CASE REPORT PEER REVIEWED | OPEN ACCESS

Primary right ileocolic arterial fistula: A case report

Andrew C. Gaugler, Martin J. Carney, Adam R. Turnock, Brian P. Fleischer, Wesley B. Vanderlan

ABSTRACT

Introduction: We present the first reported case of a primary ileocolic fistula occurring in an 89- year-old male. Case Report: The patient presented with abdominal pain and massive hematochezia. Subsequent radioimaging revealed an aneurysm of the right common iliac densely adherent to the sigmoid colon. A left to right femorofemoral bypass between the proximal right common femoral artery to the left common femoral artery was constructed using a cryopreserved human aorta. Recovery was uncomplicated and the patient was discharged to home on postoperative day #11. Conclusion: Iliac-enteric fistula is a daunting cause of gastrointestinal bleeding that carries a high mortality. While vascular reconstruction and bowel resection has been the treatment of choice, endovascular therapy may be a viable option for future cases.

Keywords: Arterioenteric fistula, Primary arterioenteric fistula, Secondary arterioenteric fistula

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INTRODUCTION

Fistulae between major arteries present a unique challenge to the vascular surgeon. They are rare, difficult to diagnose, and associated with a high mortality rate [1–2]. Most arterio-enteric fistulae arise in the setting of previous vascular intervention and are termed secondary arterioenteric fistulae [1]. Fistulae arising from native arteries are rare but do occur and are termed primary arterioenteric fistulae. Due to the infrequency of primary arterioenteric fistulae, the ideal management is not standardized and remains unproved [1]. We present the first reported case of a primary fistula between the right common iliac and sigmoid colon.

CASE REPORT

An 89-year-old Caucasian male with a past medical history of hypertension, cerebrovascular disease, and previous thoracic aortic dissection treated with medical management presented to the emergency department of a rural community hospital with a one-day history of lower abdominal pain and massive hematochezia. Initial onset of pain began following a single episode of hematochezia. Symptoms progressed over the course of approximately

two hours to frank hematochezia and marked left lower quadrant and suprapubic pain. Urgent intravenous contrasted only computed tomography (CT) of abdomen and pelvis abdomen and pelvis revealed a 6 cm right common iliac artery aneurysm with adherent sigmoid colon and fluid within the colon consistent with blood (Figure 1). This finding was diagnosed as an iliac artery aneurysmal rupture. The patient was transfused one unit of packed red blood cells, nitroprusside and esmolol infusions were begun, and the patient was transferred to our institution.

Upon arrival to our emergency department the patient was tachycardic but normotensive. The abdomen was slightly distended and suprapubic tenderness without rebound or guarding was appreciated. Distal pulses were weakly palpable (1/2) along the dorsalis pedis artery. Hemoglobin was 7.6 mg/dl. Emergent release of blood was ordered and the patient was transferred emergently to the operating room.

Hypotension resulted with anesthetic induction. 200 μg of intravenous phenylephrine was immediately provided for blood pressure intervention followed by three units of emergently transfused packed red blood cells. Access to the iliac fossa was afforded through a generous midline laparotomy. Infrarenal aortic control was first achieved with an aortic clamp. Right common iliac control was then achieved and aortic clamp. Distal control was then gained at both common femoral arteries with vessel loops. Systemic anticoagulation was then afforded using 7500 units of bolused heparin. Cryopreserved human aorta was then used to construct a left to right femorofemoral bypass between the proximal right common femoral artery to the left common femoral artery. Anastomosis was performed in end–to–side fashion using 5–0 Prolene. The right common iliac aneurysm was then opened widely and a large fecal contaminated thrombus was evacuated. Control of back – bleeding from the internal iliac artery was obtained with suture ligation using 5–0 Prolene. Culture of the evacuated thrombus returned positive for *Escheria coli* and *Streptococcus viridans*.

Attention was then directed to the sigmoid colon densely adherent to the aneurysm sac. The mesoappendix was intimately involved necessitating attendant appendectomy. Appendectomy was performed using a gastrointestinal anastomotic (GIA) stapling device. Identification of the sigmoidal fistulous defect lead to segmental resection using a GIA stapler. Damage control laparotomy techniques were elected due to the patient's acidosis, hypothermia, coagulopathy, intraoperative hemorrhage, and transient hypotension. Temporary abdominal closure was afforded using ABThera Open Abdomen Negative Pressure Therapy (Kinetic Concepts, Inc., San Antonio, Texas) and the patient was transferred directly to the surgical intensive care unit (SICU) for resuscitation. Intravenous piperacillin/tazobactam at 3.375 g every 4 hours with vancomycin 15 mg/kg (1250 mg) every 12 hours were continued until the date of discharge. Following resuscitation, the patient returned to the operating room on postoperative day-3 where he received an end sigmoid colostomy with primary fascial closure. The surgical wound was affixed with VERSAFOAM (Kinetic Concepts, Inc., San Antonio, Texas) and continuous Wound V.A.C (Kinetic Concepts, Inc., San Antonio, Texas) therapy at 75 mmHg. Delayed primary closure (DPC) was performed prior to discharge on hospital day-11. The recovery of the patient was uneventful.

DISCUSSION

Arterioenteric fistulae are an exceedingly rare cause of gastrointestinal bleeding and are classified as either primary or secondary. Primary fistulae arise in native diseased arteries and are rarer than secondary fistulae that develop in association with pseudoaneurysms or vascular anastomoses following vascular reconstruction. Most primary and secondary fistulae occur between the aorta or an aortic graft and the duodenum [1]. Although

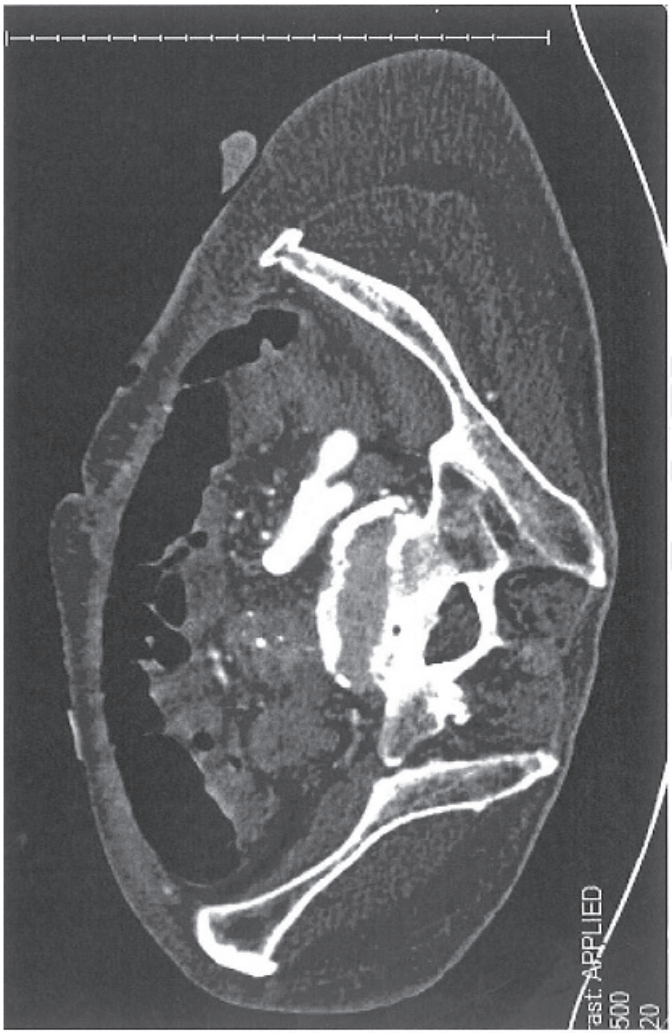

Figure 1: Computed tomography imaging of ilio-sigmoid colonic fistula.

quite rare, fistulae may also arise from the iliac artery and its branches [2]. Since 2003, only 12 cases of ilioenteric fistulae have been reported [3–10]. The patient presented herein constitutes the first known reported case of right iliac artery to sigmoid colon fistula.

Iliac artery aneurysms are a well-described in the medical literature. Autopsy reports from the early 20th century estimate the prevalence at 1 in 12,000 [11]. Aneurysmal disease predominantly affects the common iliac arteries (89%), followed by the internal (10%) and the external (1%) branches. Rupture is by far the most common complication of iliac artery aneurysm [11], followed by symptomatic compression of adjacent pelvic structures [12]. Fistulae involving iliac artery aneurysms have been described but the risk of developing an ilioenteric fistula with an iliac artery aneurysm has not been described. The patient in this report appeared to have developed an iliac artery aneurysm from atherosclerosis. No evidence of diverticular disease was present either grossly or on pathologic examination of the resected specimen. There was also no history of pelvic malignancy, prior vascular anastomosis, pelvic radiation or prior colonic resection.

Of the reported cases involving primary ilioenteric fistulae since 2003 [3–10], all patients presented with massive lower gastrointestinal bleeding. Paralleling the natural history of aneurysmal disease, most patients present in the 6th or 7th decade of life and the incidence of vessel involvement mirrors that of aneurysmal disease with common iliac artery most frequently involved, followed by the external and internal branches [3]. Ilioenteric fistulae preferentially involve the right iliac artery and branches more frequently than the left [6]. Enteric sites demonstrated no particular preference being evenly distributed between the rectosigmoid colon, right colon/cecum, and the ileum. Most cases are diagnosed based on CT with IV contrast or emergent angiography for attempted localization of lower gastrointestinal bleeding [7]. Our patient demonstrated the more common right iliac artery involvement but uniquely involving the sigmoid colon. Diagnosis using intravenous only contrasted CT appears sufficient in our patient as the addition of oral contrast was not considered necessary and delaying operative treatment for further imaging was judged inappropriate given the clinical suspicion of impending patient instability. We believe vascular–enteric fistulae are best recognized and treated as surgical emergencies akin to pure vascular rupture.

Common iliac-enteric fistulae are most frequently associated with aneurysmal disease, with other causes attributed to malignancy and inflammatory bowel disease [1]. Internal and external iliac fistulae appear to have a predilection for the rectum and most reported cases were associated with previous pelvic malignancy and radiation.

Of twelve reported cases, eight were treated with an endovascular stent graft, three with open repair, and one staged endovascular and open procedure [3–10]. Open techniques consisted of primary arterial repair with bowel resection (Crohns, Typhilitis), staged stent graft with Hartmann's, and vascular reconstruction with graft and bowel resection. Endovascular approaches consisted of stent grafts with or without coiling of iliac branches. Overall mortality regardless of technique approaches 50% and is likely related to hemorrhagic shock, a process that is poorly tolerated in the vasculopathic patient [2].

CONCLUSION

Iliac-enteric fistula remains a daunting cause of gastrointestinal bleeding and carries a 50% risk of mortality. Most arise from either aneurysmal disease or pelvic malignancy with a history of radiation. Diagnosis can be aided by CT or angiography, but may not be possible in the face of exsanguinating hemorrhage. Though vascular reconstruction and bowel resection has been the treatment of choice, endovascular therapy may be a viable option for this uncommon and deadly process.

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Author Contributions

Andrew C. Gaugler – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Martin J. Carney – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Adam R. Turnock – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Brian P. Fleischer – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published
Wesley B. Vanderlan – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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