Primary Aorto-colic Fistula Arising from a Post-traumatic Aortic Pseudoaneurysm

I. Mavioglu,* N. Sucu, B. N. Aytacoglu, A. Gul and M. Dikmengil

Cardiovascular Surgery Department, School of Medicine, Mersin University, Mersin, Turkey

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Introduction

A primary aorto-enteric fistula (PAEF) is a rare, life-threatening cause of gastrointestinal (GI) bleeding. It usually results from direct erosion of an atherosclerotic abdominal aortic aneurysm but infection (tuberculosis, syphilis, salmonella, staphylococcal) is another common cause.1,3 Rarely, a PAEF is a result of cervical cancer, colon cancer, diverticulitis, appendicitis, duodenal ulcer, radiation therapy or trauma.2 Although it is a rare phenomenon, it may be fatal due to catastrophic gastrointestinal haemorrhage. It demands an aggressive pre-operative evaluation and a high index of suspicion for a successful outcome. Abdominal computed tomography (CT) can greatly assist in establishing the diagnosis in hemodynamically stable patients. Taking PAEF into consideration as a cause of gastrointestinal bleeding will save much precious time in the treatment of this life threatening process.

Case Presentation

A 17-year-old Caucasian male patient presented to the emergency room with massive bright red lower gastrointestinal bleeding and abdominal pain. On admission his blood pressure was 80/50 mmHg, pulse was 120 b/min and he was very pale. His medical history revealed a traffic accident followed by an explorative laparotomy for possible intra-abdominal hemorrhage 10 years previously in another hospital but his previous hospital records were unobtainable. It was learnt from his parents that he had recovered without complication 5 days after the previous surgery. Physical examination was normal except for bright red blood found on rectal examination. The initial hematocrit was 23%, platelet count, and prothrombin and partial thromboplastin time were within normal limits. His hemodynamic status improved after infusion of three units of packed red blood cells. Colonoscopy did not reveal a source for the bleeding. Endoscopic gastroduodenoscopy was performed and was found to be normal. Abdominal ultrasonography performed on the following day suggested an abdominal aortic pseudoaneurysm just proximal to the common iliac arteries so a CT of the abdomen was done. It revealed a 3.5×2 cm abdominal aortic pseudoaneurysm with calcification, originating from the left aorto iliac junction and contrast seeping into the thickened walls of the descending colon suggested the presence of an aorto-colic fistula (Fig. 1).

The patient was operated upon with the diagnosis of aorto-colic fistula. The pseudoaneurysm was stuck to the descending colon just proximal to the sigmoid portion (Fig. 2). There was intense inflammation in this region. The distal aorta and the common iliac arteries were eroded. After controlling the proximal and distal segments of the arteries, the operation field was covered by gauze soaked with vancomycin. The colon was dissected freely, the wall defect was closed primarily and displaced from the inflamed area. The aneurysmal aortic sac and the eroded iliac arteries...
were excised and extensive debridement of the surrounding inflammatory tissue and thrombi was performed.

In spite of the high risk of infection, the aorta was reconstructed in its original location with a collagen coated Intergard Silver knitted bifurcated graft (Intervascular,Datascope Company,France) taking into consideration that this material would be more resistant to infection. The proximal anastomosis was carried out end-to-end 2 cm below the renal arteries and the distal anastomosis was carried out end-to-end to the common iliac arteries after all inflammatory tissue was removed. The graft was also covered with a pedicle of omentum to separate it from the neighboring bowel segments. The rest of the operation was standard with closure of the abdominal wall with a vacuum drain around the aorta which was removed on the day after operation.

Intraoperative cultures were negative so antibiotic therapy (vancomycin, ornidazole and amicacin sulphate) was stopped on the 10th post-operative day. There were no post-operative complications and the patient was discharged at the end of 4th week. The patient was still under regular follow-up and was doing well 6 months after the operation. Abdominal ultrasonography revealed a normally functioning graft with no fluid collection.

**Discussion**

A PAEF is still a rare disease with lethal complications and fewer than 250 cases reported in the literature worldwide until 1996. The diagnosis of an aortoenteric fistula depends on a high index of suspicion, because the signs and symptoms of the disease are obscure and non-specific. The classical triad of abdominal pain, gastrointestinal bleeding and pulsatile mass are present in only the minority of patients thereby giving rise to difficulties in diagnosis. Only in 40% of 118 cases of PAEF reviewed by Reckless et al. were the presenting symptoms of haematemesis or
melaena. Similarly, Sweeney reviewed 118 patients with primary aortoduodenal fistula and found that 25% had a palpable abdominal mass, 32% had some form of pain, and 64% had haematemesis or melaena as the initial symptom. The third part of the duodenum, which retroperitoneally is in close contact with the abdominal aorta, was the most frequent site of aorto-enteric fistula (more than 80%) followed by jejunum, ileum, colon, oesophagus and stomach.

In our case, the aorta was in communication with the colon and shock and abdominal pain were the presenting symptoms. Massive and bright red bleeding should alert the physician to the possibility of an aorto-enteric fistula and lead to the appropriate diagnostic investigations.

The period between initial bleeding and surgery or death has been reported to be between 6 h and several weeks in various studies with 50% of cases lasting 24 h. Prompt surgery is imperative once the diagnosis is made. However, we took our patient to surgery 48 h after admission because of delay in carrying out the diagnostic studies.

The diagnostic value of conventional radiological methods and endoscopy is poor in aorto-enteric fistula but they can help to exclude the most common causes of gastrointestinal bleeding if there is time. In our case, the endoscopic interventions mentioned above were negative and caused a delay in the diagnosis. We reached the diagnosis using abdominal ultrasonography which showed the abdominal aortic aneurysm and with CT demonstrated the seeping of contrast into colon.

PAEF most commonly occurs when an atherosclerotic abdominal aortic aneurysm ruptures into the adjacent segment of GI tract. Rarely, a PAEF is caused by aortic wall degeneration due to infection (tuberculosis, syphilis, salmonella, staphylococcus and other mycoses), cervical cancer, colon cancer, radiation therapy, diverticulitis, appendicitis, duodenal ulcers, pancreatitis, cholecystitis and foreign bodies. We thought that a primary aorto-colic fistula occurred after trauma in our patient because of his medical history, age and negative intra-operative cultures.

Primary enteric repair and aortic reconstruction with an in situ Dacron graft are used in cases of aortitis and aortoenteric fistula in the absence of extensive local sepsis, and result in 65% hospital survival and in 13% lethal recurrent hemorrhage. In our case we have used an Intergard Silver knitted bifurcated graft (Intervascular, Datascope Company, France) which is more likely to be resistant to infection. A review of the literature indicates that in most of the cases the bowel was closed primarily and in situ Dacron grafts were used to replace the aorta.

We should like to emphasise that primary

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Fig. 2. Pre-operative view of aortoenteric fistula (white arrow).
aorto-enteric fistula should be considered in patients when a focus for the gastrointestinal hemorrhage cannot be identified. Ultrasonography and a CT scan of the abdomen can greatly assist in establishing the diagnosis and in situ replacement of the arterial segment involved with silver impregnated Dacron graft is a feasible treatment.

References


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