

Peer Review File

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Reviewer A

Comment 1. Few grammatical errors within the text. See uploaded pdf file with comments for suggested alternatives.

Reply: The manuscript was reviewed, and grammatical corrections were made.

Comment 4. The videos are well put together to demonstrate some principals of the case. However, there is a quality issue with the videos that leaves the viewer desiring a higher quality video. I would highly recommend attempting a higher quality upload, perhaps to a different video hosting platform. In addition there is an error with the link to the first video: please add a space between the link text and "Abruzzini procedure".

Reply: New rendering was performed for both videos. Especially in the first video, a significant improvement was achieved.

Reviewer B

Comment 1. In general, the bronchopleural fistula with infection is hard to treat. Was the patient under control of infection? I think this procedure should not perform the patients who are not under the control of infection.

Reply: Certainly, a good control of the infection of the cavity is desirable before attempts to close the fistula. However, the fistula was too large, and we came to the conclusion that any attempt (ex. cleaning, thoracostomy reopening, etc) could be risky due to the high possibility of dripping of contaminated secretions to the healthy lung.

Changes in text: A statement regarding that a good control of the infection is advisable before the surgery – PAGE 4 – LINE 179: "It is recommended that any gross infection of the pleural cavity should be treated before the procedure. In that case, the big size of the fistula did not allow proper instillation of any kind of solution and, thus, it was decided to correct the fistula before any debridement or cleaning."

Comment 2. The authors showed the right side bronchopleural fistula. How about the left side fistula? The authors described that it might be hard to perform this procedure in terms of anatomical difficulty. Could you show the video of the left-side

procedure?

Reply: We have started using the rigid endoscope for this procedure in 2020 and, since then, we have performed three Abruzzini procedures. However, all of them were for right bronchopleural fistulas and, thus, we do not have the same kind of recording for left fistulas.

Comment 3. The condition of a bronchial stump (shape, length, color...) is very important. Could you show the postoperative bronchoscopic view? Time series showing is desirable.

Reply: The patient was submitted to endoscopical evaluation some weeks after the closure of the fistula. Unfortunately, the procedure was not recorded by the endoscopy staff. Considering that the patient is now completely asymptomatic, we have chosen to not submit her to another procedure just to do photo/video documentation of the stump conditions.

Reviewer C

General comment: If authors could revise or add the following, it would be worthy of acceptance.

- Line 75 – 77

"In the following years, after confirmation that there was no bronchopleural fistula using

bronchoscopy and tomographic evaluation, two attempts of thoracoplasty were done to close the thoracostomy."

Reply: This line was added with a small change. In fact, two sequential procedures to close the thoracostomy, one of them being a thoracoplasty, were done. The details of both are in the next sentence.

Changes in text: PAGE 4 – LINE 113 - "In the following years, after confirmation that there was no bronchopleural fistula using bronchoscopy and tomographic evaluation, two procedures were done to close the thoracostomy."

- The authors confirmed that the BPF was closed, and two attempts of thoracoplasty were performed. However, the BPF has recurred.

Also, can the authors briefly explain the details of the two attempts of thoracoplasty?

Reply: A brief explanation of both procedures was added.

Changes in text: PAGE 4 – LINE 109 - "In the following years, after confirmation

that there was no bronchopleural fistula using bronchoscopy and tomographic evaluation, two procedures were done to close the thoracostomy. First, the previous thoracostomy was progressively closing and, so, it was widened to allow proper irrigation of the cavity. After ensuring proper cleaning in the following months, 4 ribs were resected, and a muscle flap was harvested to perform a thoracoplasty. Unfortunately, this strategy was unsuccessful due to recurrence of the infection and the thoracostomy had to be reopened in 2016."

- Also, how did the authors insert this drain tube? Although the drainage in the pathway in the video seems difficult, the authors have placed a drainage tube in the appropriate location.

Reply: When the patient decided that she did not want to be submitted to further procedures, and considering that the thoracostomy had spontaneously closed in the past, we decided to leave a small-bore chest tube to guide the drainage of the fluids.. Especially because the patient did not attend regularly to the outpatient clinic consultations. Some months later, the thoracostomy closed around the chest tube.

Changes in text: PAGE 4 – LINE 115 - "At that point, the patient decided that she did not want to be submitted to further procedures. Anticipating that the thoracostomy would spontaneously close again, a small-bore chest tube was left in the pleural cavity to guide the drainage of the cavity secretions. During the following years, the patient did not attend to regular consultations and the thoracostomy gradually closed around the chest tube as seen in the Video 1. "

- Line 82 - 85

"In May 2021, the patient presented in the outpatient clinic with dyspnea with minimal

exertion. A bronchoscopy was performed and showed that a large bronchopleural fistula had developed. A transsternal transpericardial approach to close the bronchopleural was done, and the technique is described below."

I imagined that the cause of this dyspnea with minimal exertion was due to contralateral pneumonia. (Even CT appears to show a mild infiltrative shadow.)

How long was the waiting period between this outpatient visit and the surgery?

Moreover, with a BPF this large, I am very concerned about sputum and other secretions dripping into the contralateral side during the procedure. Have the authors told the anesthesiologist to ensure frequent bronchial suctioning?

Reply: The exertion was attributed to the huge air flow that was going through the fistula and not to the contralateral lung. The day following the surgery the patient was

already reporting a decrease on the dyspnea. The day before the surgery we had a briefing with the anesthesiologist to plan the whole procedure and avoid any contaminations or ventilation issues with the left lung.

Changes in text: A section was added and reassured the need of frequent suctioning and to plan the procedure with the anesthesiologist. – PAGE 5 – LINE 205 - "The anesthesiologist should be instructed to regularly suction the airways to avoid dripping of any secretions to the healthy side. It is also recommended to previously discuss the intubation strategy with anesthesiologists to align on the procedure needs."

- Line189-191

"Finally, the removal or closure of the distal (remaining) bronchial stump is crucial to achieve a successful closure of the fistula, with no postoperative infection or recurrence."

In this case, the authors could not remove it due to strong adhesion, which is enormously understandable. However, the postoperative infection is worrisome.

Are there any measures that can be taken to prevent infection when a distal bronchial segment is left behind, such as antibiotic administration?

Reply: Some authors previously reported that the cauterization of the bronchial mucosa to decrease the mucus production could mitigate the risk of infection. We are not aware if there are any consensus on the use of antibiotics, since one the premises to use the transpericardial approach is to close the stump through an area free of previous contamination. We did not use antibiotics in this case.

Changes in text: LINE 304 – PAGE 8 - A paragraph was added to the Comments section as follows: "If the bronchial stump cannot be removed, it should be closed, and the patient should be carefully monitored for mediastinal infections. Obliteration of the mucosa of the remaining stump using cauterization/electrocoagulation has been reported by some authors to avoid mucous production.(2) Antibiotics may be used in this scenario, but it lacks further proof of its benefits."

Comment: I think the URL for Video 1 in the text is incorrect. The video could not be verified, and I received a new URL from the EDITORIAL OFFICE.

Reply: The video was uploaded again and the link is in this new version.

Reviewer D

Comment 1: Please review and revise for English language, spelling and grammar as manuscript readability is significantly impacted in its current form.

Reply: The manuscript was reviewed, and grammatical corrections were made.

Comment 2: Figure 1 does not contribute significant information about performing the Abruzzini procedure. The figure adds a position for a camera assistant and monitors at head of surgical bed which is fairly self explanatory. If the intention was to highlight the use of intraoperative video assessment, then the video bronchoscope set up should be included as well. Overall, would recommend utilizing this space in some other way such as a figure depicting the critical surgical exposure, interesting clinical imaging from patient described in manuscript or table summarizing published experience with Abruzzini procedure.

Reply: The figure was deleted following the recommendation.

Comment 3: Can the authors discuss the advantage of using an endoscope as opposed to a headcam? The recommendation to utilize video during surgery is absolutely valid and so discussion of additional camera options is warranted to increase generalizability.

Reply: The bronchial stump through this approach is in a small and deep area therefore the headcam would not provide, in our opinion, the level of detail that we needed for those in the room when compared to the rigid endoscope.

Changes in the text: A line was added, citing the advantages of the rigid endoscope in this particular case. Page 8 – LINE 292.

Comment 4: How did the two attempts at closure of open window thoracostomy fail? This information is pertinent as the use of muscle flaps and hostile mediastinum are indications for consideration of transsternal, transpericardial closure of BPF (Abruzzini procedure).

Reply: A brief explanation of the attempt to close the thoracostomy was added.

Changes in text: PAGE 4 – LINE 109 - "In the following years, after confirmation that there was no bronchopleural fistula using bronchoscopy and tomographic evaluation, two procedures were done to close the thoracostomy. First, the previous thoracostomy was progressively closing and, so, it was widened to allow proper clean of the cavity. After ensuring proper cleaning in the following months, 4 ribs were resected, and a muscle flap was harvested to perform a thoracoplasty. Unfortunately, this strategy was unsuccessful due to recurrence of the infection and the thoracostomy had to be reopened in 2016."

Comment 5: Unfortunately, I was unable to open video 1 for review and so am unable to comment.

Reply: The video was uploaded again and the link is in this new version.

Comment 6: Control of the pleural infection should be described at some point in the manuscript as this is an essential part of the overall management of a patient with post-pneumonectomy bronchopleural fistula as those patients will by definition have an empyema. Did the patient in this report continue to have a small bore chest tube in her right post-pneumonectomy pleural space?

Reply: After the procedure the thoracostomy was reopened and the cavity was debrided. For two weeks, pleural irrigation with saline solution was done twice daily until good control of the infection was achieved and then the thoracostomy was closed in a similar fashion to a Clagett procedure.

Changes in text: A paragraph detailing the postoperative management of the pleural cavity was added to the text. PAGE 9 – LINE 312: " After the closure of the fistula, the remaining pleural cavity should be treated with thoracoplasty or other techniques with the same purpose. For this patient, a thoracostomy was reopened on the site of the small-bore chest tube one week after the Abruzzini procedure and debridement was performed. For two weeks, daily irrigation with saline solution was done and then it was closed after filling the pleural cavity with antibiotic solution.

Comment 7-Recommend increasing speed to 1.25 or 1.5x

Reply: The speed was increased to 1.2x. Some sections were increased up to 1.5x.

Comment 8-At time of TA stapler clamp/closure, recommend pausing video to allow viewers to appreciate the bronchoscopic appearance of airway as described in the text (line 159-162). It is challenging to look back and forth between the two videos (endoscope video and bronchoscope video) simultaneously

Reply: A pause was done at this moment and some annotations were added to ensure a better understanding.

Comment 9: Recommend adding text to the video to indicate when the 1) RPA is being ligated and 2) distal stump being closed. This may not be immediately obvious to some viewers.

Reply: Both annotations were added to the video.