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Reviewer Comments

I think there are good points made regarding the use of NIV in during bronchoscopy, but there are some significant issues that I feel need clarification.

Dear Sir or Madam,

We are most grateful for your opinion about the clinical significance of the topic provided and we would like to thank you for your comments. Below you will find a point-by-point reply to all your comments and suggestions. All the changes made have been highlighted in the attached revised version of the manuscript.

Comment 1. In line 77-78: "RB is performed in the operating theatre under general anesthesia by an expert team and is safer than not assisted FB in terms of RF risk." In line 83: "However, the risks and benefits seem to favor FB, at least in less severe cases." These two statements seem contradictory regarding risks and benefits of FB vs RB. How do you reconcile them?

Reply 1: *Dear Reviewer thank you for revealing a part in the text which sound not clear enough. RB is an invasive method which facilitates ventilation throughout the entire procedure, whereas FB generally worsens patients ventilation, that is why in standard FB non invasive oxygenation techniques are used to prevent hypoxemia. We hope that the revised part of the paper could made clearer the explanation of our statement given between cited lines 78 and 83, where we had written "The risks and complications of RB are mainly mechanical (teeth, oropharynx, vocal cords, and bronchial injuries) or less frequently, caused by anesthesiology procedures. Due to slightly different indications and team requirements, it is difficult to compare the risks and benefits of RB and FB in the management of tracheostomy complications."*

Changes in the text 1: We have added text is written in red (lines 78-88): The risks and complications of RB are mainly mechanical (teeth, oropharynx, vocal cords, and bronchial injuries) or less frequently, caused by anesthesiology procedures. Conversely, FB may be complicated by respiratory failure exacerbation, which is

usually caused by airway narrowing, profound sedation and only rarely mechanical injury. That is why RB is usually preferred over FB when tracheal inspection is likely to be followed by interventional endoscopic procedures. However, the choice of one over the other bronchoscopic technique should be carefully tailored to the risk-benefit balance assessment in each case; in the contest of a fragile critical patient poorly candidate to recure again to advanced ICU care, it's worth considering the feasibility and safety of a less invasive strategy based on the use of FB under appropriate non invasive respiratory assistance for the management of tracheostomy complications.

Comment 2. Line 120-122: "Taking into account the patient's age and acute deterioration, it was speculated that the ACRF was probably caused by accidental food aspiration." The entire point of your manuscript is that NIV-assisted bronchoscopy is a safe intervention; however, the proximity of this complication to the procedure is certainly suspicious, especially as NIV can cause gastric distension and increase the risk of aspiration. Can you comment on this as a potential risk? How would you mitigate this risk?

Reply 2: *Thank you for your comment that allow us to better explain this point. The reviewer is right in considering gastric distension as a relatively frequent complication of NIV. However, it's likely to occur after prolonged NIV sessions in high-risk patients (ie. mandatory supine decubitus, pre-existent oesophageal-gastro-intestinal diseases, drug use that reduces gastroenteric motility). In the case reported NIV was applied only for short time aiming at support FB procedure. As matter of the fact, post-procedural deterioration of respiratory condition without physical signs of abdomen distension should be attributed to other unpredictable causes.*

Changes in the text 2: Changes in the text lines 129-140 are highlighted in red

However, several hours later the patient's clinical condition deteriorated rapidly due to unexpected RF exacerbation and the patient required urgent intubation, transfer to ICU and urgent laryngological management, during which no additional artificial bodies were witnessed. Unfortunately, after 8 days of treatment in the ICU the patient died due to cardiac arrest in mechanism of asystole. Histological examination revealed bone tissue. Taking into account the patient's age and acute deterioration, it was speculated that the ACRF responsible for current hospital admission was probably caused by accidental food aspiration which have taken place before described hospitalization. We could reasonably speculate post-procedural

deterioration of respiratory condition without physical signs of abdomen distension should be attributed to other unpredictable causes. Even if gastric distension is a relatively frequent complication of NIV, it's likely to occur after prolonged NIV sessions in high-risk patients (ie. mandatory supine decubitus, pre-existent oesophageal-gastro-intestinal diseases, drug use that reduces gastroenteric motility.

Comment 3. Lines 167-169: "An additional and very important novelty of our study is the role of NIV-FB in the diagnosis and management of this type of post-tracheostomy complication." This sentence seems out of place in the context of the paragraph. It seems like a stem for a separate paragraph focused on the role of NIV-FB.

Reply 3: *We do agree that the sentence as accidently found at the beginning of the discussion a bit out of place taking this into account, we have moved this important statement, to a more accurate part of the discussion. According to Reviewers suggestion, we have built up an technical explanation in lines*

Changes in the text 3: Changes in the text are highlighted in red

An additional and very important novelty of our study is the role of NIV-FB in the diagnosis and management of this type of post-tracheostomy complication" was moved into lines 229-230. Moreover, we have added following technical explanation in lines 246-251: To facilitate NIV-FB in both patient we have used our standard strategy, which is to begin with EPAP settled at the level of 6-8 cmH_2O and subsequently adjust EPAP pressure based on patients clinical status and observed vital and respiratory parameters but keeping the EPAP $\leq$14 cmH_2O which together with inspiratory time <1s decreases the risk of gastric distension but facilitates sufficient alveolar recrutation (Skoczyński S, Ogonowski M, Tobiczyk E, et al. Risk factors of complications during noninvasive mechanical ventilation -assisted flexible bronchoscopy. Adv Med Sci. 2021;66:246-253. doi: 10.1016/j.advms.2021.04.001.).

Comment 4. You mention mechanical complications of rigid bronchoscopy, but foreign body removal through the vocal cords would also have possible mechanical complications including vocal cord and airway trauma, which during rigid bronchoscopy are mitigated by use of a controlled airway and more agile tools. I would be particularly concerned with removing ossified tracheal cartilage through the

natural cords as this can be quite sharp. Can you comment on the balance of these risks?

Reply 4: *Thank you for this weary important comment. We do agree that a rigid bronchoscopy creating controlled airway would be method of choice in such clinical condition. However during patient treatment in was not expected to find tracheal narrowing partially caused by a foreign body. During NIV-FB the foreign body which was found was separated into small parts which looked safe for removal, but created a significant risk of transposition and closing of adjacent post intubation tracheal stenosis (Figure 1). Therefore considering stabile ventilation during NIV-FB we have attempted to clear the trachea to the maximum possible extent. Our case series is a clinical example but not randomized clinical trial, therefore the level of scientific message should not be used to create a new treatment standard, but may be used in some centers with limited access to rigid bronchoscopy.*

Changes in the text 4: Changes in the text are highlighted in red

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Based on Reviewers suggestion we have modified manuscript discussion and conclusions to avoid readers confusion we have added following explanation in th discussion (lines 260-268):

In our cases, we did not expect to find tracheal narrowing partially caused by a foreign body. During NIV-FB the foreign body was separated into small parts which looked safe for removal, but created a significant risk of transposition and closing of adjacent post intubation tracheal stenosis (Figure 1). Therefore considering stabile ventilation during NIV-FB we were successful to clear the trachea to the maximum possible extent. Our case series show in a clinical ground potential rescue solution in unpredicted circumstances occurring in fragile critical patients who are poor candidates to advanced invasive treatment, especially in centers with limited access to rigid bronchoscopy. This does not mean that NIV-FB represents the golden standard strategy to manage life-threatening foreign body removal.

in conclusion (lines 274-276): ,however RB should be available to perform safely interventional procedures under assisted ventilation and full airway control.

Dear Reviewer

Thank you very much for all of your comments, which I find very relevant and

useful. All the changes made have been highlighted in the attached revised version of the manuscript. Once again thank you for spending your valuable time reviewing our text. We are glad to know that the Reviewer shares our opinion that this topic is clinically relevant and hope that the corrected text will be acceptable now for publication in The Annals of Palliative Medicine.

Sincerely Yours,

Szymon Skoczyński on behalf of all authors