A case of a pseudo colonic mass causing gastrointestinal bleeding in a patient with a left ventricular assist device

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ABSTRACT
There are many complications associated with the left ventricular assist devices (LVADs), including gastrointestinal bleeding (GIB). We present a case of a pseudo colonic mass visualized on colonoscopy during workup for GIB in an LVAD patient necessitating a right colectomy with final pathology negative for malignancy. A review of the literature in regards to the pathology, diagnosis, and treatment of this interesting condition is included.

Key Words: Colectomy, gastrointestinal bleeding, left ventricular assist device

INTRODUCTION
Gastrointestinal bleeding (GIB) is a well-described complication of the left ventricular assist device (LVAD) placement and has been reported to occur in 19–40% of patients with the HeartMate II device.[1] The mechanism of GIB in these patients may be secondary to alterations in vascular endothelial physiology, hemodynamic alterations, hematologic imbalances, coagulopathy, acquired von Willebrand disease, and angiodysplastic lesions.[1‑4] GIB may occur at any time after LVAD placement and can occur anywhere.[1]

CASE REPORT
RF is a 66-year-old male with a history of ischemic cardiomyopathy. The patient had a HeartMate II LVAD placed 3 years prior to presentation for medically refractory heart failure. He was on warfarin and aspirin for his LVAD with goal INR of 1.5–2.0. He presented to the emergency department with light-headedness and hematochezia for several days. He had no prior history of GIB. His physical examination and vital signs were unremarkable. His INR was 2.8, creatinine was 2.3 mg/dl, and hemoglobin was 10.4 from baseline of 12 to 13 g/dl. His last screening colonoscopy was 4 years prior and was reportedly unremarkable. He was admitted for close monitoring, serial laboratory testing, and gastroenterology consultation. He underwent esophagogastroduodenoscopy revealing a gastric ulcer with a clean base with no evidence of active bleeding. A colonoscopy revealed a likely malignant tumor in the cecum, diverticulosis, and nonbleeding colonic angiodysplastic lesions [Figure 1]. The cecal mass was biopsied; it appeared to be actively bleeding and uncontrollable endoscopically. These findings were relayed to the emergency general surgery team.

He was taken emergently to the operating room. A midline laparotomy was undertaken and he was found to have a cecal mass that was perforated into a retroperitoneal abscess. The right colon was mobilized to the hepatic flexure and the abscess cavity was debrided. A right colectomy was performed with a stapled side-to-side ileocolonic anastomosis. A drain was placed in the abscess cavity, fascia was closed, and the skin and subcutaneous tissues were packed with gauze.

Final pathology showed no evidence of malignancy. It revealed a transmural defect of 1.0 cm × 0.5 cm with...
organizing hematoma and acute on chronic inflammation. Cytomegalovirus testing was negative. There was focal re-epithelialization, thus making bleeding diverticulum a possible diagnosis.

The patient’s postoperative course was complicated by prolonged ileus necessitating total parenteral nutrition and pelvic abscess that required percutaneous drain placement. The patient additionally had bacteremia and fungemia. The patient’s postoperative complications eventually resolved, and he was discharged to home with home health.

**DISCUSSION**

GIB is an important consideration in LVAD patients. GIB is more common in LVAD patients than patients with mechanical valves on anticoagulation, showing that LVAD physiology is a major factor.[2] LVAD patients are routinely maintained on chronic anticoagulation, typically warfarin and aspirin. It is difficult to determine the risk associated with warfarin, since INR is variable in different studies and aspirin is routinely used.[1,3] Causes of GIB in a meta-analysis of 136 patients showed angiodysplasia (29%), gastritis (22%), peptic ulcer disease (13%), diverticular bleeding (6%), colonic polyps (5%), colitis (3%), and unknown or other causes (22%).[3] Location of bleeding by pooled event rates in this study was 48% for upper GIB, 22% for lower GIB, 15% for small intestinal bleeding, and 19% was unable to be localized or not evaluated.[3] To our knowledge, this is the first report of a GIB masquerading as a colonic malignancy in a patient with an LVAD.

There has been a shift from pulsatile to continuous flow pumps such as the HeartMate II.[1,4] Continuous flow pumps have shown improved durability, decreased thromboembolic events, and improved survival at the cost of increased incidence of GIB.[1,2,4] Morgan et al. found that history of previous GIB was independently associated with GIB with LVAD placement, while a meta-analysis of 1839 LVAD patients found that older age and elevated creatinine were associated with GIB whereas prior history of GIB or differences in LVAD settings were not associated with differences.[1,3]

The initial management when treating the GIB is a cessation of anticoagulants, correction of underlying coagulopathy, resuscitation, and acid suppression.[3,4] Initial diagnostic evaluation is typically with upper then lower endoscopy.[2,3] Capsule endoscopy or push enteroscopy may be used to help with localization in difficult cases.[2,4] Potential therapeutic options include endoscopic treatments, embolization, and surgical intervention, when less invasive means prove to be unsuccessful.[1] Octreotide has been tried, but there is no strong evidence to support its routine use.[3]

Depending on the severity of the GIB, lesion, and treatment, INR goal may be lowered to reduce the risk of future events or anticoagulation may even be withheld when necessary.[1,4] There is a theoretical higher risk of thromboembolic events when anticoagulation is reduced. In a study by Morgan et al., patients with an episode of GIB transitioned to lower dose warfarin (INR 1.5–2.0) and aspirin (n = 8) or with aspirin only (n = 5) therapy had no thromboembolic events.[1] Heart transplantation and LVAD removal typically results in the cessation of GIB.[3,4]

**CONCLUSION**

GIB is a relatively common complication of LVADs. Previous GIB, advanced age, continuous flow LVADs, and renal failure are the risk factors. Treatment includes reversal of anticoagulation, resuscitation, localization, endoscopy, and surgery, if needed. Future anticoagulation therapy following GIB requires assessment of risks and benefits.

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**Conflicts of interest**

There are no conflicts of interest.

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