Peer Review File
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Review Comments:
Reviewer A

Thank you for performing this work. It is a relevant subject from daily practice with still differences in practice between individual surgeons, centres and countries. Robust scientific evidence for the mentioned endpoints is missing, although several multicentre randomised studies are on their way. In addition implementation of ERATS strategy also elaborates on this subject. In my opinion we as surgical community need to invest in executing and providing data to robust RCT to improve evidence. In the literature there are several literature (systematic) reviews (incl from Japan) on this subject, few examples are (Gen Thorac Cardiovasc Surg (2016) 64:305–308. J Thorac Dis 2023 Feb 28;15(2):901-908 doi: 10.21037/jtd-22-1373 Epub 2023 Feb 24. World J Surg 2017 Aug;41(8):2039-2045 doi: 10.1007/s00268-017-3975-x). I do not see additional scientific value of another review. Even though this work provides a good overview of the literature and is well written.

Reply: Thank you for your feedback. As you showed, there are already reviews about thoracic drainage, and we have revisited the reviews you provided. These reviews mainly mention the merits of the digital drainage system and an aggressive drainage tube removal strategy (450 or 500 ml/day is acceptable for removing drainage tubes). In practical medical situations, not all doctors use the digital drainage system or the aggressive drainage strategy. There must be counterarguments and real cautions among them. We believe that the significance of the review also lies in highlighting those cautions and issues.
Therefore, we believe that our review is valuable because it presents data objectively and includes caveats for each method.

Reviewer B

The authors discuss management strategies for drainage systems, including the benefits of digital drainage system, appropriate intrathoracic pressure for the postoperative management, and lung fluid volume threshold for safe drainage tube removal.
The content is easy to understand, and the reader will be able to put it into practice. However, some corrections are needed before acceptance and grammatical errors are recognized.

1. In line169, as the authors point out, drain removal criteria for drainage volume have also changed over time. Indeed, a threshold of 200 ml was common, but this is due to past reports, and we recommend that the following paper be cited.

・Younes RN, Gross JL, Aguiar S, Haddad FJ, Deheinzelin D. When to remove a chest tube? A randomized study with subsequent prospective consecutive validation. J Am Coll Surg. 2002 Nov;195(5):658-62. doi: 10.1016/s1072-7515(02)01332-7. PMID: 12437253.

Reply: Thank you for your suggestion. We included the reference you provided.

2. In lines 154 and 155, the 2 in "H2O" should be subscripted, but the description of the manuscript is not subscripted.

Reply: Thank you for your feedback. We have revised the manuscript accordingly. Changes in the text: H2O → H_2O

3. In the References, the description of articles may be different from the submission rules of this journal, please read again and correct them.

Reply: Thank you for your feedback. We have corrected the references according to the submission rules of this journal.

4. In reference 4, star after “analysis” should be removed.

Reply: Thank you for your feedback. We have revised the manuscript and removed the star after "analysis."

Reviewer C

I have read and reviewed the submitted manuscript “Thoracic Drainage Management Strategies in Postoperative Lung Surgery: a narrative review”. This is a literature review of digital pleuravacs. While the evidence presented in this paper is sound, it also does not present all the data and appears to miss key published papers. A review article should be more thorough.

Major Points:
1. While I do not disagree with the authors editorial that chest tube management is uncommonly based upon scientific evidence, this is actually not supported in this paper or with a reference from other researchers that have studied this point. The authors should cite a source for this comment or reconsider the approach to the topic

Reply: Thank you for your feedback. We have revised the manuscript in response to your feedback.

Changes in the text:
However, no uniform or best drain management method is known, and drain

management methods are likely to be determined based on the experience and tradition of each facility and each physician.

2. By stating in section 1.3 “advantages of digital …” shows that the authors have an inherent bias. A review paper should be bias free and present the data and arrive at conclusions. One of the true purposes of this manuscript is to outline the differences between digital and traditional drainage systems. If one is superior, that will come out in the demonstration of the data.

Reply: Thank you for your feedback. We have revised the manuscript to use the word "feature" instead of "advantage" unless there is data showing an evident advantage.

3. The paragraph about cost of a digital pleuravac is confusing. How can the usuage cost of a traditional system be 10 Euros and then report that the same traditional system costs $50.

Reply: Thank you for your feedback. We have deleted the expression regarding specific prices to avoid confusion.

4. The entire paragraph about PAL and digital pleuravacs is contradictory. How does the increased suction lead to PAL but studies show that the tube comes out about a day sooner? While the authors quote the study by Adachi, it is an outlier in terms of chest tube duration comparing water seal to digital pleuravac. There a numbers papers, please consider papers by and of the following first authors: Cerfolio, Miller, Pompili, Shoji, or Bertolaccini (which is reference 10 in the current manuscript).

Reply: Thank you for your feedback. While previous reports indicate that the use of digital systems shortens the time to drain removal, we believe that this is primarily the case without pulmonary leakage. We understand the mechanism proposed by Adachi in cases with air leakage, and the PAL was actually prolonged in his report. Reports other than his included not only patients with air leakage. A meta-analysis concluding the duration of PAL only in patients with air leakage was not revealed. Therefore, we believe that the use of the digital system may need to be approached with caution only in cases with air leakage, and I cannot regard his report as an outlier, although we cannot draw conclusions from one RCT.

5. There are numerous recent studies looking at cost that all demonstrate that overall use of digital pleuravacs are a net cost savings for a hospital compared to traditional drainage systems. A more care evaluation of the literature would be of benefit.

Reply: Thank you for your feedback.
There is no dispute that if a shorter period of drainage means a shorter hospital stay, then the medical cost will be lower. However, we believe that there are cases where

this is not applicable, particularly in Japan.
For instance, if a facility decides to discharge a patient on POD6 regardless of when the drain is removed, we do not anticipate a significant difference in medical costs whether the drain is removed on POD1 or POD5. We believe that this fixed length of hospital stay is largely influenced by differences in insurance systems and culture. Therefore, we want to emphasize our opinion that while we agree that many patients will have their drains removed a day or so earlier, the cost benefits derived from this may vary by country and region.

6. The authors appear to have missed the first paper that randomized patients to suction versus water seal (Marshall et al. Chest 2002;121:832-5). It is from this paper that many others looked into the use of water seal. This and other studies refute the authors claim of "further studies are needed to confirm the findings" that with a traditional drainage system that water seal allows air leaks to seal faster compared to the same system with suction.

Reply: Thank you for your feedback. We have citated the report, and we removed the expression "further studies are needed to confirm the findings".

7. Since 2008, the chest tube output volume where it is safe to remove the chest tube has been published. A more important question for the authors to consider is: Why is the published evidence NOT followed?

Reply: Thank you for your feedback. We believe this review is valuable in shedding light on the fact that the evidence reported so far has not been widely adopted into clinical practice, possibly due to a lack of knowledge dissemination and the fragility of the evidence. We hope this review will be useful for knowledge dissemination. However, as indicated in the cited literature, there was a report that after adopting the threshold of thoracic effusion reported by Cerfolio, rehospitalization increased. Perhaps there are differences in the criteria for pleural effusions based on the procedure, race, or body size, and it may be premature to draw conclusions based on only two RCTs. In addition, we feel that in Japan, there are few institutions that use 500 ml/day as a standard threshold for tube removal. In light of the above, we believe that the number of facilities that change their standards will increase as knowledge spreads, and the accumulation of evidence and daily practice may change over time.

8. The authors state that "limited manpower in Japan" is the reason to not remove chest tubes on the same day as surgery. In fact there is accumulating evidence that drains can be removed intraoperative and the patient arrives in the recovery room (PACU) without a chest tube after pulmonary resection. While this is early reports,

manpower should not be a barrier, however a statement saying data is evolving on this topic is reasonable.

Reply: Thank you for your advice. Our intended message is that early release from bed, an early start to eating, and subsequent appropriate assessments are necessary for same-day drain removal. Therefore, the text was changed as follows

Changes in the text:
While this may not be a burden in hospitals where patients can be weaned on the day of surgery, meals can be started, and subsequent drain evaluations can be performed appropriately, some hospitals may have these issues to address first. If the drain is removed before adequate evaluation and later air leakage or chylothorax becomes apparent, the drain will need to be reinserted. Consequently, drainage tube removal on the day of surgery may have issues to be addressed but can offer potential benefits.

Minor Points:

1. I would recommend spelling out “versus” instead of using the abbreviation “vs” in the ABSTRACT.

Reply: Thank you for your feedback. We have spelled out "versus" instead of using the abbreviation "vs" in the ABSTRACT.

2. While the search may have occurred in 2023, what time frame did the authors actually cover for the papers reviewed for possible inclusion into this manuscript? The way it is currently written, only papers from August to October of 2023 were included.

Reply: Thank you for your feedback. We have revised the expression as follows:

Changes in the text: Searches were conducted through PubMed from July 2023 to October 2023, using the following keywords; “drainage management”, “digital drainage system”, “thoracic pressure”, “water seal” and “lung resection”. No restriction was placed on the year of publication of the articles.