

Peer Review File

Article information: <https://dx.doi.org/10.21037/acr-23-76>

Reviewer A

Comment

In the introduction, the need and indication for trauma pneumonectomy would be mentioned in more detail (life treating massive hemorrhage, main bronchus rupture)

Response

Thank you for this comment. We have included a sentence regarding indication for trauma pneumonectomy.

Changes in text

We have modified our text as advised (see page 4 line 70-72).

Comment

It is better to write a brief explanation about the chest x-ray in the manuscript - 'pneumonectomy by stapling across the pulmonary hilum. Technically, this refers to stapling the whole hilum at once rather than stapling each structure (vein, artery, bronchus) one by one. This may be possible due to the urgency may be understood, but this needs a clear definition. On the other hand, this mass stapling may be the reason for the defect on the bronchus afterward would you like to comment on that?

Response

Thank you for this comment, we included a more clear description of how the hilum was stapled in entirety and not individually dissected out and ligated due to patient extremis and hemorrhage. Additionally we added a comment regarding the likely etiology of the bronchial defect secondary to mass ligation of the hilum.

Changes in text

Please see the modified text on page 4 lines 86-89.

Comment

This patient had bronchopleural fistula theoretical management of this needs to be mentioned I am personally not convinced about y stent application for BPF.

Response

Thank you for this important point. It is true that a stent is not common practice for a bronchopleural fistula. In our patient, however, he was so unstable that decubitus positioning and operative exploration was thought to be too high risk. The stent was meant to be a temporizing step until he recovered for definitive treatment. But we agree with you that we should mention that stenting is not typical for bronchopleural fistulas.

Changes in text

In lines 153-157 we have added "In addition, the bronchopleural fistula was temporized by the pulmonology team with stenting and a bioprosthetic patch. Although stenting is typically not used for this indication, our patient was too unstable to undergo definitive surgical repair in the operating room. This further example of multidisciplinary

management led to our patient ultimately surviving his injury.”

Comment

The hemodynamic instability following the surgery needs some potential explanation.

Response

This is a good point that is raised. It is likely that the combination of ARDS and acute right ventricular failure led to the hemodynamic instability. We have added this to the manuscript.

Changes in text

In lines 117-119 we have added “In addition, acute right ventricular failure can lead to hemodynamic instability. It is likely that a combination of acute right ventricular failure and ARDS caused the profound hypotension in our patient.”

Comment

The management period in ICU with intubation style (probably single lumen in the left main bronchus) mechanical ventilation modes and its progress will be written in more detail.

Response

You are correct that we did a left mainstem intubation with a single lumen tube. Eventually we backed the tube above the stent immediately after the stent was placed.

Changes in text

In lines 98-99 we have added “He was initially managed with a single lumen endotracheal tube that was advanced into the left mainstem bronchus.” In lines 103-104 we have added “The endotracheal tube was withdrawn to the distal trachea, above the stent, to avoid manipulation and migration of the stent.”

Comment

A general overview of the paper is needed.

Response

Thank you for this comment. We have included a general overview of the paper in the conclusion section.

Changes in text

Please see modification of the text on page 7, lines 137—140.

Reviewer B

Comment

I would like to thank the handling editor for offering me the opportunity to review the manuscript entitled “Trauma pneumonectomy followed by ECMO cannulation: a case report” authored by Hutchings and colleagues, which is currently under consideration for publication in AME Case Reports. I would also like to commend the authors for their scholarly work, which presents an intriguing and informative case report. The authors report the case of a 35-year-old male who patient who survived a traumatic gunshot wound to the right lung following an emergency pneumonectomy, with the

assistance of veno-venous extracorporeal membrane oxygenation (VV-ECMO). The patient developed acute respiratory distress syndrome post-operatively, requiring emergent cannulation for VV-ECMO. With a multidisciplinary approach to his care (including surgery, pulmonology, and critical care) over 73 days of hospitalisation, the patient survived to discharge. The authors argue that trauma pneumonectomy is an exceptionally high-risk procedure with mortality approaching 100% due to post-operative pulmonary complications. However, with the adjunctive use of VV-ECMO to provide temporary pulmonary support and a coordinated multispecialty approach, survival is possible. They claim that VV-ECMO should be readily available and instituted emergently in patients undergoing trauma pneumonectomy who develop severe hypoxia or ARDS. In conclusion, the authors suggest that VV-ECMO following trauma pneumonectomy can allow time for pulmonary recovery and survival. With anticipation of postoperative pulmonary sequelae and a collaborative multidisciplinary management strategy, mortality from this morbid procedure may be reduced. This case report provides evidence that a patient can survive even an extended duration of VV-ECMO (37 days) following trauma pneumonectomy with the appropriate comprehensive medical support. This case report describes an exceptionally rare clinical scenario of survival following trauma pneumonectomy and extended VV-ECMO support. As the authors note, there are few published reports of successful outcomes in similar cases, so this manuscript could provide value in adding to the sparse literature on trauma pneumonectomy with adjunct ECMO. However, as a single case report, the generalizability and impact on clinical practice may be limited.

The main merits and strengths of this paper include the following:

1. It highlights a novel and complex clinical case that would be of interest to specialists in trauma surgery, thoracic surgery, critical care, and ECMO. The intricate medical management of this patient over 73 days could inform clinicians dealing with similar complicated postoperative courses.
2. It advocates for an aggressive, coordinated multidisciplinary approach using all available advanced therapies to optimize outcomes, even for moribund patients. The input of multiple subspecialists in this case was likely instrumental to the patient's survival.
3. It provides evidence that VV-ECMO, even for a prolonged duration, can be a lifesaving intervention following trauma pneumonectomy complicated by ARDS. The authors argue for early institution of VV-ECMO in these cases before severe hypoxemia develops. Their experience suggests temporary organ support with VV-ECMO should be readily available at centres performing emergency pneumonectomy.
4. It adds to the limited published literature on trauma pneumonectomy, which is a rare, high-acuity procedure. By documenting details of the medical and surgical management, as well as challenges encountered in this case, the report could guide management of future cases.

The novelty and complexity of this case, as well as the insightful discussion on anticipating and managing potential complications of trauma pneumonectomy, gives this manuscript merit for potential publication. The multidisciplinary nature of the patient's care and role of ECMO support in the setting of trauma pneumonectomy could

be of interest to various medical specialties. Overall, this paper seems a worthwhile addition to the literature, with opportunity to influence clinical practice at certain high-volume trauma and ECMO centres.

Response

Thank you for that comprehensive review and kind words of our manuscript. We have responded to your other comments below.

Comment

It would be beneficial to provide more details on the patient's history of present illness and past medical history, as well as any relevant social history or risk factors. The relatively little information currently given about the patient limits readers' understanding of the full clinical context.

Response

We agree with this point and have added details about his past medical history and the events immediately prior to his arrival in our trauma bay.

Changes in text

In lines 80-82 we have added “He was a previously healthy gentleman with no medical problems and no prior surgeries. Following his gunshot injury, he was transferred from the scene to the emergency room by transport.”

Comment

The authors may consider discussing potential mechanisms for the patient's complications and how each was addressed during management. For example, they could explain the aetiology of the bronchial stump defect, interventions done to stabilize it while on ECMO, and how the modified Y-stent was placed. Providing a pathophysiologic basis and technical details for key events in the case would increase educational value for specialists.

Response

We agree and have added details about the daily packing of the right chest to minimize the air leak. We have also added more details about the bronchoscopy and stent placement.

Changes in text

In lines 100-102 we have added “His right chest was packed with gauze and changed daily. The packing reduced the air leak to a minimal level and helped to stabilize his respiratory mechanics.” In lines 106-107 we have added “The stent was fashioned and placed by the pulmonology team to cover the entire right mainstem bronchial stump.”

Comment

It would be beneficial to expand the discussion of the relevant literature on trauma pneumonectomy and ECMO. A more comprehensive review of similar published cases and comparison of outcomes and interventions would strengthen the manuscript. Discussing mortality rates, common complications, and prognostic factors in greater depth would provide useful context for readers.

Response

Thank you for this comment. We have included a more complete literature review in the form of a table.

Changes in text

Please see addition of Table 1 and lines 125-132 on page 6.

Comment

It would be helpful to discuss the relevance and applicability of ECMO and multidisciplinary collaboration to other trauma centres. For example, the authors could comment on which resources and expertise would be necessary to replicate these interventions and outcomes. They could also discuss how smaller hospitals may need to transfer patients to higher-volume centres. Addressing implementation at different types of institutions could broaden the impact.

Response

Thank you for this comment. We addressed this in comment in an additional paragraph following our literature review.

Changes in text

Please see the additional text on pages 6-7 in lines 133-140.

Comment

The authors may consider discussing the financial and resource implications of prolonged ECMO, ICU care, and managing complications from a morbid procedure like trauma pneumonectomy. Addressing cost-effectiveness, resource utilization, and health economic aspects would provide important perspective for institutions developing similar critical care programs.

Response

Thank you for this comment. We included a brief description of cost for ICU and ECMO care, as well as our suggestions to centralize this service to best optimize a community's health economics.

Changes in text

Please see addition to text on page 7 lines 140-146.

Comment

The authors may consider discussing patient outcomes and follow up in more depth. They could comment on quality of life, functional status, disability, need for home oxygen, follow up procedures, etc. after discharge. This information would give the case report a more complete resolution.

Response

We agree and have added details about his long term course.

Changes in text

In lines 115-119 we have added "Six months after his gunshot injury, the patient had a myocutaneous flap placed to cover the defect from the thoracotomy wound. By this time the bronchopleural fistula had resolved and the stent was able to be removed. His tracheal device had been removed and he did not require supplemental oxygen. On follow up 1 year after the injury, the patient was living at home with continued care

from home nursing and physical therapy.”

Comment

The authors may consider discussing how the case report could impact patient care standards. For example, they could comment on indications for trauma pneumonectomy, use of ECMO in trauma, or multidisciplinary team structures for complex cases. Discussing implications for changes in clinical practice provides relevance.

Response

Thank you for this comment. We have addressed the potential to consider ECMO cannulation following trauma pneumonectomy as a treatment option to be quickly considered in the correct patient population.

Changes in text

Please see addition to text on page 8 lines 155-163.

Comment

The authors may consider discussing limitations in their approach to this case. Discussing limitations transparently would strengthen the analysis of this case. This can reassure readers that the limitations have been actively considered when drawing conclusions.

Response

We have added to the limitations to ensure that readers understand all of the mitigating circumstances.

Changes in text

In lines 174-177 we have added “This report is also limited by the development of a bronchopleural fistula secondary to mass stapling of the hilum without dissecting the individual hilar structures. The mass stapling was required to prevent exsanguination, but the fistula likely exacerbated his overall clinic condition.”

Comment

Lastly, the authors may consider changing the language to a more academic and professional tone for a wider audience. For example, they could change “saved only for extreme circumstances” to “reserved only for the most critical cases” and “sparse reports” to “limited published literature.” Ensuring the vocabulary is clear and concise would enhance the accessibility of the manuscript to readers of various backgrounds.

Response

Thank you for this comment. We have reviewed our paper for more academic language.

Changes in text

Please see changes to language throughout the paper.