

# A Rare Cause of Gastrointestinal Bleeding: Successful Repair of a Primary Aorto-enteric Fistula

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## ABSTRACT

Aorto-enteric fistula is a surgical emergency with potentially deadly results. Urgent surgical exploration and repair can lower mortality by 50%. Retroperitoneal fibrosis, mycotic aortic aneurysm, and infectious aortitis can mimic this condition on imaging and lead to unfavourable outcomes. Secondary aorto-enteric fistulas are more common, especially after open aortic repair. Endovascular stent graft repair has a safer profile regarding fistula formation. Ectopic air or contrast extravasation confirms aorto-enteric fistula diagnosis but the latter is not routinely used due to its rarity. Imaging usually shows the bowel adhering to the aneurysm sac with inflammation and ectopic gas. Here, we present a 67-year female with a primary aorto-enteric fistula. She underwent open repair of the abdominal aortic aneurysm using a prosthetic graft and primary anastomosis of the intestine.

**Key Words:** *Aorto-enteric fistula, Gastrointestinal bleeding, Aortic aneurysm.*

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## INTRODUCTION

Aorto-enteric fistula is an abnormal communication between the aorta and gastrointestinal tract, either limited to the aorta or involving the aorto-iliac segment. Fistulas are classified as primary or secondary.<sup>1</sup> Primary aorto-enteric fistulas are spontaneous and often caused by intestines compressing against an abdominal aortic aneurysm, with a prevalence of 0.007 per million population.<sup>2</sup> Secondary aorto-enteric fistulas are more common and tend to occur after open repair for abdominal aortic aneurysms.<sup>3</sup> Clinical presentations range from minor gastrointestinal bleeding to life-threatening, catastrophic bleeding leading to death or abdominal pain and pulsatile swelling. Here, we present a case of aorto-enteric fistula in a patient who underwent open repair of an abdominal aortic aneurysm using a prosthetic graft and primary anastomosis of the intestine.

## CASE REPORT

A 67-year woman with a history of chronic kidney disease and hypertension presented to the emergency department with hematemesis, bleeding per rectum, generalised abdominal pain, and loose stools for the past three months.

On physical examination, the patient appeared pale, the abdomen was tender, and bowel sounds were not audible. The blood pressure was 130/76 mm Hg and pulse rate was 98 beats/min. The distal pulses were palpable.

CT scan of abdomen revealed an infra-renal abdominal aortic aneurysm measuring 6.8 × 6.5 × 7.2 cm with circumferential thrombus and small intestine loops adherent to the aneurysm, suggestive of primary aorto-enteric fistula (Figure 1). The patient underwent a midline laparotomy. After getting proximal control and distal control, aneurysm was opened revealing a fistula between the fourth part of the duodenum and postero-medial wall of the aorta (Figure 2). Proximal control was taken below the renal arteries (infra-renal). The fistulous communication was taken down after thoroughly washing out the area, and a bifurcated Dacron graft was used to repair the aorta. Bifurcated Dacron graft was used because the aneurysm was extending upto the bifurcation of the aorta. Proximal anastomosis of Dacron graft to aorta was done using 3-0 Prolene sutures. The limbs were then attached to both the iliacs using 5-0 Prolene sutures. Duodenojejunostomy was performed between the fourth part of duodenum and jejunum using hand-sewn anastomosis with vicryl 3-0 sutures to restore bowel continuity, and abdomen was closed with vicryl sutures, prolene sutures, and staples. The patient had a total clamp time of around 2.5 hours. The reason was that it was imperative to take proximal and distal control first in order to discontinue the fistulous communication and carry out the dissection. One side was perfused after one hour and forty-five minutes and the aforementioned time is the total clamp time. During surgery, six blood transfusions were done and cell saver was used to conserve blood loss.

The patient remained in ICU for 48 hours. After that period, the patient was shifted to the ward and remained there for six days.

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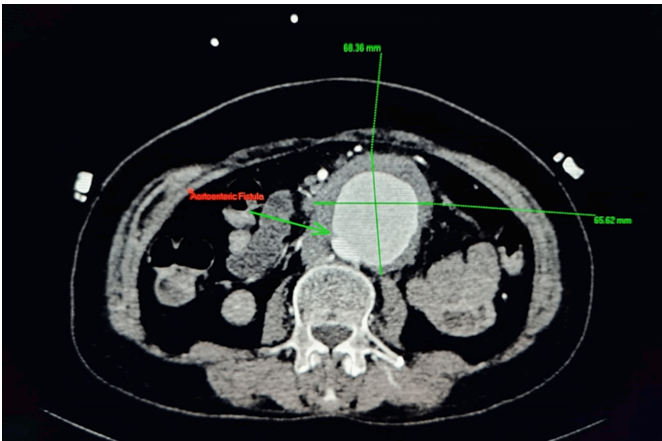
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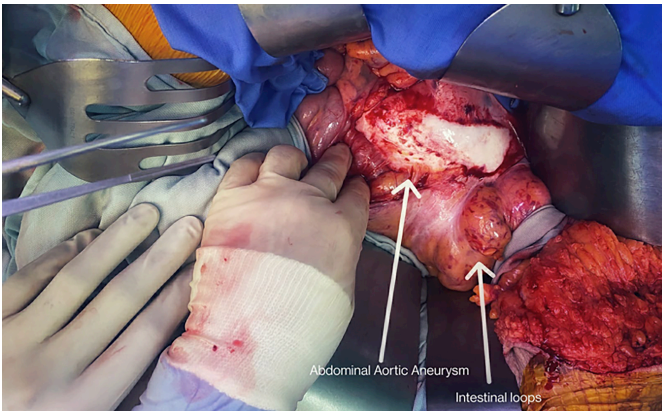
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There was minimal fluid in the drain and the drain was removed after 72 hours. The patient recovered well without any complaints during the follow-up.

The biopsy of the wall showed that it was inflammatory aneurysm. No organisms were isolated from the culture.



**Figure 1:** CT scan shows abdominal aortic aneurysm and the adherent bowel loops.



**Figure 2:** The image shows Intra-operative repair of aorto-enteric fistula.

## DISCUSSION

Aorto-enteric fistula, first described by Sir Astley Cooper in the 19<sup>th</sup> century, is more common than previously thought. In a study of Dutch surgeons by Voorhoeve *et al.*, 27 cases were identified with only four reported in the literature.<sup>4</sup> Modern drug therapies have eliminated tuberculosis and syphilis as causes of fistula but immunocompromised patients remain at risk. Aetiological factors include gastrointestinal ulcers, foreign bodies, diverticulitis, malignancy, mycotic aneurysms, inflammatory aneurysms, and aortic trauma. Inflammatory abdominal aortic aneurysms have also been implicated.<sup>5</sup> This was the aetiology in the present case as well.

Majority of the fistulas form between aorta and the duodenum, usually its third portion. Literature shows that more than 60% of the aorto-enteric fistulas involve duodenum.<sup>6</sup> Pathophysiology suggested for this is that the movement of aneurysmal aorta may erode into the fixed part of the duodenum and intestinal flora can then accelerate the penetrating process. Bacteria,

however, are cultured in only half of the patients, mostly gram-negative, perhaps due to blood flow direction, flushing microorganisms away from the fistula tract. In the present case, the fourth part of the duodenum was involved in the aorto-enteric fistula.

CT is the most sensitive diagnostic method for the aorto-enteric fistula. Still, the recent research suggests that the combination of esophagogastroduodenoscopy (OGD) and CT scans may help diagnose and manage bleeding in hemodynamically stable patients with upper GI bleeding symptoms. In our case, we chose a CT aortogram as the preferred diagnostic modality.

Without treatment, mortality from the aorto-enteric fistula is nearly 100%. Thus, a wait-and-see approach is not advisable. The aorto-enteric fistula has been treated traditionally using the open approach. However, recently, endovascular management is becoming popular either as a permanent solution or as a temporary measure.

Open surgery has the advantage that it completely separates vascular tree from the gastrointestinal tract. Various approaches include *in-situ* graft placement, extra-anatomic bypass, or simple defect closure. *In-situ* Dacron grafts are preferred in cases with minimal contamination.<sup>7</sup> Our case had minimal contamination, so we used an *in-situ* Dacron graft. The minimal contamination was due to early presentation and a thorough wash-out intraoperatively. Autogenous conduits like the femoral and popliteal veins are other options but are not routinely used due to time consumption. Antibiotics may improve outcomes when priming the graft and an omentum can be placed between the intestine and aorta for better results. In cases where there is extensive contamination of the abdominal cavity, an extra-anatomic bypass is preferred. Closure with extra-anatomical bypasses is usually sought for infra-renal aorta cases. The axillary to femoral and femoral to femoral bypass are extra-anatomic options reserved for patients with extensive sepsis and peritonitis.

The endovascular approach is increasingly used for repairing aorto-enteric fistulae, but primary cases have been treated less frequently. Resuscitative endovascular balloon occlusion of the aorta (REBOA) is used to control bleeding in life-threatening haemorrhages and has been shown to improve systolic blood pressure. However, endovascular aortic repair (EVAR) for aorto-enteric fistulae is complicated by infection as the original fistulous communication is not closed and the stent-graft is continuously exposed to the intestinal flora. This along with fear of infection makes open surgery the preferred option.<sup>8</sup> Most surgeons have accepted a bridging approach with early conversion to open repair. A staged combination of EVAR during acute bleeding with aggressive infection control and antibiotics may be a better option for fragile patients.<sup>9</sup> Following endovascular operations, patients may require antibiotics for a longer period and some may need them for life, guided by clinical findings and CT results.<sup>10</sup>

In conclusion, aorto-enteric fistula is a severe and often fatal

condition, despite medical advancements. Diagnosis can be difficult due to various clinical presentations, overlapping symptoms with other gastrointestinal issues, and insidious bleeding episodes. We present the first case report of its kind in Pakistan to remind clinicians to consider aorto-enteric fistula as a possible cause of gastrointestinal bleeding and to maintain a high level of suspicion.

#### **PATIENT'S CONSENT:**

A written informed consent was obtained from the patient.

#### **COMPETING INTEREST:**

The authors declared no competing interest.

#### **AUTHORS' CONTRIBUTION:**

FN, TK: Drafting of the manuscript.

OE: Conception of design and revision of the manuscript.

MIK: Revision of the manuscript.

TT: Interpretation of data.

All the authors have approved the final version of the manuscript to be published.

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