

Obstructive fibrinous tracheal pseudomembrane following tracheal stent placement: An underrecognized entity

Sir,

Self-expanding metallic stent (SEMS) placement is usually performed as a palliative measure for providing relief from symptoms of malignant central airway obstruction.^[1] Commonly associated complications with SEMS placement are excessive tracheobronchial secretions, stent occlusion, stent migration, granulation tissue formation, and stent fracture.^[1,2] Herein, we describe a case of obstructive fibrinous tracheal pseudomembrane (OFTP) complicating SEMS placement and the use of flexible cryoprobe in its management.

A 65-year-old female had presented to the gastroenterology outpatient services with the complaints of dysphagia and weight loss for 3 months. On evaluation, she was diagnosed as squamous cell carcinoma of the esophagus. Because of shortness of breath and noisy breathing, she was referred to the pulmonary medicine services for further management. On examination, she had tachycardia and tachypnea, and oxygen saturation at room air was 90%. Computed tomography (CT) scan of the thorax demonstrated a large esophageal mass with tracheal compression. Flexible bronchoscopy demonstrated infiltration of the posterior wall in the mid-trachea, causing around 80% luminal narrowing [Figure 1a]. Because of malignant central airway obstruction, a straight tracheal SEMS (18 mm × 60 mm) was deployed in the trachea using a rigid bronchoscope under general anesthesia. Postprocedure, she was shifted to the intensive care unit with an endotracheal tube in place and was extubated after 4 h. She had marked improvement in her dyspnea and stridor. She was educated about poststent care in the form of saline and bronchodilator nebulization along with chest physiotherapy and was discharged the next day. She again presented to the emergency department after 2 days with stridor and worsening breathlessness. Urgent flexible bronchoscopy

was performed under local anesthesia. Tracheal SEMS was seen *in situ* covered by a thick pseudomembrane causing near-complete occlusion in the proximal part of the SEMS, causing an obstruction [Figure 1b]. Given impending respiratory arrest, immediate removal of the membranes was planned. Initially, it was attempted using flexible forceps, but the attempt was unsuccessful as membranes were densely adherent. Subsequently, it was decided to use a flexible cryoprobe (1.9 mm, ERBE, Germany) for membrane removal. The procedure was performed under conscious sedation using a combination of midazolam and fentanyl. Piecemeal removal of the membrane was done, and recanalization of the trachea was achieved [Figure 1c]. The patient had marked symptomatic improvement and was discharged from the hospital the following day. Histopathological examination of the removed tissue demonstrated predominantly fibrin content along with necrotic tissue, confirming the diagnosis of OFTP [Figure 2].

OFTP is a potentially fatal and poorly recognized complication associated with the placement of artificial airway.^[3] It usually develops after endotracheal intubation of short duration. Shortly after extubation, partial detachment of the pseudomembrane can induce stridor or acute respiratory failure due to a valve-like tracheal obstruction.^[4] The duration between extubation and symptom onset may vary from 1 h to 15 days.^[5] The condition presents clinically as stridor or respiratory insufficiency after extubation. The common differential diagnoses in this situation include laryngeal edema, vocal cord palsy, or tracheal stenosis. However, OFTP should also be kept as a differential diagnosis in patients presenting with stridor soon following extubation or airway interventional procedures, such as stent placement.^[6,7] Pathological analysis has shown that the pseudomembrane consists of fibrinous material admixed with neutrophilic

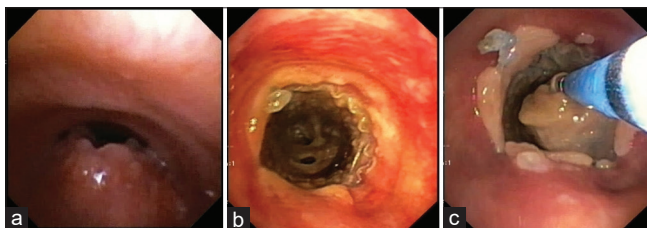


Figure 1: Flexible bronchoscopic view. (a) Posterior tracheal wall infiltration causing central airway obstruction, (b) formation of obstructive fibrinous tracheal pseudomembrane, (c) removal of obstructive fibrinous tracheal pseudomembrane using a flexible cryoprobe

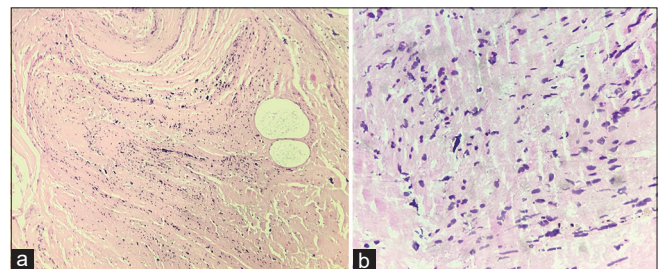


Figure 2: Microphotograph (H and E) of the pseudomembrane showing fibrin and necrosis in low power (panel a) and high magnification (panel b)

granulocytes and necrotic epithelial cells, with no evidence of subepithelial involvement.^[6] Emergent removal of the membranes by rigid bronchoscopy or reintubation for establishing a definite airway is regarded as the standard first-line treatment. Rigid bronchoscopy is accepted as the standard therapy, but flexible bronchoscopy is used in almost one-third of cases.^[9] The use of a rigid bronchoscope allows for rapid detachment of the pseudomembrane from the trachea while safely maintaining a patent airway. The partial detachment of the proximal pseudomembrane during the procedure can induce life-threatening acute respiratory failure due to tracheal obstruction.

The use of cryoprobe for extraction of the pseudomembrane has been reported previously.^[9] The use of cryoprobe helps in better and faster removal as it can remove a larger quantity of tissue than conventional forceps. We performed cryoextraction of the pseudomembrane under conscious sedation without establishing an artificial airway. This approach has an inherent risk of cold injury to vocal cords and subglottic mucosa. Endotracheal intubation to establish definite airway or rigid bronchoscopy is a safer modality, although it may not be available in emergencies in most settings.

To summarize, this case describes the occurrence of an uncommon complication in the form of OFTP formation after tracheal SEMS placement. This complication needs to be understood and recognized early for prompt management as delay in treatment may be fatal. Cryotherapy is a useful tool in the management of such cases though it should be used carefully, avoiding further airway injury.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflict of interest.

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