Massive Hematochezia in a Patient With a Previously Repaired Abdominal Aortic Aneurysm

Carlo J. Puzzo, DO¹; Stephen R. Gallo, MD¹; Mohammed Abdallah, DO²
From ¹Nova Southeastern University, Fort Lauderdale, Florida, and ²Broward Health, Fort Lauderdale, Florida.

ABSTRACT: Several recent studies compare different open approaches as well as open and endovascular approaches to secondary aortoenteric fistula (SAEFs). Although statistically significant data were discovered in these studies, the practical approach to SAEFs remains challenging. Herein we describe an operative technique, which included both an endovascular approach as well as an open approach, and discuss the results of current research.

VASCULAR DISEASE MANAGEMENT 2016;13(3):E75-E78
Key words: abdominal aortic aneurysm, aneurysm repair, aortic aneurysm stent graft, vascular surgery

This case report describes the emergent repair of an infected abdominal aortic graft with a secondary aortoenteric fistula (SAEF) in a patient who had undergone open abdominal aortic aneurysm (AAA) repair 7 years prior to presentation. Recent studies have compared different open approaches as well as open and endovascular approaches. While statistically significant data were discovered in these studies, the practical approach to SAEFs remains challenging. This case describes an operative technique, which included both an endovascular approach as well as an open approach, and discusses the results of current research. Consent to publish was obtained from the patient for scientific research and educational purposes provided identity is not revealed.

A 79-year-old white female presented to our emergency department (ED) with a chief complaint of rectal bleeding of 1 day duration. Her past medical history was significant for a previously repaired abdominal aortic aneurysm (AAA) in 2006. Upon questioning, she admitted to frank red blood in the toilet, fatigue, and dizziness. She denied abdominal pain, rectal pain, fever, sick contacts, recent travel, and consumption of unusual foods. Current medications included clopidogrel, lasix, and alprazolam. She stated that her father had an “aneurysm,” she lived at home with her husband, denied alcohol and tobacco use, and was allergic to sulfadiazine.

In the ED she was tachycardic, tachypnic, and hypotensive. Physical examination was notable for pale conjunctiva, sinus tachycardia, diminished peripheral pulses, and delayed capillary refill. However, her abdomen was soft with only mild tenderness to palpation in the epigastric and periumbilical region, peritoneal signs were absent.
Laboratory studies done in the ED revealed a white blood cell count of $23.33 \times 10^3$/uL with 92% neutrophils, hemoglobin of 8.8g/dL, hematocrit of 27.5%, normal red cell indices, platelet count of $367 \times 10^3$/uL, coagulation studies were within normal limits (WNL), electrolytes were WNL, blood urea nitrogen of 13mg/dL, creatinine of 1.1mg/dL, and glucose of 168mg/dL. Fecal occult blood was positive and an arterial blood gas showed a mild respiratory alkalosis.

Abdominopelvic computed tomography (CT) with intravenous (IV) contrast revealed an infrarenal aortic graft with rim enhancement and 2 pockets of air in the aortic wall; however, there was no evidence of contrast extravasation into the bowel. Additionally, small bowel thickening was seen abutting the abdominal aorta, and sigmoid diverticulosis was present. At this point, the presumptive diagnosis was an infected aortic graft with SAEF and the patient was emergently taken to the operating room.

**OPERATIVE APPROACH**

In the operating room, repair of the infected graft and SAEF began endovascularly with deployment of an endograft below the right renal artery via right femoral artery access for the purpose of controlling and preventing bleeding. Next, the abdomen was opened with a midline incision from xiphoid to pubis, adhesions were taken down as they were encountered and the retroperitoneum was accessed and exposed. On gross examination, it was noted that a loop of small bowel was adherent to the graft and there was an erosion at the proximal anastomosis which was covered by the recently deployed endograft. The mid portion of the graft was grossly infected and excised to prepare for an interpositional graft. Additionally, the distal graft anastomosis was found to be totally disrupted and consequently had to be excised, along with a portion of the distal abdominal aorta to ensure uninfected margins, the distal aorta was subsequently oversewn. With the entire portion of the infected graft removed, the endograft was trimmed and a 22 bifurcated graft (soaked in antibiotic saline solution) was prepared to perform an aortobifemoral bypass. This was done with a proximal end-to-end anastomosis and distal end-to-side anastomoses. Nonadherent mesh and omentum were placed over the aorta and graft to prevent future adhesions. Attention was then turned to the small bowel, which had a perforation in the anterior portion of the jejunum just distal to the ligament of Trietz, this was closed with 3-0 Vicryl. The abdomen was copiously irrigated with antibiotic saline solution and closed in layers.

**POSTOPERATIVE HOSPITAL COURSE**

The patient received broad-spectrum IV antibiotics with coverage for enteric organisms while tissue cultures were pending. Graft cultures were positive for penicillin-susceptible Streptococcus aginosus and blood cultures remained negative throughout her hospital course. During recovery she had a mild postoperative ileus, which was managed conservatively. The patient was discharged in stable condition.

**DISCUSSION**

Secondary aortoenteric fistulas are the most disastrous complication of abdominal aortic aneurysm repair with a mortality of 100% if left untreated. Operative intervention is mandatory; however, intraoperative and postoperative mortality continues to remain high in
spite of the surgeon’s best efforts. Over the past several years, comparative studies analyzing the outcomes of open and endovascular repair of SAEFs have been published.

In 2011, Batt et al published their study comparing the results of in-situ revascularization (ISR) to extra-anatomical reconstruction (EAR).1 They demonstrated that operative mortality was correlated only with patient age (>75 years); however, there was no significant difference in operative mortality between ISR and EAR. When comparing short-term morbidity (acute limb ischemia, abdominal fascia dehiscence, anastomotic rupture, existence of groin wound), there was again no statistically significant difference between ISR and EAR. The authors also found no significant difference in graft patency between ISR and EAR at 1, 3, and 5 years. When analyzing recurrence of infection, not only was there no significant difference between ISR and EAR, but partial vs total graft resection and duodenorraphy vs segmental duodenal resection were not significantly different. With axillo-bifemoral bypass traditionally being the gold standard of SAEF repair, the authors of this study objectively questioned its superiority and offered an equivalent modality.

Another study by Kakkos et al, published in 2010, compared open SAEF repair (O-SAEFR) to endovascular SAEF repair (EV-SAEFR).2 Total short-term morbidity, which was comprised of multiple organ failure, bleeding, ischemic complications, and limb loss, was statistically significant between the two groups with EV-SAEFR being less morbid. Independent of the two groups, periprostatic air on CT and perioperative sepsis or increased inflammatory markers (as compared to cases lacking these characteristics) were important predictors of morbidity. Looking at long-term outcomes, specifically recurrence-free, sepsis-free, combined event-free, reoperation-free, AEF-related death-free, and overall long-term survival rates, a worse, but not statistically significant, outcome for the EV-SAEFR group was demonstrated. In fact, the decreased morbidity seen early on in the EV-SAEFR group was lost by the second year of follow-up. As a result of this study, the authors concluded that EV-SAEFR may be better utilized as a transient “bridge,” suitable for the patient who is too unstable to undergo an O-SAEFR initially.

Roche-Nagle and Oreopolous reported successful endovascular management of a hemorrhaging SAEF in a 79-year-old male with alcoholic liver disease, COPD, ischemic heart disease, and a previous left-sided above-knee amputation and right-sided aorta profunda graft.3 With ventilator-dependent respiratory failure being one of the most common postoperative complications1 and this patient’s extensive comorbidities, an endovascular approach was chosen and successfully performed. The authors reported that the patient will remain on life-long antibiotics and that at outpatient follow-up he remains well.

Yang et al reported open management of a SAEF complicated with fever and leukocytosis with periprostatic air on CT.4 While axillo-bifemoral bypass is the traditional EAR approach, this patient had a history of left subclavian arteriostenosis and right subclavian arterial pseudoaneurysm previously managed with endovascular repair. As such, a right subclavian-bifemoral bypass was performed. According to the authors, the patient had an uneventful postoperative course and continues to do well.
An extensive review of the literature revealed no previously published case reports similar to the approach presented here of hemorrhage control with endograft placement immediately followed by open repair. While the patient presented with hemodynamic compromise, leukocytosis, and periprosthetic air on CT, our initial approach was that of EV-SAEFR. Given the well-documented long-term morbidity of endovascular repair, we desired a more definitive repair, and decided to open the abdomen immediately following hemorrhage control. While hemorrhage control could have been achieved with aortic balloon control, weighing the risks and benefits of ischemic time, we opted for endograft placement. We performed an aorto-bifemoral bypass with resection of the infected graft and primary closure of the jejunal injury. While ISR with antibiotic-impregnated grafts has been proven to be equivalent to if not superior to EAR, the operators in this case felt more comfortable performing a modified EAR with an antibiotic-impregnated graft and omental wrapping, a technique that has shown success in several case reports and has been well described previously. Hemorrhage control, repair of the fistula, and infection control were all approached definitively, thereby optimizing the patient’s best outcome.

CONCLUSION

Infected SAEFs present a unique challenge. Combined with hemodynamic instability, leukocytosis, sepsis, and any combination of comorbidities, SAEFs will continue to be a difficult surgical complication. While current studies continue to analyze different surgical approaches, treatment modalities, and adjuvant therapy, we should all make an effort to document our cases and make them available to the individuals conducting research. The patient presented in the case report continues to do well at 6 months follow-up with no CT evidence of complications. She will remain on PO penicillin for the rest of her life.

**Editor’s note:** The authors have completed and returned the ICMJE Form for Disclosure of Potential Conflicts of Interest. The authors report no disclosures related to the content herein.

Manuscript received April 14, 2015; provisional acceptance given June 2, 2015; manuscript accepted December 4, 2015.

Address for correspondence: Carlo J. Puzzo, DO, Nova Southeastern University, 18 Landon Ave., Hamilton, Ontario L8T4Y5, Canada. Email: cpuzzo@me.com

REFERENCES