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Case Report

Delayed bronchial obstruction following esophageal stent placement: A case report and review of the literature ☆

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ABSTRACT

Esophageal adenocarcinoma typically has a poor prognosis at the time of diagnosis. Consequently, palliation of symptoms is vital to disease management with a cornerstone for palliation being esophageal stent placement. Esophageal stents are associated with a variety of complications that may present immediately or long after stent placement is completed. In this report, we present a 58-year-old male who developed shortness of breath 4 months after metallic esophageal stent placement. After further evaluation with a chest radiograph and CT angiogram of the chest, the patient was found to have obstruction of the left mainstem bronchus secondary to mass effect from the esophageal stent. Airway compromise secondary to metallic esophageal stent placement typically occurs immediately after placement of the stent. There are only a few documented cases of this complication occurring at a delayed interval. This case clearly demonstrates this rare complication of esophageal stent placement in the setting of esophageal adenocarcinoma.

Introduction

Self-expanding metallic stents (SEMS) are typically utilized in those with dysphagia or obstruction secondary to a malignant process, most commonly esophageal adenocarcinoma (EAC). SEMS were first used in 1990 for relieving symptoms of malignant esophageal obstruction and since that time have become a cornerstone in the palliation of symptoms of esophageal malignancy [1–3]. SEMS placement has been shown to provide immediate improvement of dysphagia in 80%-85% of patients, which is more effective than plastic stents which show improvement in 62%-69% of patients [1,4]. Furthermore, SEMS have a reduced risk of causing stent-related mortality (14%) as compared to plastic stents (29%) [1,4,5].

Metallic esophageal stents may be covered, partially covered, or uncovered [6]. Generally, covered and partially covered stents are more prone to migration but less prone to tumor ingrowth and are more easily removed [6,7]. Comparatively, un-

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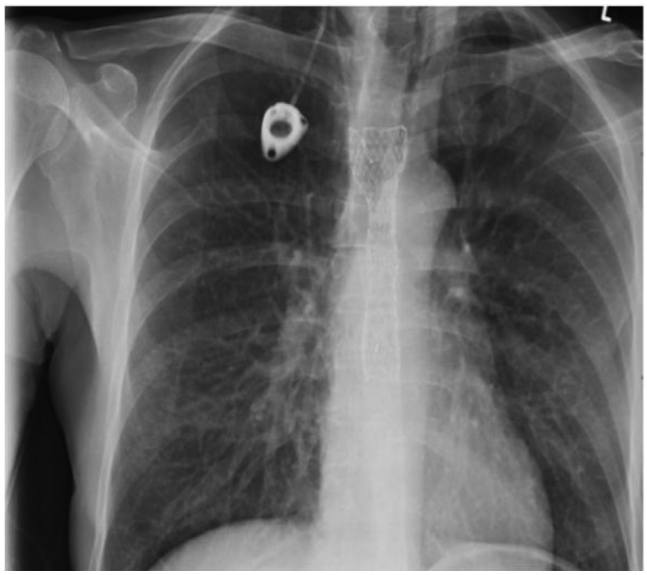

Fig. 1 – AP chest radiograph completed shortly after placement of 2 esophageal SEMS which demonstrated appropriate positioning.

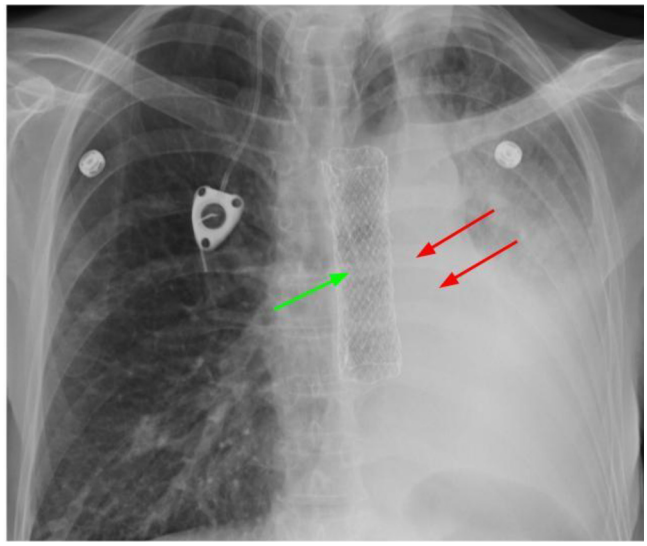

Fig. 2 – PA chest radiograph shows the esophageal stent (green arrow) and interval loss of visualization of the normally air filled left mainstem bronchus (red arrows). There is associated new left side pulmonary volume loss and new left sided consolidative pulmonary opacities.

covered stents are less prone to migration but are more likely to have tumor ingrowth and often cannot be removed [6].

A variety of complications may occur secondary to covered SEMS placement, including those which are life-threatening [8]. The most common complications associated with esophageal stents can be grouped into immediate, early, and delayed manifestations. Immediate complications occur during implantation of the device and include perforation, stent malposition, and respiratory tract compression. Early complications are characterized as occurring within 1 week of implantation of an esophageal stent and include bleeding, chest pain, fever, gastroesophageal reflux, globus sensation, perforation, and stent migration [6,8]. Delayed complications occur later than 1 week following stent placement and include stent migration, stent occlusion, tumor ingrowth, development of esophageal fistulae, and recurrence of strictures [6,8]. The most common complication of covered SEMS is stent migration, with a frequency of 36.3% [9]. Other common complications include pain, obstruction, and bleeding. Notably, overall stent related mortality in the first 24 hours following insertion is 1.7% [10].

Case report

At a small, rural hospital, a 58-year-old male presented with a worsening cough and shortness of breath for 2 days. Past medical history was significant for esophageal adenocarcinoma status post chemotherapy, radiation, and 2 SEMS placements approximately 4 months prior (Fig. 1). Associated symptoms included generalized weakness, anorexia, diarrhea, and chest pain with coughing. On examination, the patient's breath sounds were decreased bilaterally. Laboratory studies were significant for 15.9 white blood cells and a D-dimer of 737.

A chest x-ray showed significant left lower lobe consolidative opacities and developing consolidative opacities in the right upper and right lower lobes (Fig. 2). Due to concern for a pulmonary embolism, a CTA chest was ordered that showed a patent esophageal stent with mass effect causing significant extrinsic narrowing of the proximal left mainstem bronchus with significant consolidative opacities in the left lung (Figs. 3 and 4). The patient was then transferred to a larger regional hospital.

Following arrival, the 2 esophageal stents were removed by a gastroenterologist who noted significant esophageal erosions. Following the procedure, the patient continued to be ill-appearing and required increased oxygen supplementation. The patient was placed on NPO orders for 2 days and then transitioned to clear liquids. He immediately aspirated fluid with this trial and was transitioned back to NPO status. A follow-up CT chest with IV contrast showed moderate improvement of the extrinsic narrowing of the left mainstem bronchus and improved left lung consolidation. However, the follow up CT also demonstrated a tracheoesophageal fistula and a left main bronchoesophageal fistula (Figs. 5 and 6).

These findings were discussed with the patent. Given the limited further oncologic treatment available, he decided to pursue palliative care only.

Discussion

Respiratory tract compression leading to airway compromise is a potentially fatal outcome of SEMS placement. Immediate airway compromise during or shortly after esophageal stenting occurs in 0%-2% [4,8] of cases. However, our case demonstrated a delayed presentation of airway compromise

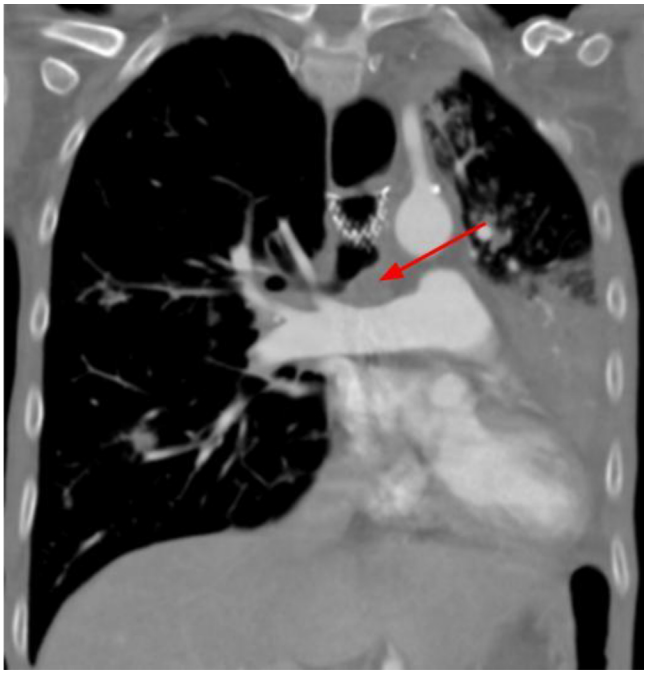

Fig. 3 – CTA chest coronal view shows obstruction of the proximal left main bronchus and postobstructive consolidative opacities in the ligula. The extrinsic compression from the esophageal stent causing the obstruction is not well seen in this view.

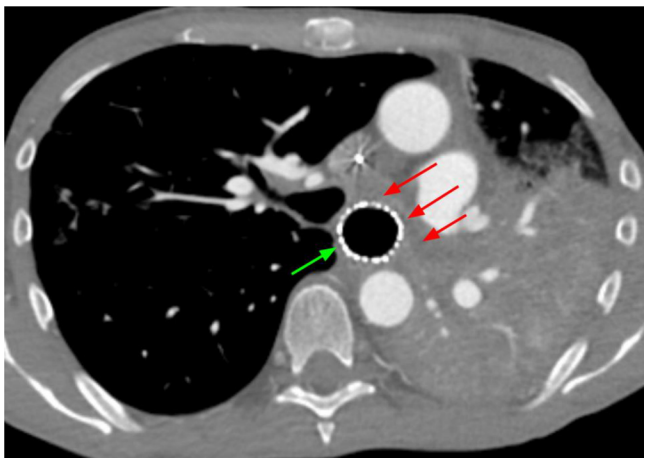

Fig. 4 – CTA chest axial view demonstrates that the esophageal stent (green arrow) extrinsically compresses and occludes the left mainstem bronchus (red arrows). There are significant postobstructive consolidative opacities in the left lung.

4 months after the placement of an esophageal stent. There is no known data available on either incidence or mortality of this delayed complication.

Delayed-onset bronchial obstruction is an exceptionally rare complication following SEMS placement with only a few cases reported in the literature [5,11]. It is a poorly studied phenomenon with risk factors being unknown; however, it is possible there is an overlap of the predisposing factors that are associated with immediate onset airway compromise. Several of these important factors include stent position, history of irradiation, and associated mediastinal mass [12,13].

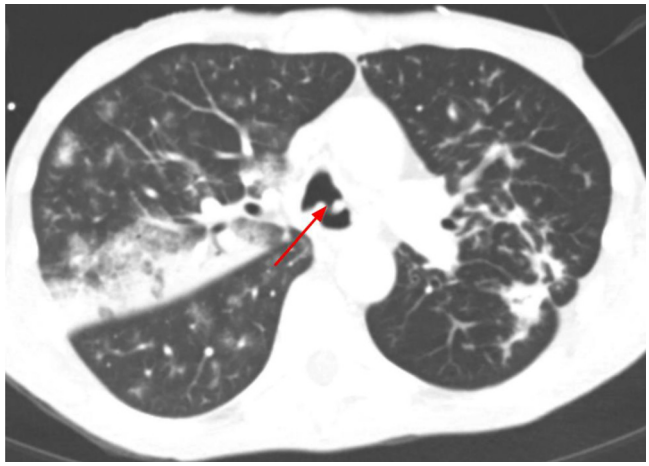

Fig. 5 – Patient is status post esophageal stent removal. Axial CT demonstrates a tracheoesophageal fistula (red arrow).

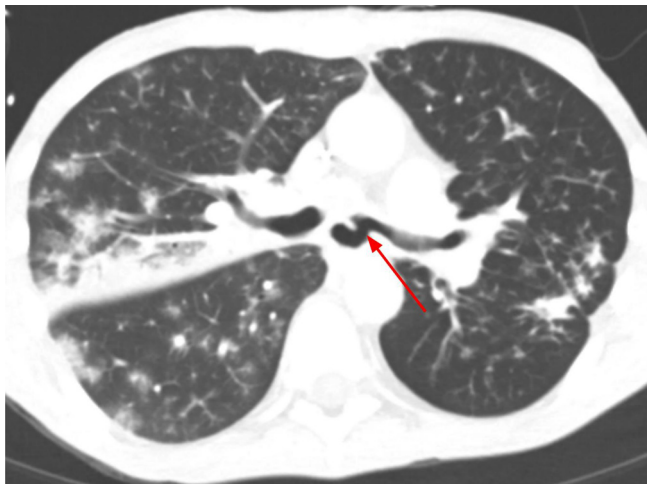

Fig. 6 – Axial CT also demonstrates a bronchoesophageal fistula (red arrow).

The most important factor in immediate onset airway compromise is proximal positioning of the stent in the esophagus at or above the level of the carina. Furthermore, there is evidence to suggest that a history of radiation is associated with an increased number of severe complications of stent placement [12,14]. Lastly, increasing size of a mediastinal mass appears to be associated with an increased risk for airway compromise secondary to stent placement [13]. We were not able to locate any statistics on the relative risks associated with these risk factors.

A potential management option in a patient with delayed airway obstruction secondary to SEMS placement includes tracheobronchial stenting, although this may both be tech-

nically difficult depending on the degree of airway obstruction [5,13]. Alternatively, removal of the esophageal stent(s) is an option, though this may limit long-term prognosis without further intervention [13]. Due to the infrequency of this delayed complication, we were unable to find statistics on the efficacy of either management option.

Conclusions

Esophageal stenting is an important source of palliation in those with esophageal malignancy. Self-expanding metal stents are associated with a variety of complications including bronchial airway obstruction. We present a rare case of delayed bronchial airway obstruction occurring 4 months after esophageal stent placement.

Patient consent

Written informed consent for the publication of this case report was obtained from the patient.

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