

# Primary Aortoduodenal Fistula

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## Abstract

Primary aortoduodenal fistula is a rare cause of gastrointestinal bleeding that is difficult to diagnose. A "herald" bleed often precedes fatal hemorrhage. Endoscopy, ultrasound, angiography and CT scan have all been utilized in an attempt to confirm this diagnosis with limited success. We report a 51-year-old male who presented with occasional melanotic stools, and then developed massive upper gastrointestinal bleeding. A primary aortoduodenal fistula was identified between an atherosclerotic abdominal aortic aneurysm, and the third portion of the duodenum in surgery. The aneurysm was resected and grafted and the duodenum repaired. The patient developed a severe coagulopathy and expired post-operatively. This case illustrates a rare presentation of both abdominal aortic aneurysm and gastrointestinal bleeding. We will discuss the challenges in diagnosis and management of this unusual problem.

## INTRODUCTION

Primary aortoduodenal fistula (PADF) is a communication between the aorta and the enteric tract without any previous vascular intervention, e.g., aortic grafting. Although rare, PADF is a lethal condition that requires a high index of suspicion. Delay in diagnosis and treatment has been historically associated with extremely high mortality.

We present a case of PADF due to an abdominal aortic aneurysm. Diagnosis was made at surgical exploration. Despite the use of angiography, and repeated computed tomography (CT) scans, the diagnosis of a PADF secondary to an abdominal aortic aneurysm is often difficult to make, leading to a delay in diagnosis until the time of surgery [2]. This extremely rare condition requires a high index of clinical suspicion even in a patient with undiagnosed aortic disease.

## CASE REPORT

A 51-year old male presented to the emergency room with a chief complaint of rectal bleeding. The patient reported intermittent bleeding for one year which had worsened over the past two days. He also reported feeling "dizzy" with occasional bright red blood per rectum.

PMH was significant for hypertension, non-insulin dependent diabetes, peptic ulcer disease, GERD, and osteomyelitis of his cervical spine. No surgical history. Current medications included Glucophage, Lipitor, and

Lisinopril. No history of drug, alcohol or tobacco use. Review of systems was otherwise non-contributory.

The patient appeared in mild distress, was well hydrated, alert and oriented heart rate 108, blood pressure 106/61 with no orthostatic changes. Pulses were palpable at 2+ throughout. Abdomen was soft and mildly tender in the epigastrium. Rectal exam revealed gross blood.

Lab work was unremarkable except for hemoglobin of 11g/dl and BUN/Cr 33/1.4. A nasogastric tube was placed. His stomach was lavaged with no blood. The patient was admitted with the diagnosis of GI bleeding of unknown etiology. EGD was performed which showed mild gastritis and duodenitis but no bleeding. Two days later the patient passed another 500ml of melana, received two units of PRBC and underwent colonoscopy which was unremarkable. His bleeding stopped and a subsequent barium small bowel study failed to show a mass or lesion. Plans were made for CT/ angiogram.

Day six after admission, the patient had abdominal pain, a large upper GI bleed and melena. Repeat EGD showed a large clot in the third portion of the duodenum. Exploratory laparotomy revealed a communication between the aorta and third portion of the duodenum. The aneurysm was resected and grafted and the duodenum repaired. Unfortunately, the patient developed severe coagulopathy and expired six hours postoperatively.

**DISCUSSION**

The most common site of aortoenteric fistulization is at the third portion of the duodenum because of its fixed retroperitoneal location overlying the aorta. While this condition is extremely rare with an incidence rate at autopsy of 0.04 to 0.07%, secondary ADF occurs much more commonly (post-operative incidence -0.5 to 2.3%), and is due to prior aortic surgery and/or the placement of a synthetic aortic graft.

Endoscopic evaluation of patients with aortoenteric fistulae has been shown to reveal a multitude of findings ranging from gastrointestinal erosions, granulation tissue/ pulsatile mass in the distal duodenum, to ulceration with or without adherent clot. EGD findings remain nonspecific for a PADF. The fourth part of the duodenum must be visualized during imaging to increase the diagnostic yield], bearing in mind that the majority of fistulae occur in the third and fourth portions of the duodenum.

Of note was the fact that on examination of the abdomen there was no palpable mass. A small aneurysm in a normal sized patient that simply could not be palpated resulted in the pathology. Had an aneurysm been palpable with the pattern of bleeding that he had, the possible diagnosis of a PADF may have been thought of sooner.

Previous authors have proposed the initial evaluation of gastrointestinal bleeding with EGD to be followed by CT, and if there is consistent evidence of bleeding without an identifiable source, an angiogram should be considered. Technological advances in imaging have left CT imaging as the preferred initial diagnostic test with a reported sensitivity as high as 93% in diagnosing aortoenteric fistulas. For successful management the medical team is required to have

knowledge of several forms of presentation in order to avoid diagnostic delay.

Commonly used diagnostic tools in the evaluation of patients with PADF include:

**Figure 1**

Table 1. Diagnostic tools used in 81 patients with PADF, with detection rate, reproduced from Saers and Schetinga, 2005 [1]

	Number of Patients	Detection Rate (%)
Gastroduodenoscopy	59	25
Computed tomography	49	61
Arteriography	31	26
Ultrasonography	13	0
Colonoscopy	10	10
Enteroclysis	8	13
Technetium scan	7	14
Angiography	3	0

**LEARNING POINTS**

- PADF can include intermittent gastrointestinal bleeding, making the diagnosis in the non-bleeding interval difficult
- The triad of abdominal pain, pulsatile mass and GI bleeding is rarely seen
- The most frequent presenting sign of PADF is upper gastrointestinal bleed
- CT scan and endoscopy are the most useful diagnostic modalities to confirm the diagnosis
- In patients with severe gastrointestinal bleeding, and a history of aortic disease (aneurysm, prior aortic graft repair, stenting, or potentially no aneurysmal aortic history), an ADF should be suspected, in spite of negative results of endoscopy and CT

**References**

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