

Iatrogenic Esophageal Perforation Associated With Extensive Esophageal Dissection

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Abstract

The causes of esophageal perforation are encompassed in a wide spectrum, but importantly, the treatment is multifaceted based upon the cause, underlying pathology, and the patients' clinical status. The most common cause is iatrogenic, from surgical instrumentation. We present a fifty one year old female who presented hours after undergoing an esophagogastroduodenoscopy with serial esophageal dilation with complaints of chest and abdominal pain. CT scan and upper gastrointestinal series revealed a perforation in the cervical esophagus, dissection down the length of the esophagus, and another perforation distally. She remained stable throughout her hospitalization, so she was managed conservatively.

Introduction

The most common cause for esophageal perforation is iatrogenic due to endoscopic instrumentation for diagnostic and/or therapeutic intervention [1]. This complication can be managed conservatively or surgically depending on the timing of presentation, extent of the injury, and the etiology [1,2]. The most common location for a perforation is at Killian's triangle in the cervical esophagus due to the inherent weakness of the esophageal musculature [3]. This triangle is bordered superiorly by fibers of the inferior constrictor muscle and inferiorly by the cricopharyngeus muscle. Esophageal dissection is a rare clinical entity, whose etiology is most commonly idiopathic, traumatic, or secondary to sudden increases in esophageal pressure [4]. Here, we present a case and discuss the management of a patient with an iatrogenic esophageal perforation at the cervical esophagus, creation of a false lumen down the length of the esophagus, and another perforation at the distal esophagus.

History

A fifty one year old female with a history of squamous cell carcinoma of the left base of the tongue, treated with a left hemiglossectomy, left neck dissection and postoperative radiation therapy presented with anterior chest pain and constant, worsening epigastric and right-sided abdominal pain. Prior to presentation, she had undergone an outpatient Esophagogastroduodenoscopy (EGD) and serial esophageal dilation with 30F to 60F diameter dilators for dysphagia with soft and solid foods. She denied odynophagia, nausea, vomiting, fever, chest pain, and dyspnea. At the time of presentation, she was hemodynamically stable and was afebrile. Her physical examination revealed a soft, non-distended abdomen that was very tender to palpation in the epigastrium, right upper quadrant, and right lower quadrant. There was no peritoneal signs or crepitus appreciated. CBC was significant for leukocytosis (17.3K/uL) with increased neutrophils (91%). CT scan of the chest/abdomen/pelvis without contrast was performed and showed possibly two lumens down the length of the esophagus, pneumomediastinum near the distal esophagus, and pneumoperitoneum anterior to the liver and in the left upper quadrant (Figure 1). Subsequently, an Upper Gastrointestinal Series (UGI) was performed with gastrografin that did not reveal extravasation; however, it did appear that she had an esophageal dissection with a submucosal line of contrast (Figure 2).

At this point, she was admitted to the cardiothoracic intensive care unit, and given her stable status with no free extravasation of contrast on UGI, she was treated conservatively. She was made strictly NPO and intravenous cefepime and metronidazole were started for mediastinitis prophylaxis. Throughout her hospital course, she continued to remain stable; however there was concern over her long term nutrition. Given the fact that she previously had a gastrostomy for 6 months following her hemiglossectomy, she elected to have a Percutaneous Endoscopic Gastrostomy (PEG) placed over having a PICC line with total parenteral nutrition. She subsequently underwent an EGD and PEG insertion on hospital day five. The EGD revealed an abnormal appearing area in proximal esophagus at approximately 15cm and a submucosal abnormality extending the entire length of the

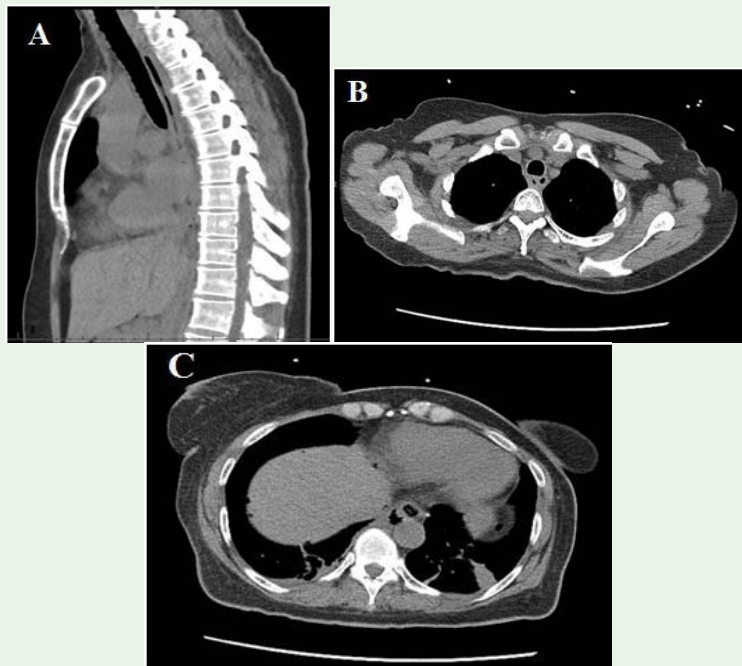


Figure 1: Axial view of a computed tomography scan showing the cervical esophagus and two esophageal lumens. A) Coronal view of the thorax. B) Axial view showing the cervical esophagus. C) Axial view showing the distal esophagus at the gastroesophageal junction.

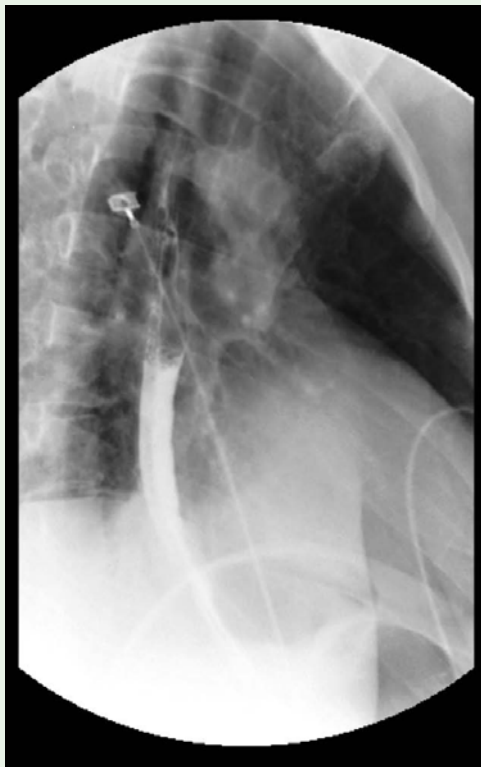


Figure 2: Upper-gastrointestinal series showing what appears to be two esophageal lumens in the cervical to mid-thoracic esophagus.



Figure 3: Esophagogastroduodenoscopy showing abnormality along the posterior wall, concerning for an Esophageal dissection. This was approximately 15cm from the incisors.

esophagus with no obvious distal esophageal perforation (Figure 3). Following this procedure, she was started on oral levofloxacin and metronidazole, tube feeding was started, and she was subsequently discharged on hospital day seven.

Discussion

Esophageal perforation, although rare, can be associated with high morbidity and mortality, particularly if the injury is not detected early or before the signs of sepsis have set in [3,5]. Anatomically, the esophagus lacks a serosal layer, making it more susceptible to perforation than other gastrointestinal organs. Once perforation occurs, gastric contents and bile enter the mediastinum potentially leading to necrotizing mediastinitis. The primary and immediate management of an esophageal perforation include first and foremost a prompt diagnosis, followed by stabilization of the patient, and assessment for operative or non-operative management. The tenets of both non-operative and operative management include source control, drainage, and nutrition. The near doubling of overall mortality with a delay in diagnosis greater than 24 hours after perforation emphasizes the importance of a timely diagnosis and treatment [1,5]. The optimal treatment option depends on the timing of presentation, extent of the injury, and the etiology. Our case presents a unique situation in that the patient had a both proximal and distal perforation, with an apparent dissection between. Iatrogenic esophageal perforation with dissection has been described [4], but not with proximal and distal perforation with dissection extending the length of the esophagus. This patient did not demonstrate any systemic signs of sepsis or deterioration and we had source control, for these reasons non-operative management was initiated. However, if the patient began to deteriorate, the definitive treatment algorithm and management strategy provided its own unique difficulties. To address the proximal perforation cervical esophageal stenting was not considered given the high failure rates at this location. Primary surgical repair of the perforations was considered, however, how to

fix the submucosal tract was not clear. This patient also had a history of radiation to this area, which would inherently cause the tissue to be more friable and with less structural integrity for a durable repair. Finally, stenting of the thoracic esophagus with cervical drain placement was discussed as another potential option. Fortunately for the patient, she remained stable and was discharged after a week in the hospital. Esophageal perforation is a surgical emergency that requires prompt diagnosis, stabilization of the patient, and assessment for definitive management. Esophageal perforation associated with extensive dissection is something that has not been described in the literature. Our patient had contained perforations and remained stable, however, if she deteriorated, how to best manage these injuries present multiple challenges.

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