

## Case Report

# Obstructive Tracheal Pseudomembrane

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Obstructive tracheal pseudomembrane is a rare complication of endotracheal intubation, which could cause fatal airway obstruction following extubation. Hereby, we reported a patient who had only undergone a short course of intubation for a laparoscopic cholecystectomy and developed progressive respiratory distress after extubation.

**Keywords:** Airway obstruction, Stenosis, Tracheal pseudomembrane

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**Introduction**

Obstructive tracheal pseudomembrane is a rare complication of endotracheal intubation. It is a dried semisolid fibrinoid material, which could cause airway obstruction following extubation. The exact mechanism of its development has not yet been described.<sup>1</sup>

The patients usually present with dyspnea and stridor a couple of hours to several days after extubation. Although most patients have experienced prolonged intubation, some reported cases have only had a brief period of intubation for a surgical procedure.<sup>2</sup> High index of suspicion and prompt rigid bronchoscopy by a surgeon expert in the field of airway surgery could be both diagnostic and lifesaving.<sup>1-3</sup> Here, we report a patient who underwent endotracheal intubation for cholecystectomy and was referred to us with respiratory distress.

**Case Report**

A 43-year-old woman was referred to us 9 days after her laparoscopic cholecystectomy at an out-site hospital with a progressive dyspnea since her discharge. She did not report any postoperative complication or symptom regarding her abdominal surgery. The surgeon and anesthesiologist operating room notes also reported straightforward anesthesia and surgery without any complication such as difficult intubation during the time of surgical procedure. She had past medical history of diabetes, hypertension and hyperlipidemia. On physical examination, she was in respiratory distress with audible stridor. She was taken to the operating room and fiberoptic laryngobronchoscopy was performed with moderate intravenous sedation. The vocal cords anatomy and function were found

normal; however, through the vocal cords and during spontaneous respiration, subglottic stenosis with near complete obstruction was seen (Figure 1). The fibroscope was then removed and the patient underwent general anesthesia and rigid bronchoscopy was performed. There was a subglottic mass just below the vocal cords adherent to the tracheal wall, which was easily and completely cored-out by a rotating maneuver of rigid scope. The rest of the airway was normal except for mild subglottic mucosal inflammation and post stenosis secretions. The mass was a small (about 1.5 cm) irregular white gray pseudomembrane like tissue with rubbery consistency (Figure 2).

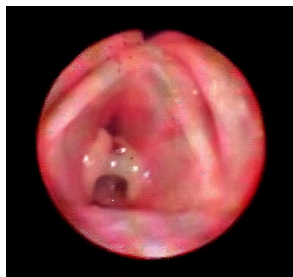
On histological examination, it was mostly fibrin strands mixed with aggregation of polymorph nuclear cells and sheets of slightly atypical metaplastic squamous epithelial cells.

The patient's symptoms improved immediately after the bronchoscopic procedure. At follow-up one month after surgery, the patient was asymptomatic and fiberoptic bronchoscopy showed no tracheal stenosis.

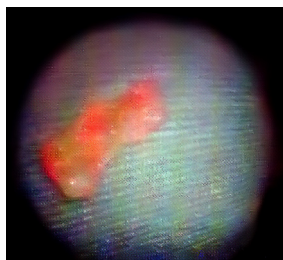
**Discussion**

Tracheal pseudomembrane has been long known as a complication of some upper airway infections like diphtheria. However, post-intubation tracheal pseudomembrane formation, known as Obstructive Fibrinous Tracheal Pseudomembrane (OFTP) in the literature, was first reported by Sigrist et al in 1981 in two tracheotomized patients.<sup>4</sup> It is a dried semisolid tubular like material, which could act as a check valve and cause fatal airway obstruction.

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**Figure 1.** Subglottic Stenosis With Pseudomembrane.



**Figure 2.** Tracheal Pseudomembrane Statement.

The exact mechanism of its formation is unclear.<sup>1</sup> As most of the reported patients had undergone several days of intubation, it was postulated that it might be an early phase of post-intubation tracheal stenosis, caused by the cuff pressure and resultant tracheal mucosal ischemia.<sup>5</sup> However, in some cases, it appeared to result from direct mucosal injury secondary to forceful and traumatic intubation.<sup>3</sup> Some other causes such as bacterial, viral, and fungal infections, as well as acid reflux have also been mentioned.<sup>6</sup>

In our case, there was no symptom or sign of infection and no history of prolonged intubation. Therefore, we believe it could be due to traumatic intubation (although it was not stated in the anesthesiologist's note), because the short intubation time would not put the tracheal mucosa at risk of ischemia even if the cuff pressure was mistakenly high.

Because there are several more frequent reasons for dyspnea and stridor after extubation, such as laryngospasm, laryngeal edema and retention of secretions than obstructive pseudomembrane,<sup>5</sup> we must have a high index of suspicion so as not to miss this potentially fatal condition.

In case of any clinical suspicion, it is better to start with fiberoptic bronchoscopy to first rule out any laryngeal edema or paralysis and then check for other causes of airway stenosis. If any obstructive lesion is seen, we prefer to switch to rigid bronchoscopy under general anesthesia for safe and rapid removal of the lesion, while the airway is kept open and ventilated.

Because this lesion may represent the early phase of post-intubation tracheal stenosis, a follow-up bronchoscopy after 1 month is recommended to rule-out any tracheal stenosis.

In conclusion, obstructive tracheal pseudomembrane should be considered as differential diagnosis in any patient with even a short course of endotracheal intubation, who develops post-extubation dyspnea and stridor. It is a potentially life-threatening complication which should be emergently managed by rigid bronchoscopy.

#### Conflict of Interest Disclosures

The authors have no conflicts of interest.

#### Ethical Statement

An informed consent form was signed by the patient. She also agreed to the publication of this case.

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