



# Management of a Rare Complication of Abdominal Aortic Repair: Aorto-Enteric Fistula

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## Abstract

Aorto-enteric fistula is an extremely rare complication after abdominal aortic repair that the diagnosis is often challenging and the management is highly difficult. This complication should be suspected in patients who have gastrointestinal symptoms and had gone abdominal aortic intervention in their medical histories. The mainstay treatment of aorto-enteric fistula is early surgery. In this case series, we aimed to present the management of our patients in order to draw the attention of readers to this very rare but serious complication.

**Keywords:** Aorto-enteric; Fistula; Complication; Abdominal aorta

## Introduction

Aorto-Enteric (AE) fistulas are classified into two groups: Primary aorto-enteric fistula is seen rarely due to aggressive management of abdominal aortic aneurysm and secondary aorto-enteric fistula is also a rare and feared late complication of abdominal aorta grafting either due to occlusive disease or an aneurysm. The most common presentation is lower or upper gastrointestinal bleeding and the most common site of fistula formation is the third part of duodenum due to its relatively fixed position and close relation to the aorta. The diagnosis may be difficult and sometimes exploration based upon a high index of suspicion is required [1]. In this particular report, we aimed to present our 3 cases that demonstrate the difficulties in diagnosis and management of aorto-enteric fistulas, and present a current review of the literature.

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## Case Presentation

### Case 1

Thirty-seven years old male patient admitted to our clinic with left femoral exudative discharge. The patient had a history of aorto-bifemoral bypass operation for occlusive arterial disease at three years ago and stem cell implantation for distal (below knee) peripheral arterial disease at 3 months ago. Laboratory exams revealed active infection and abdominal computed tomography (CT) scan was revealed fistula involving a left branch of previous Y-graft and sigmoid colon. Abdominal aorta and grafts were occluded; the distal flow was obtained from collaterals. Inflammatory changes around fistula were observed (Figure-1) during perioperative period, the patient was supported with parenteral nutrition and an antibiotherapy was started according to the culture results of femoral discharge. On the 4<sup>th</sup> day of the treatment, the patient underwent operation and graft was resected, stump on the aorta was ligated and sigmoid colon wall was sutured with Vycril® (Ethicon, New Jersey). On the postoperative 2<sup>nd</sup> day, the patient was taken to ward. On postoperative 7<sup>th</sup> day the patient was discharged and finally on 3<sup>rd</sup>-month exam patient was doing well.

### Case 2

Thirty-year-old female patient admitted to emergency department with abdominal pain. Physical examination revealed a palpable mass in the left upper abdominal quadrant. All four extremity pulses were palpable. The patient had tachycardia on admission. Laboratory exam revealed anemia (htc=%28). She had a history of endovascular aortic repair (EVAR) and thoracic endovascular aortic repair (TEVAR) interventions and abdominal aortic de branching operation for thoracoabdominal aneurysm and abdominal aorta dissection at three weeks ago. CT was revealed abdominal hematoma (Figure-2). During the preoperative period for abdominal exploration, the patient had 2 units of red blood cell packs. Four hours after admission, the patient had cardiac arrest immediately after massive haematemesis and melena. Cardiopulmonary resuscitation (CPR) was not successful. Post mortem examination revealed aorto- enteric fistula between left renal artery and transverse colon.



**Figure 1:** Sagittal plane CT scan showing widespread air densities and thrombosed aortobifemoral graft, collection around the left branch of the graft that is extending to the inguinal region and a fistula between sigmoid colon and graft.



**Figure 2:** Operated abdominal aortic aneurysm, air densities between graft-native aortic wall and aorta-enteric fistula in axial plane CT scans.

### Case 3

Sixty-four years old male patient admitted with lower gastrointestinal bleeding to the emergency department. He had a history of three vessel coronary artery bypass grafting (CABG) 5 years ago and he had a history of abdominal aorta repair operation 3 years ago in another hospital and he was referred to our clinic upon initial consideration. Medical history revealed weight loss of 10 kg in last 3 months and melena for 1 month. Physical examination revealed no pathological findings. Laboratory exams were revealed anemia (htc%28). Trans thoracic echocardiography (TTE) was revealed low left ventricular ejection fraction (LVEF 30%) and biventricular dilatation. The patient had operated urgently for aorto-enteric fistula. Intra operative exploration revealed two aorto-enteric fistulas; first was observed between proximal anastomotic suture line and 3<sup>rd</sup> part



**Figure 3:** Axial CT scan showing ruptured abdominal aortic aneurysm, widespread extravasation of hematoma into the retroperitoneal-intra-abdominal spaces, the graft which is extending from the common iliac artery to abdominal vascular structures.

of jejunum, second fistula involved mid portion of the graft and distal jejunum. Adherences were dissected and during anastomosis, patient failed due to intra operative myocardial infarction and did not respond to CPR (Figure-3).

### Discussion

Aorto-enteric fistula after abdominal aortic reconstruction is a rare condition. This complication occurs with 0.4-3.1% of grafts in abdominal aortic aneurysm (AAA) repair [2,3]. In our series, the incidence of AE fistula (n=3 9.3%) appears more than the incidence that reported in the literature previously. The main reason is that our clinic is a referral center. Two third of cases referred from other centers. Secondary aorto-enteric fistulas may present at the duodenum (81%) or ileum (10%) but are generally proximal to the AAA graft [2]. In addition, extra-graft site infection can result in an infected graft leading to a secondary AE fistula [4]. In our patients, we have observed fistulas involving jejunum, sigmoid and transverse colon. Fistula involving jejunum was observed in a patient with abdominal aortic aneurysm repair. Transverse colon involvement was observed in a patient with occlusive abdominal aorta after graft infection and transverse colon involvement was observed in a patient with AAA after the debranching operation.

Patients generally present with one or more of the following clinical signs and symptoms: gastrointestinal (GI) bleeding (80%), sepsis (44%), abdominal pain (30%), back pain (15%), groin mass (12%) and abdominal pulsatile mass (6%) [5]. Parallel to literature, we have observed similar symptoms, one of our patients admitted with abdominal pain without GI bleeding. Two other had gastrointestinal bleeding. If present, treatment principles of aorto-enteric fistula involve removal of the prosthetic graft, over sewing of the infrarenal aortic stump, closure of the gastrointestinal defect, and revascularization by extra-anatomic means [1]. Antibiotic or silver impregnated grafts may offer an additional advantage. The endovascular approach through EVAR (endovascular aortic revascularization) for inflammatory abdominal aortic aneurysms is becoming the first-line therapy as it leads to improvement of periaortic inflammation [6]. In addition, the endovascular stent graft abolishes the contact between the suture line and the duodenum which was thought to play a major role in the development of aorto-enteric fistulas following open repair of AAA [7]. Aorto-enteric fistula after endovascular repair of abdominal aortic aneurysm occurs in approximately 0.36% of cases [8]. Such a complication has seldom been reported in the literature following repair of an inflammatory abdominal aortic aneurysm and this was attributed to the presence of thick aneurysm wall of inflamed tissues intervening between the aneurysm and surrounding structures. Aorto-enteric fistulas have an overall mortality ranging 56% to 71% [9,10] and in our series, this ratio is found similarly (66.6%).

### Conclusion

Aorto-enteric fistulas usually present with GI bleeding and associated with a high mortality rate if left untreated. A careful history should always be elicited. Aorto-enteric fistulas should be considered in any patient with a history of abdominal aortic repair who presents with GI bleeding. There are numerous diagnostic modalities for AE fistula, but there is not one specific test that depicts AE fistulas. Although there are several intervention options available, none is the gold standard but emergency surgery usually minimizes the mortality.

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