Case Report

Colopericardial Fistula following Colonic Interposition: Can Primary Repair be Safely Performed?

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Abstract

Colopericardial fistula is a rare long-term complication of colonic interposition. Without prompt surgical treatment, this disease entity is ultimately fatal. We present a case of a 24-year-old male who underwent colonic interposition for long gap esophageal atresia two decades prior to presentation, successfully treated with division of the fistula tract, primary repair of the colonic defect and a pericardial window.

Introduction

Esophageal atresia is a rare congenital anomaly of the esophagus that is commonly associated with tracheoesophageal fistula. The cornerstone surgical treatment has always been to attempt to reconstruct the native esophagus, and to reestablish primary continuity [1]. Nevertheless, in a minority of cases, reestablishing the patient’s native esophagus is impractical. Therefore, in these cases, it would be prudent to abandon the native esophagus and to proceed with a replacement procedure [2].

Colonic interposition was not popularized for the pediatric population until the mid-1900s by the work of Sandblom [3]. Complications that have been extensively described include but are not limited to, anastomotic leaks, strictures, colonic redundancy, and reflux colitis [4]. In this report, we describe a very rare, potentially fatal, complication of colonic interposition, decades after the index operation, and the successful treatment modality utilized.

Case Presentation

This is a case of a 24-year-old male, who underwent right colonic interposition for pure long gap esophageal atresia (Type A) at the age of 1, and had no complaints until one week prior to presentation, when he started to experience stabbing chest pain, high grade fever, and progressive productive cough. At the time of arrival, he was found to be borderline hypotensive, tachycardic and tachypneic. He had significant wheezing on auscultation and a chest x-ray confirmed the presence of left lower lobe pneumonia. The patient was admitted with a diagnosis of community-acquired pneumonia, and was started on intravenous antibiotics. However, his condition deteriorated; he required noninvasive positive pressure ventilatory support to maintain adequate oxygenation. A computed tomography scan of the chest with IV contrast revealed the evidence of pneumopericardium, and a colopericardial fistula was identified. (Figure 1)
Figure 1: Computed tomography scan of the chest with IV contrast revealing a fistula between the inferior aspect of the pericardium (immediately supra-diaphragmatic) and the superior-anterior conduit at level of the distal anastomosis. It measured 17mm in length and 19mm in diameter (white arrow). Note the significant pericardial effusion and pneumopericardium (arrowhead) in both Coronal (A) and Axial (B) views.

At this point, the patient was started on parenteral nutrition, switched to broader spectrum coverage, and allowed nothing orally. Cardiac evaluation with a transthoracic echocardiography revealed pericardial effusion and constrictive pericarditis. His condition stabilized over the next 24 allowing further diagnostic evaluation before attempting surgical treatment.

Endoscopic evaluation revealed the fistula tract leading to the pericardium at the cologastric junction. Examination of the stomach and duodenum revealed no pathology (Figure 2).

Figure 2: Endoscopic view of the fistula tract at 38cm from the incisors though which the pericardium can be seen (Arrow) 1cm defect at the cologastric junction. Notice the hemorrhagic inflamed colonic mucosa adjacent to the defect.

With the cardiothoracic surgeon on board, the patient was taken to the operating room, and the decision was made to proceed with explorative laparotomy through the previous midline scar given the caudal location of the fistula. The patient was prepped, nevertheless, for a possible sternotomy. Upon entering the abdomen, extensive adhesiolysis was undertaken. The right colonic graft was identified through the hiatus to the posterior mediastinum anastomosed to the stomach. A transhiatal dissection was then undertaken cephalad, until the fistula was clearly identified entering the pericardium at its most caudal aspect. It was divided and sent to pathology. At this time, copious irrigation of the pericardium with warm saline was performed, retrieving dense and numerous undigested food particles. This process was repeated several times until the aspirate was completely clear. The colonic defect was debrided to healthy edges and using interrupted 3-0 Vicryl suture (Ethicon), a primary repair was performed ensuring a patent lumen. The pericardial defect was enlarged, and a pericardial window was constructed for drainage. A vascularized segment of omentum was interposed in-between the colonic graft and the pericardium. Then, we instructed the anesthesiologist to perform a methylene blue test through the nasogastric tube, which confirmed an intact repair. At the end of the procedure, a feeding jejunostomy tube was constructed to establish postoperative enteral nutrition.

Postoperatively, the patient was transferred to the intensive care unit, maintained on board spectrum antibiotics pending intraoperative cultures. His course was complicated with a large left sided pleural effusion that required drainage percutaneously. His condition improved over the next couple of days. He was transferred to the hospital ward being already started on enteral tube feeds. Parenteral nutrition was gradually tapered off. A watersoluble oral contrast study was performed on postoperative day 12 that revealed an intact repair. The patient was started then on oral clear liquid feeds, and was discharged home two days later on an oral feeding plan supplemented with jejunostomy tube feed, and a course of antibiotics tailored as per the sensitivity of his cultures.

Discussion

The colon was once a popular conduit for esophageal replacement. The right, transverse or left colon with its vascular pedicle, in an isoperistaltic or antiperistaltic fashion, could be utilized. However, the choice of conduit remains to be based on the surgeon preference and expertise, as previous studies comparing the outcomes between patients undergoing gastric pullup or colonic interposition, for benign or malignant etiologies, failed to show any consistent benefit of one technique over the other [4,5].

Colopericardial fistula and its deleterious sequel of septic pericarditis is a life-threatening complication of colonic interposition that has been described previously in a few reports. The etiology for this complication has been attributed to acid or bile reflux, and rarely complications of diverticulitis or malignancy in the interposition graft [6-8]. Our patient had no symptoms of peptic ulcer disease or bile reflux, and endoscopic evaluation and biopsies revealed no evidence of any pathology in the residual stomach and...
duodenum. However, significant erythema and inflammation were noted at the cologastric junction (Figure 2).

The colon is an organ, although previously thought otherwise, susceptible to acid reflux, with peptic ulcerations developing at the cologastric junction in around 30% of these patients [8]. Regardless of the etiology, without prompt and aggressive medical and surgical therapy to control the septic focus (septic pericarditis) and nutritional support, it is unlikely patients would survive this fatal complication. We describe a case of primary repair of the colonic defect, division of the fistula tract through a midline laparatomy, and adequate drainage of the pericardium through a pericardial window with a vascularized interposition Omental graft, obviating the need for a thoracotomy. The patient did excellent postoperatively, and at 3 months of follow up even gained 5 kilograms of weight from oral nutrition. We believe, as previous reports have shown [6] that if sufficient healthy tissue remains after division of the fistula, attempting primary repair in the aim of avoiding extensive and unnecessary surgical procedures and preserving the original conduit is prudent.

**Conflict of Interest**

There are no acknowledgements and we have nothing to disclose.

**References**