhaps be changed to "VATS in Trauma: A narrative Review."

Response 5: We agree this is a narrative review.