Myocardial Ischemia, A Rare Presentation of Meckel’s Diverticulum
Trevor Nelson MS-III\textsuperscript{a}, Connor Kerndt, MS\textsuperscript{4}, Zaid Shareef, MS-III\textsuperscript{a}, Christopher Doig, D.O.\textsuperscript{a}

Introduction

Meckel’s diverticulum (MD) represents the most common congenital defect of the gastrointestinal (GI) system. MD is a true diverticulum that remains as a remnant of the omphalomesenteric duct, which connects to the yolk-sac during embryogenesis. The failed involution leaves the remnant MD which generally fails to induce symptoms or complications in a majority of those affected. Studies predict their prevalence to be about 1.2% of the general population of which only 2% will present with complication in their lifetime. A majority of patients report no symptoms and MD is found incidentally while working up another medical problem. However, it is important to note that Meckel’s diverticulum can result in dangerous complications in the adult population including bowel obstruction, intussusception, diverticulitis, perforation, and hemorrhage at a rates higher than one would expect. Of symptomatic adults with MD, bowel obstruction is the most common presentation, followed by inflammation and bleeding (Figure 1a). While GI bleeding in the elderly is more commonly related to pathology such as diverticulosis, colitis, and hemorrhoids (Figure 1b), and these diagnoses generally render many potential culprits to their etiology, MD should not be overlooked as a possible cause. This case represents an atypical presentation of MD manifesting as an NSTEMI.

Hospital Course

An 82-year-old man with a history of recent myocardial infarction presented with a two-day history of emesis and hematocrit with subsequent syncope. Other past medical history includes coronary artery disease, dyslipidemia, GERD, and bleeding duodenal ulcer. Vitalis revealed a BP 116/59 mmHg and HR 92 bpm. Laboratory testing showed a hemoglobin of 6.7 g/dl with leukocytosis and lactic acidosis (Table 1). Physical exam uncovered blood within the rectum. While in the emergency department, the patient started complaining of substernal chest pain. Electrocardiogram demonstrated ST-segment depression in the anterior leads with concurrent troponin elevation, suggestive of myocardial ischemia (Figure 2; Table 1). After treatment with nitrroglycerin and an initial blood transfusion, the patient was transferred to the ICU for further monitoring.

CT of the abdomen initially revealed no signs of acute gastrointestinal bleed and was followed by emergent esophagogastroduodenoscopy, also without identification of the bleeding source (Figure 3A). A repeat CT scan with contrast was performed the following day revealing active diverticular bleeding near the hepatic flexure and was confirmed with focal uptake on tagged-RBC Technetium 99 scan (Figure 3b, c). Arterial embolization was performed but unsuccessful in stopping the bleed (Figure 3d).

By day 3, the WBC was still elevated, while the hemoglobin, hematocrit, RBC, and platelets were still below normal (Table 2). The Meckel’s diverticulum twisted around bowel causing ischemia and necrosis of the diverticulum and surrounding small bowel. The GI bleed caused by the infarcted bowel likely induced a demand myocardial ischemia, leading to cardiac symptoms and EKG changes.

Discussion

- **What caused this presentation?**
  - The Meckel’s diverticulum twisted around bowel causing ischemia and necrosis of the diverticulum and surrounding small bowel.
  - The GI bleed caused by the infarcted bowel likely induced a demand myocardial ischemia, leading to cardiac symptoms and EKG changes.

- **What was our clinical rationale?**
  - Concerns of myocardial ischemia prompted treatment with nitrroglycerin.
  - Patient’s symptoms and laboratory values showing anemia led to several blood transfusions.
  - Initial imaging studies did not demonstrate evidence of a GI bleed. Therefore, no immediate action was taken.
  - Patient’s recurring falls in hemoglobin levels, along with failed attempts at embolizing the bleed via interventional radiology, prompted additional investigation via exploratory laparotomy.

- **What did we learn?**
  - Earlier detection of Meckel’s diverticulum can decrease risk of mortality and severe complication.
  - Do not completely rule out a bleeding Meckel’s diverticulum if it does not show up on imaging; The only way to be certain is to examine surgically.
  - This presentation could have been managed more efficiently by pursuing an exploratory laparotomy earlier after a lower number of blood transfusions.
  - GI bleeds can put stress on other organs of the body, such as the heart, leading to cardiac pathology.

Conclusion

GI bleeds can place a stress on the heart, particularly in patients with cardiac compromise. Generate a wide differential and consider atypical presentations when evaluating a GI bleed. Staying up to date on current literature promotes positive patient outcomes.

References

- Soltero, M. J., & Bill, A. H. (1976). The natural history of Meckel’s diverticulum and its relation to incidental ...) of diseased Meckel’s diverticulum found in King County, Washington, over a fifteen year period. The American Journal

**Clinical Testing**

- CT without Contrast
  - Severe diffuse pan-colonic diverticulosis without evidence of diverticulitis.
- CT with Contrast
  - Active GI bleeding most likely diverticulum from the proximal portion of the right hepatic flexure.
- Nuclear Medicine Technetium-99 Scan
  - Focus of tracer accumulation is in the region of the distal right colon near the area of arterial extravasation seen in the CT imaging.
- Angiogram Embolization
  - Successful coiling embolization of the distal right colic artery in the region of the diverticulum, reducing the area of arterial extravasation seen on prior CT. The GI bleed does not recur after the procedure, consider further intervention with embolization to prevent partial obstruction.

**Pathology Report**

- Gross specimen consisting of the infarcted Meckel’s diverticulum and portions of ileum. Mild acute inflammation is present within the mucosa. The Meckel’s diverticulum, located adjacent to the purple dusky area, measures 4.5 cm in length and 1.5-2.3 cm in width. The ileum measures 17.0 cm in length, with a circumference ranging from 4.0 to 5.0 cm.