

Case Report

An Insidious Gastrointestinal Bleeding from Secondary Aortoduodenal Fistula Leading to Septic Shock

Ahmad Khan ¹, Ejaz Ahmad,² Saad Javaid,² and Mohamed Riad Sankari³

¹West Virginia University-Charleston Division, Charleston, WV, USA

²Nishtar Hospital Multan, Pakistan

³Charleston Area Medical Center, Charleston, West Virginia, USA

Correspondence should be addressed to Ahmad Khan; ahmad.khan1@hsc.wvu.edu

Received 6 March 2019; Accepted 19 April 2019; Published 13 May 2019

Academic Editor: Gregory Kouraklis

Copyright © 2019 Ahmad Khan et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Insidious gastrointestinal bleeding from a secondary aortic fistula poses a significant diagnostic challenge. Failure to recognize it early on can lead to devastating outcomes. We describe a case of insidious gastrointestinal bleeding from a secondary aortic fistula in an elderly woman who presented with recurrent admissions for melanotic stools and eventually developed septic shock. Esophagogastroduodenoscopy did not reveal any obvious source of bleeding. The patient eventually had push endoscopy that revealed infected graft and a secondary aortoduodenal fistula. One should proceed with push enteroscopy in occult bleeding if the patient has a history of abdominal aortic aneurysm repair.

1. Introduction

A secondary aortoduodenal fistula (SAEF) is an uncommon complication of abdominal aortic aneurysms (AAA) repair surgeries [1]. Rarely, it manifests as insidious gastrointestinal bleeding that can lead to the infection of the graft; therefore, we suggest that a high index of suspicion as a failure to recognize it early on can result in considerable morbidity and mortality [2, 3]. We present a case of secondary aortoduodenal fistula after abdominal aortic aneurysm repair presented as slow recurrent gastrointestinal bleeding over several months leading eventually to infection of the graft and septic shock.

2. Case Report

A 74-year-old female presented to the emergency department (ED) with upper abdominal pain and melanotic stools. She had an elective open juxtarenal abdominal aortic aneurysm repair a month before her index presentation. She was hemodynamically stable. Her pertinent initial labs showed a hemoglobin of 6.7 g/dl (baseline 9.6 g/dl) with a hematocrit of 23%. Patient did not have any fever or leukocytosis. A CT abdomen with contrast done in the ED for abdominal

pain showed nonspecific findings, i.e., irregularity of the “aneurysmal sac” with a small amount of fluid around the sac (see Figure 1) which was read by the radiologist as early postsurgical changes. She was admitted and was started on proton pump inhibitors. An esophagogastroduodenoscopy (EGD) was performed that revealed mild duodenitis. Her hemoglobin remained stable the next couple of days, and she was discharged home with a 6-8-week course of proton pump inhibitors. Two months later, she presented again with similar complaints with a drop of hemoglobin. A repeat EGD was performed that did not reveal any obvious source of bleeding, and she was discharged home after stabilization.

A month later, she came for the third time into the ED with abdominal pain, hematochezia, and profound hypotension. Her pertinent laboratory findings include leukocytosis, low hemoglobin and hematocrit, thrombocytopenia, and transaminitis. She was resuscitated with IV fluids and blood transfusions. She was started on broad spectrum antibiotics after blood cultures were drawn. A CT abdomen and pelvis was performed which showed tiny foci of air at the anterior aspect of the native aneurysm wrap just inferior to the location where duodenum crosses (see Figure 2). At that time, a decision was made to perform push enteroscopy instead of

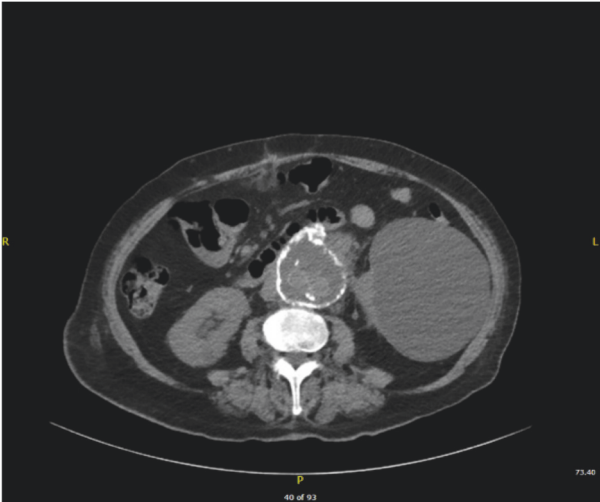


FIGURE 1: Computed tomography of abdomen showing nonspecific findings, irregularity of the “aneurysmal sac” with a small amount of fluid around the sac.

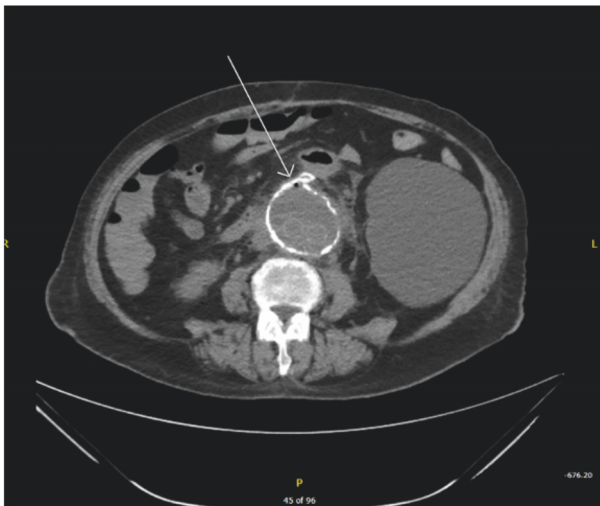


FIGURE 2: Computed tomography of abdomen showing tiny foci of air at the anterior aspect of the native aneurysm wrap just inferior to the location where the duodenum crosses.

simple EGD to evaluate second and third portion of duodenum which showed an aortoduodenal fistula with infected graft adherent to the bowel wall and extruding purulent exudate (see Figure 3). She underwent emergent surgical excision of the infected graft and bypass grafting to restore vasculature. Her blood cultures and cultures from the graft revealed methicillin-resistant *Staphylococcus aureus* (MRSA) and *Streptococcus agalactiae*. Aggressive management was continued with proper antibiotics in the intensive care unit, but her condition deteriorated, and she expired within several days.

3. Discussion

Secondary aortoenteric fistula (SAEF) is an infrequent complication following any aortic reconstruction surgery. It

results from mechanical erosion of the prosthetic graft or suture material into the surrounding bowel and sometimes even stent graft infection itself predisposes to erosion of the adherent bowel wall. The overall incidence reported is between 0.36% and 1.6% with the most common location to develop is the third and fourth parts of the duodenum due to its retroperitoneal location and proximity with the graft. The literature review demonstrated that more than 75% of cases are seen in the third and fourth part of the duodenum, followed by the 5% cases involving colon and less than 2% involving cecum. The risk factors include old age with median age of 65 years or above, male gender, and choice of procedure such as endovascular versus open and emergent versus nonemergent [3, 4].

The clinical presentation varies significantly and depends on the type of fistula, i.e., primary or secondary, and usually presents with gastrointestinal bleeding of any magnitude with melena in 54% and hematemesis in 41% cases, unexplained abdominal pain in 21% cases or graft infection and sepsis in 12% cases [5, 6]. The bleeding ranges from slow occult bleeding, i.e., minor herald bleed as seen in our patient, which can be self-limiting or can result into massive exsanguinating hemorrhage [7, 8]. The herald bleed poses a significant diagnostic challenge and can lead to graft infection and septic shock if not recognized early on as seen in our patient.

The diagnostic workup depends on the patient's hemodynamic status but should always be preceded with a detailed history and physical examination. A previous history of aortic reconstruction should always alert physicians about the possibility of SAEF associated bleeding. Computed tomography (CT) of the abdomen with contrast enhancement or a CT angiography (CTA) is the most frequent initial diagnostic test. The diagnostic yield of CT abdomen itself is low but can show any indirect evidence such as focal bowel wall thickening, gas or a collection surrounding the graft in case of infection [9–11]. CT mesenteric angiography (CTA) is superior to CT abdomen as it helps to visualize the aortic lumen itself and can demonstrate any extravascular collections or active contrast extravasation [12]. EGD is routinely done as a next step to rule out other sources of GI bleed. However, EGD can only localize the graft material or even pus inside the bowel only in less than 25% cases. However, its accuracy beyond the 2nd portion of the duodenum is limited, and a duodenoscope or push enteroscopy is used to evaluate the third and fourth parts of the duodenum [13–15]. In case of slow chronic bleed, the suture line or graft material can become a nidus of infection and can lead to sepsis and septic shock as seen in our case. When infection of the graft is suspected, 18-fluorodeoxyglucose positron emission tomography (18- FDG PET) scan or tagged white blood cell scan (WBC scan) can help to locate the source of infection. WBC scans have excellent sensitivity in the diagnosis of infected grafts in the early postoperative period, as 18- FDG PET scan can demonstrate false positive results [16–18].

The management of SAEF associated GI bleeding typically involves initial resuscitation, hemodynamic support, use of broad-spectrum antibiotics in case of infection, and early aortic repair [19]. An aortic repair is done through either open or endovascular approaches and includes vascular control,

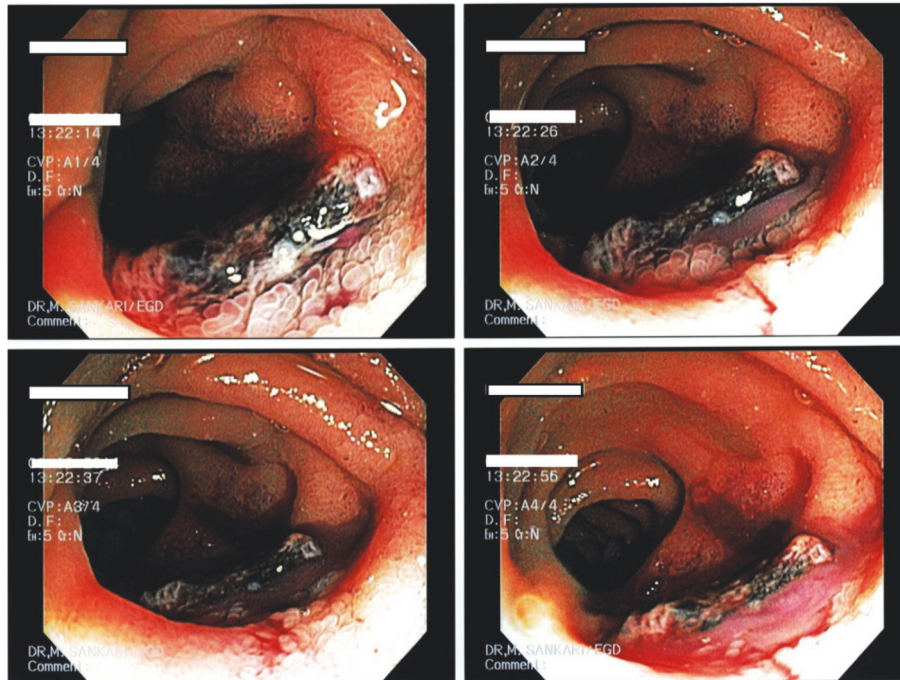


FIGURE 3: Push enteroscopy showing infected graft with purulent exudate extruding from an aortoduodenal fistula.

removal of infected or necrotic tissue, restoration of gastrointestinal continuity, and revascularization to restore the blood flow of the lower extremities. Endovascular options include endovascular balloon occlusion of the aorta, endovascular coil embolization, and stent-graft repair [20]. The major complications after an open repair include recurrence of fistula, aortic stump disruption, and recurrent infection. The prognosis is dependent on the early diagnosis and prompt surgical treatment which may prevent mortality of up to 80% [21].

The number of aortic reconstruction surgeries has been increasing due to improved screening methods and early diagnosis. Our case highlights the importance of maintaining a high index of suspicion even if the initial EGD is negative and one should proceed with push enteroscopy as failure to recognize it will lead to the devastating outcomes.

Consent

Patient is deceased. All attempts have been exhausted in trying to contact the next of kin for informed consent to publish their information, but consent could not be obtained.

Disclosure

Ahmad Khan is the article guarantor. The case was presented as a poster in The World Congress of Gastroenterology at ACG2017.

Conflicts of Interest

The authors have no conflicts of interest to disclose.

Authors' Contributions

Ahmad Khan, Ejaz Ahmad, and Saad Javaid were responsible for original draft. Mohamed Riad Sankari was responsible for reviewing and editing.

References

- [1] M. Tagowski, H. Vieweg, C. Wissgott, and R. Andresen, "Aortoenteric fistula as a complication of open reconstruction and endovascular repair of abdominal aorta," *Radiology Research and Practice*, vol. 2014, Article ID 383159, 6 pages, 2014.
- [2] M. C. Champion, S. N. Sullivan, J. C. Coles, M. Goldbach, and W. C. Watson, "Aortoenteric fistula. Incidence, presentation recognition, and management," *Annals of Surgery*, vol. 195, no. 3, pp. 314–317, 1982.
- [3] T. Simon and E. Feller, "Diverse presentation of secondary aortoenteric fistulae," *Case Reports in Medicine*, vol. 2011, Article ID 406730, 3 pages, 2011.
- [4] D. Bergqvist, "Arterioenteric fistula. Review of a vascular emergency," *Acta chirurgica Scandinavica*, vol. 153, no. 2, pp. 81–86, 1987.
- [5] I. I. Pipinos, J. A. Carr, B. E. Haithcock, P. V. Anagnostopoulos, C. D. Dossa, and D. J. Reddy, "Secondary aortoenteric fistula," *Annals of Vascular Surgery*, vol. 14, no. 6, pp. 688–696, 2000.
- [6] S. W. Nagy and J. B. Marshall, "Aortoenteric fistulas. Recognizing a potentially catastrophic cause of gastrointestinal bleeding," *Postgraduate Medical Journal*, vol. 93, no. 8, pp. 211–222, 2016.
- [7] N. Saratzis, A. Saratzis, N. Melas, K. Ktenidis, and D. Kiskinis, "Aortoduodenal fistulas after endovascular stent-graft repair of abdominal aortic aneurysms: single-center experience and review of the literature," *Journal of Endovascular Therapy*, vol. 15, no. 4, pp. 441–448, 2008.

- [8] G. Geraci, F. Pisello, F. Li Volsi et al., "Secondary aortoduodenal fistula," *World Journal of Gastroenterology*, vol. 14, no. 3, pp. 484–486, 2008.
- [9] R. N. Low, S. D. Wall, R. B. Jeffrey Jr., R. A. Sollitto, L. M. Reilly, and L. M. Tierney Jr., "Aortoenteric fistula and perigraft infection: evaluation with CT," *Radiology*, vol. 175, no. 1, pp. 157–162, 1990.
- [10] F. M. Hughes, D. Kavanagh, M. Barry, A. Owens, D. P. MacErlaine, and D. E. Malone, "Aortoenteric fistula: a diagnostic dilemma," *Abdominal Imaging*, vol. 32, no. 3, pp. 398–402, 2007.
- [11] K. D. Hagspiel, U. C. Turba, U. Bozlar et al., "Diagnosis of aortoenteric fistulas with CT angiography," *Journal of Vascular and Interventional Radiology*, vol. 18, no. 4, pp. 497–504, 2007.
- [12] F. J. Perks, I. Gillespie, and D. Patel, "Multidetector computed tomography imaging of aortoenteric fistula," *Journal of Computer Assisted Tomography*, vol. 28, no. 3, pp. 343–347, 2004.
- [13] K. Xiromeritis, I. Dalainas, M. Stamatakos, and K. Filis, "Aortoenteric fistulae: Present-day management," *International Surgery*, vol. 96, no. 3, pp. 266–273, 2011.
- [14] A. Singh, V. Baptista, C. Stoicov, and D. R. Cave, "Evaluation of small bowel bleeding," *Current Opinion in Gastroenterology*, vol. 29, no. 2, pp. 119–124, 2013.
- [15] L. B. Gerson, J. L. Fidler, D. R. Cave, and J. A. Leighton, "ACG clinical guideline: diagnosis and management of small bowel bleeding," *American Journal of Gastroenterology*, vol. 110, no. 9, pp. 1265–1287, 2015.
- [16] R. H. Ganatra, M. A. Haniffa, A. B. Hawthorne, and J. I. S. Rees, "Aortoenteric fistula complicating an infected aortic graft diagnosis by leukocyte scintigraphy," *Clinical Nuclear Medicine*, vol. 26, no. 9, pp. 800–801, 2001.
- [17] H. Balink and M. M. P. J. Reijnen, "Diagnosis of abdominal aortic prosthesis infection with FDG-PET/CT," *Vascular and Endovascular Surgery*, vol. 41, no. 5, pp. 428–432, 2007.
- [18] L. Burrioni, C. D'Alessandria, and A. Signore, "Diagnosis of vascular prosthesis infection: PET or SPECT?" *Journal of Nuclear Medicine*, vol. 48, no. 8, pp. 1227–1229, 2007.
- [19] C. S. O'Mara, G. M. Williams, and C. B. Ernst, "Secondary aortoenteric fistula. A 20 year experience," *The American Journal of Surgery*, vol. 142, no. 2, pp. 203–209, 1981.
- [20] C. D. Karkos, P. A. Vlachou, P. D. Hayes, G. Fishwick, A. Bolia, and A. R. Naylor, "Temporary endovascular control of a bleeding aortoenteric fistula by transcatheter coil embolization," *Journal of Vascular and Interventional Radiology*, vol. 16, no. 6, pp. 867–871, 2005.
- [21] E. Bastounis, E. Papalambros, V. Mermingas, C. Maltezos, T. Diamantis, and P. Balas, "Secondary aortoduodenal fistulae," *Journal of Cardiovascular Surgery*, vol. 38, no. 5, pp. 457–464, 1997.



Hindawi

Submit your manuscripts at
www.hindawi.com

