

Tracheal crusting: A rare but fatal complication of Endotracheal Intubation

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Author's Contribution

¹ Writing case report

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³ literature review and consent

⁴⁻⁵ Referencing, review

Article Info.

Conflict of interest: Nil

Funding Sources: Nil

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Cite this article as Kaleem M, Wali H, Ansari SS, Haseeb S, N, Javed N. Tracheal crusting- a rare but fatal complication of endotracheal intubation: A case report. *JSTMU*. 2022; 5(2):121-123.

A B S T R A C T

Endotracheal intubation is an intervention frequently performed in the hospital setting in order to protect the central airway and provide mechanical support for ventilation. The complications of the endotracheal tube include tracheitis, tracheal stenosis, tracheomalacia, and granuloma formation. Tracheal crusting following tracheitis is a very rare but fatal complication of endotracheal intubation especially in children so bronchoscopy should be compulsory in patients who have difficulty being weaned off from the ventilator and tracheal crusting should be kept in mind as a differential for weaning failure. Several cases of tracheal stenosis after extubation have been reported. However, to the best of our knowledge, there are no cases of obstructive tracheal crusting in children following tracheitis in the current literature. Here, we present the case of a 1-year-old girl who developed complications as a result of intubation.

Keywords: Tracheal crusting, Tracheitis, Endotracheal incubation

Introduction

Endotracheal intubation is a life-saving procedure. But it is associated with many complications such as tracheal stenosis, tracheomalacia, or granuloma formation.¹ Some of these complications can result in extubation failure, which occurs in 5 to 10% of patients intubated in ICU and is associated with a 25 - 50% increase in mortality rate.² Causes include all etiologies of airway obstruction, such as laryngospasm, upper airway edema, bleeding either leading to hematoma compressing the airway externally or clots internally obstructing the airway, accumulation of respiratory secretions, tracheal collapse due to tracheomalacia, and upper airway soft tissue collapse secondary to the effects of anesthetics, opioids, and muscle relaxants.³ Airway obstruction most commonly presents as stridor which is resolved upon reintubation. Tracheal crusting is an uncommon complication of

prolonged intubation and when it has been previously reported in the literature, growth of candida was seen.⁴

Case report

A 1-year-old girl was brought to the ER due to non-bilious vomiting and constipation for five days. After her workup, she was diagnosed with a case of bowel obstruction. Due to the failure of conservative management, the patient underwent exploratory laparotomy. The procedure was successful however upon extubation the patient could not be ventilated properly and had to be reintubated. After re-intubation, her oxygen saturation was maintained at 92%. Further vitals revealed a heart rate of 140 bpm and blood pressure of 80/30 mmHg. A physical exam performed at that point revealed harsh vesicular breathing on auscultation. Multiple

attempts were made to wean her off ventilator support but she could not maintain adequate oxygen saturation levels. After 9 days on ventilator support, she was weaned off successfully and her oxygen saturation was maintained at 90% on 3 liters of oxygen via the nasal cannula. After 48 hours of extubation, the patient developed tachypnea, and oxygen saturation levels fluctuated between 80-85%. Imaging studies were performed, which showed no mass in the post-cricoid region and no other concerning focal lesion however, web-like projections originating from the right glottic and supraglottic region lateral wall extending into the lumen were visualized on the lung window suggesting the presence of tracheal webs due to sequelae of long term endotracheal intubation.

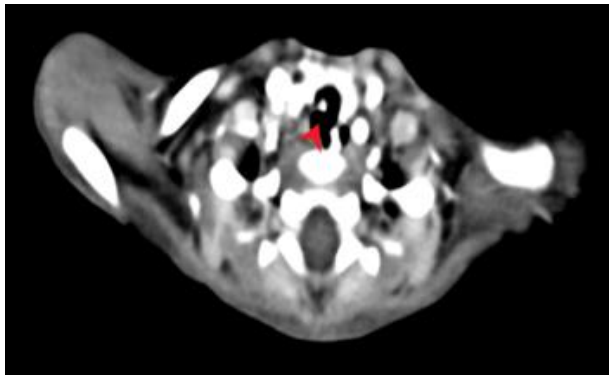


Figure 1: CT Angiogram

After the patient's vitals failed to improve, she was taken for bronchoscopy 12 days after laparotomy, which showed saddle-shaped crusting present in the distal end of the trachea. There was no other tracheal web or stenosis present. The crust was removed and pus was cleared and sent for culture and sensitivity. The tracheal culture revealed the presence of *Stenotrophomonas maltophilia*. The patient was started on ceftazidime. The patient's condition improved significantly following the course of antibiotics. She was discharged home with the advice of chest physiotherapy and follow-up.

Discussion

Tracheal crusting is a common complication of tracheostomy but rarely has it been reported as a complication of prolonged endotracheal intubation that presented as a cause of extubation failure. A common complication of prolonged endotracheal intubation is the formation of an obstructive pseudo membrane that occurs

due to local trauma at the site of the endotracheal crust, with no known predisposing factor or illness associated with it.⁵ The pathophysiology is thought to be due to reduced tracheal mucosal perfusion causing ischemia and ulceration in the trachea.⁵ Most cases present with respiratory distress, stridor, or hoarseness of voice that can occur from a few hours to days of extubation.⁶ Several cases of tracheal stenosis after extubation have been reported. However, to the best of our knowledge, there are no cases of obstructive tracheal crusting in children following tracheitis in the current literature. Our case report is unique as it not only reports tracheal crusting as a cause of respiratory obstruction but also our report showed the growth of *Stenotrophomonas maltophilia*. It is a multi-drug-resistant bacteria that is responsible for nosocomial infections. It can form biofilms on human bronchial epithelial cells.⁷ It can cause hospital-acquired pneumonia in ICU patients. Our patient follows this trend as she also had asymptomatic colonization of *Stenotrophomonas maltophilia*. Tracheal crusting following tracheitis is a very rare but fatal complication of endotracheal intubation so bronchoscopy should be performed in patients who have signs of respiratory distress after extubation.

Conclusion

Tracheal crusting should be in consideration, especially in children who show signs of airway obstruction following endotracheal intubation. Early detection of tracheal crusting and immediate action can reduce the morbidity and mortality associated with prolonged intubation. Tracheal crusting following tracheitis is a very rare but fatal complication of endotracheal intubation so bronchoscopy should be performed in patients who have signs of respiratory distress after extubation. Since infection with *S. maltophilia* can be life-threatening, care should be taken to make the correct diagnosis and prevent resistant strains from emerging in patients being treated with antibiotics for various reasons. Strict adherence to hygiene and quality control can also help reduce nosocomial infections in susceptible patients.

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