



CASE REPORT

False perception of esophageal intubation as a result of complete obstruction of the endotracheal tube by retained mucus following a period of failed non invasive ventilation in a case of acute transverse myelitis

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One of the most common risk factors in predicting the non invasive ventilation failure is inability of the patient to handle tracheal secretions [1]. Although; retained secretions may occlude endotracheal tube and causes the complete airway obstruction [2]. We are presenting a case of complete ETT occlusion by mucus plug following a period of NIV which was initially misdiagnosed as esophageal intubation.

Case report

An 18 year old girl was admitted in the ICU, she was intubated because of sudden onset left sided weakness followed by respiratory distress 12 h before hospital admission. Cervical MRI showed a long hypersignal lesion in T2 images (Fig. 1). She was on the mechanical ventilation for the first 2 days of ICU stay but because of self extubation and acceptable oxygenation, she went on NIV because of moderate hypercarbia

(PaCO₂ = 55 mmHg) and tolerated it for 2 days after which she had complaint of dyspnea. So portable chest X-ray was done which showed left lower lobe collapse (Fig. 2). We decided to intubate her for relieving respiratory distress. Thus, she received sedation with fentanyl and intubated with ETT size ID = 7, but chest rise was not detectable and there was no audible breathing sounds over the anterior chest wall while there was no gurgling sound over the epigastric area on auscultation.

It was not possible to ventilate the patient either with mechanical ventilation or manually by bag and mask through the ETT. There was also no detectable CO₂ on capnography. So, ETT was removed with the impression of possible esophageal intubation and after manual ventilation with bag and mask which was without any difficulty another attempt was done. For the second time while there was grade I of laryngoscopic view and easy pass of the tube into the trachea, it was not possible to ventilate the patient and there was no capnographic waveform again. With the suspicion of occluded ETT by mucus plug, suctioning was done through the ETT instead of removing the tube and a lot of thick purulent secretions were drained. Fortunately, it was possible to ventilate the patient and capnographic waveform showed acceptable end tidal value. There was no decrease in SPO₂ below 90% or any hemodynamic deterioration during the three attempts of intubation.

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Figure 1 Cervical cord demonstrated normal cranial junction and width and areas of high signal intensity on T2WI in central part.



Figure 2 A-P portable chest-X-ray showing left lower lobe collapse.

Discussion

We selected NIV in this case to avoid reintubation while we were aware of inability of the patient to handle the tracheal secretions because of the diaphragmatic involvement in the disease process. From our point of view NIV was a good choice for her because she was immunosuppressed due to the methylprednisolone pulse therapy for myelitis. Poor cough reflex in this patient caused NIV failure, so we decided to start invasive ventilation. ETT occlusion at the time of intubation by the mucus has been previously reported by Zar et al. [2]. In their case, there was unilateral obstruction in ETT because a large

amount of mucus plug was adherent to the end of the endotracheal tube.

On the other hand one of the most common factors in NIV failure is inability to handle tracheal secretions [1]. In this case it seems that we underestimated the amount of retained secretions due to the acceptable arterial blood gas without any rise in PaCO₂. Even at the time of intubation the arterial blood gas was normal.

According to the review of the literature, there may be significant deterioration in ventilation in the case of failure of NIV and we should be ready to handle these issues as Wood et al. have reported the development of life-threatening inspissated secretions precipitating airway obstruction as a consequence of prolonged noninvasive ventilation [3].

We should consider the limitation of capnography when there is cessation of gas flow as in the case of complete airway obstruction. We should also consider the problems of the mucus retention in patients who have no strong cough reflex while they are on NIV.

We did not use fibroptic bronchoscopy for documenting the endotracheal tube position but it was possible to avoid the removal of the correctly positioned ETT if FOB was available immediately at the bedside.

Conclusion

Retained secretions may be problematic in the course of a failed NIV and should be considered as an important cause of NIV failure and approached timely to prevent any emergent ventilation event. While, complete airway obstruction may cause false perception of esophageal intubation because capnography may not detect any end tidal CO₂. Fibroptic view of trachea may help to verify the correct position of the ETT in such cases.

Conflict of interest

None declared.

References

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