Secondary Aortoenteric Fistula: Review of a Case and Literature

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Abstract

The objective of this study was to assess early diagnosis and management of hematemesis in patients who have a history of aortic reconstructive surgery. A 70-year-old male presented with complaints of active hematemesis and melena for 2 days at the emergency room. He gave a history of aortobifemoral bypass for bilateral iliac arterial occlusive disease 9 years ago. Urgent computed tomography (CT) angiography was suggestive of large aortic anastomotic pseudoaneurysm with aortoenteric fistula (AEF). Urgent endovascular repair of pseudoaneurysm with right femoral artery to left femoral artery crossover with ligation of left femoral artery, left common iliac artery, and left graft limb was done. The patient did well after the surgical management. Routine follow-up was done. Repeat CT angiography was done. No any major complication was encountered. Secondary AEF is a life-threatening complication of abdominal aortic reconstruction. The clinical manifestation of the AEF is always hematemesis. Treatment of the disease is urgent hybrid surgical intervention.

Keywords: Aortoenteric fistula, computed tomography angiography, endovascular, hematemesis

Introduction

Aortoenteric fistula (AEF) is an uncommon but severe life-threatening complication of aortic reconstructive surgery.[1] Fistulas occurring after aortic reconstructive surgery, also called aortic graft-enteric fistulas, are considered secondary AEF. The most common cause of abdominal AEF was aortic aneurysm, followed by infectious aortitis due to syphilis or tuberculosis before 1960.[2] However, over the past three decades or so, erosion of the intestine by prosthetic vascular grafts has become a much more common cause, with an incidence of up to 4%.[3] Bastounis et al. reported that the mean interval from the initial operation to the onset of upper gastrointestinal bleeding was 32 months.[4] The 20-year experience with secondary AEF at the Johns Hopkins Medical Institution showed the average to be 2.8 years.[5] The first reported secondary AEF was reported by Brock in a case involving an aortic homograft and the duodenum.[6] In 1956, Birch et al.[7] presented the first AEF caused by a prosthetic graft of the aorta. In 1958, Mackenzie et al.[8] demonstrated the first successful repair of a secondary AEF between a synthetic graft and the intestine. Due to the anatomic proximity, the majority of cases involve the duodenum, with the proximal suture line of an aortic prosthesis. Prompt diagnosis with surgical intervention is the only possible treatment that preserves the patient’s life. Extra-anatomic bypass with graft excision and aortic stump ligation or in situ replacement of infected graft can be a better option for stable patients. Endovascular repair can be better in unstable patients who are at high risk for conventional open surgical treatment.

Case Report

A 70-year-old male presented at emergency room with complaints of active hematemesis and melena for 2 days. He gave a history of aortobifemoral polytetrafluoroethylene graft bypass surgery 9 years ago for bilateral iliac arterial occlusive disease. There was no history of peptic ulcer disease or any other gastrointestinal pathology. On physical examination, the patient appeared pale with a cold, clammy skin in a preshock with a pulse rate 112/min regular, a respiratory rate...
22/min, and a blood pressure 90/60 mmHg. Pedal pulses were feeble. Chest wall, heart, and lungs were normal on physical examination. There was a midline laparotomy scar. There was epigastric tenderness with no other findings. Computed tomography (CT) angiography was suggestive of large aortic anastomotic pseudoaneurysm with AEF [Figure 1]. Ultrasound studies depicted blood clots in the distal half of duodenum. Echocardiography revealed ejection fraction of 60%. The patient was explained of all options from conservative surgery to endovascular options. They preferred endovascular options. The patient was admitted through emergency room and immediately shifted to operating room for urgent intervention. Bilateral groin incisions were made and grafts were exposed, isolated, and clamped. Aorto uni-iliac self-expanding Fluency-covered stent graft 24 mm × 12 mm was deployed after placing coils in pseudoaneurysm. Left limb of the graft ligated through left flank oblique incision (retroperitoneal approach). Check angiography was done which revealed complete exclusion of pseudoaneurysm [Figure 2]. Postoperatively, the patient was maintained on elective ventilation for 1 day. He was given total parenteral nutrition for 3 days. Pedal pulses were well palpable. He was planned for follow-up by CT scans after 1 month and 6 months [Figure 3], then every 6 months till 2 years, after which the follow-up would be on yearly basis. If persistent infection is suspected either clinically or in follow-up imaging, an elective conventional surgery could be planned.

RESULTS
The repeated clinical and laboratory examination did not reveal any sign of infection. Primary digestive tract radiography did not show any sign of duodenal stenosis. Ultrasonography Doppler and CT angiography were carried out after 1 month and after 6 months [Figure 3]. No major complication was encountered. Totally sealed pseudoaneurysm and patent aorto uni-iliac stent and femoral-femoral crossover graft were seen.

DISCUSSION
It has been difficult for vascular surgeon to diagnose and treat AEF.[9] The diagnosis of AEF should not be overlooked in a patient with hematemesis and melena who underwent an aortobifemoral bypass without esophagogastrroduodenal pathologies.[10] In the present clinical case, ultrasound studies depicted blood clots in the distal half of duodenum. These signs associated with high gastroesophageal bleeding and the history of aortobifemoral bypass grafting 9 years previously lead to the diagnosis of AEF.

The longest postoperative interval for an AEF was 23 years after aortofemoral bypass surgery.[11] In this case, the complication presented 9 years after aortobifemoral bypass surgery. The treatment of choice is aortic stenting and femoral-femoral crossover bypass. The mortality rate during surgery and in the postoperative period is relatively high, averaging approximately 50%–60%.[12] Chang et al.[12] from Taiwan reported a similar case. A secondary AEF developed in an 80-year-old patient as an immediate postoperative complication after aortic reconstruction surgery;
the patient died on the 20th day after primary surgery. This patient did not survive probably due to massive blood loss, very old age, and infection. Our patient is also older and presented after 9 years with melena and hematemesis, which was diagnosed and managed promptly, enabling patient survival.

Endovascular repair appears to be a promising therapeutic modality, especially under conditions such as emergency and palliative treatment of patients at high risk for conventional surgical treatment or who are not willing for conventional surgical treatment. It has excellent short-term results compared with inflammation, scarring, bleeding, or hemodynamic instability with conventional surgery.

**Conclusion**

Secondary AEF is a severe life-threatening complication of abdominal aortic reconstruction. The complication often occurs years after aortic surgery. The clinical manifestation of the AEF is always hematemesis. Treatment of the disease is urgent hybrid surgical (open and endovascular) intervention. If operative treatment is not performed promptly, the mortality is very high.

**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 conflicts of interest.

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