Nonsurgical Management of Boerhaave’s Syndrome with a Fully Covered Self-Expanding Stent

CASE REPORT

A 38 year old man was referred from an outside institution for evaluation and management of esophageal perforation. The patient initially presented with retching, bright red vomitus, and chest pain in the setting of a presumed food impaction after eating pork. The patient described a history of intermittent dysphagia to solids without antecedent weight loss over the past several years. On exam the patient was febrile and tachycardic with tenderness in the epigastrium and the upper abdomen. He was unable to swallow his own saliva due to symptoms of esophageal obstruction. CT scan performed with contrast showed an apparent perforation of the distal esophagus with free air in the surrounding mediastinum consistent with Boerhaave syndrome. At this point he was transferred to our institution for evaluation and management. (Figure 1)

Upper GI endoscopy was performed using CO2 for insufflation and revealed a large food bolus (meat) impacted in the lower third of the esophagus. This was removed without difficulty. Immediately adjacent to the site of the food impaction, a 2cm long linear perforation with surrounding inflamed tissue was found in the lower third of the esophagus, just above the GEJ and along the left lateral wall of the esophagus. (Figure 2) There was visible bubbling of gas/air through the perforation.

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Localized edematous mucosa found in the gastric fundus showed a positive “pillow sign” when probed with closed forceps consistent with submucosal gastric wall pneumatosis. The site of perforation appeared quite long and inflamed. Given the overall appearance, endoscopic clipping was not felt to be ideal.

At this point, and in accord with our preprocedure discussions with the patient, we elected to place a metal stent to attempt to seal the perforation. An 18mm X 103 mm fully covered WallFlex Esophageal stent (Boston Scientific, Natick MA) was placed across the site of perforation without difficulty and on the first attempt. Contrast injection showed no extravasation of contrast into the mediastinum and free flow into the stomach. (Figure 3)

The patient was admitted to the Intermediate care unit for observation thereafter. A repeat CT of the chest with contrast was repeated and showed continued air in the posterior mediastinum but no free fluid. The patient was kept on the surgical floor post-procedure, kept NPO with nasojejunal (NJ) tube, and treated with a 7 day course of fluconazole and zosyn. The patient was advanced to a clear liquid diet and discharged on hospital day 10 following an esophagram that was without evidence of extravasation, albeit with a stent in place.

Four weeks later, repeat upper GI endoscopy was performed and the stent was removed without difficulty. Examination of the esophagus did not reveal any evidence of mucosal tear, injury, or perforation consistent with healing of previous esophageal perforation. Contrast was repeatedly injected under fluoroscopic guidance and no extravasation was evident. (Figure 4) Contrast passed freely into the stomach. The patient has done well thereafter.
DISCUSSION

Boerhaave’s syndrome is most commonly conceived of as a spontaneous perforation of the esophagus. The condition often results from a rise in intraluminal pressure in the distal esophagus with simultaneous decreased intrathoracic pressure, most commonly induced by straining and vomiting, often in the context of alcohol use and/or acute alcohol intoxication. Foreign bodies, usually fish or poultry bones, can cause esophageal perforation as well but this is not typically considered to be Boerhaave’s syndrome.

The typical presentation of esophageal rupture includes severe retching or vomiting followed by severe chest or epigastric pain. The typical patient with Boerhaave’s syndrome develops vomiting that may be bloody that is followed by lower chest pain as well as mediastinal or subcutaneous emphysema (known as Mackler’s triad). Other signs of esophageal perforation include tachycardia, hypotension, shock, fever, subcutaneous emphysema, pneumothorax and hemothorax.

Historically, Boerhaave’s syndrome mandated surgery. Recently there has been a growing body of evidence to support successful non-operative management in selected patients. Common indications for consideration of operative management include early postemetic perforation, hemodynamic instability, intra-abdominal perforation, the presence of underlying malignancy, or a stricture in the region of the perforation. Various surgical procedures have been described for esophageal perforation in this setting including primary repair with and without reinforcement with either tissue or mesh, simple drainage of the thoracic cavity, and single stage esophageal resection with or without primary reconstruction.

Non-operative treatment is becoming increasingly common and can be considered if the perforation is felt to be small enough for endoscopic therapy and the patient is felt to be stable enough to undergo endoscopy. Some patients may still require mediastinal drainage even if endoscopic treatment is undertaken, but in general these are much smaller procedures than primary esophageal repairs.

Endoscopic placement of fully covered removable stents is suitable for benign esophageal injury, as the stent serves to both seal the perforation and divert swallowed solids and liquids to the stomach and not out to the mediastinum and/or abdomen as shown in Figure 3 and Figure 4.

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the esophagus heals. These stents, which are now available from multiple vendors in the United States, allow for rapid leak site occlusion, are removable, and avoid the potential morbidity of operative repair. For perforations associated with instrumentation, foreign body ingestion, and Boerhaave’s syndrome, endoscopic closure of esophageal perforation with metallic clips has also been reported. This mode of treatment has been used in several patients with small perforations and minimal symptoms of infection. Furthermore, endoscopic clipping has been successfully used for primary repair of Boerhaave syndrome in patients with stable general condition, limited esophageal disruption, and early diagnosis (within 12 hours after the onset of symptoms). A new over-the-scope clip is another potential option for treating these patients. If patients managed non-operatively begin to show signs of sepsis or clinical decompensation, surgical evaluation is warranted.

This case is noteworthy in that our patient was treated with successful non-surgical management in the setting of a combined Boerhaave syndrome with esophageal perforation and a simultaneous food impaction within the first 12 hours of patient presentation. Interestingly, it is possible that the impacted food bolus may have helped to prevent excessive contamination of the mediastinum as it may have served a kind of mechanical barrier at the site of the perforation. Our patient met criteria for non-surgical management in that he was clinically stable and able to undergo endoscopy and, once his food bolus was removed, was found to have a tear felt to be amenable to stent therapy. In this case the stent allowed for leak site occlusion and eventual healing, allowing the patient to avoid the potential morbidity of operative repair, and illustrates that non-operative management of Boerhaave’s syndrome can now be performed in selected patients.

References