Endoscopic removal of migrated endovascular coils from the duodenum

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Upper-GI bleeding (UGIB) is a common problem and is defined as hemorrhage originating proximal to the ligament of Treitz. The disease is divided into nonvariceal and variceal subtypes. Common causes of nonvariceal UGIB include ulcers of the esophagus, stomach, or duodenum; mucosal erosions; Mallory-Weiss tears; and malignancy.[1] Unusual causes such as Cameron lesions, Dieulafoy lesions, subepithelial lesions, gastric antral vascular ectasia, hemobilia, and vascular-enteric fistulas are less frequently encountered.[2] Although more than 90% of patients with UGIB experience hematochezia or melena, only 40% to 50% experience hematemesis.[3] Despite improvements in medical and endoscopic therapies, UGIB remains a challenge and carries significant morbidity and mortality.[4] We present a case of UGIB resulting from the rupture of a superior mesenteric artery (SMA) aneurysm treated with endovascular coiling, which was complicated by coil erosion into the small bowel necessitating endoscopic removal.

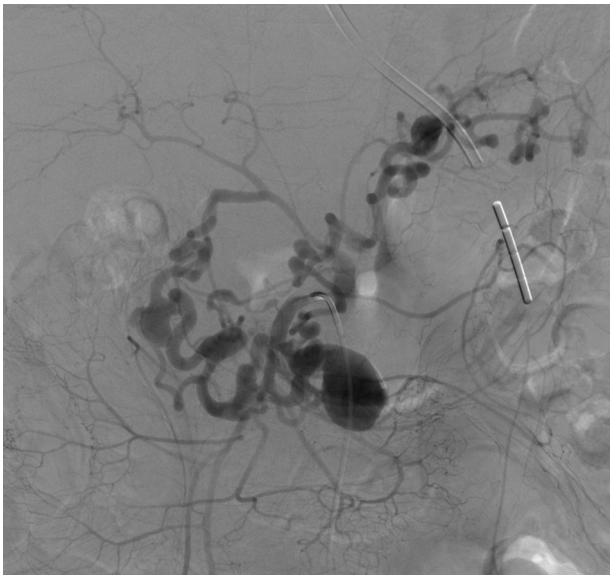

Figure 1. Angiographic image showing chronic celiac artery occlusion and multiple superior mesenteric artery aneurysms.

A 46-year-old woman presented to the hospital with hematochezia and syncope. She described associated epigastric abdominal pain but not nausea or vomiting. In

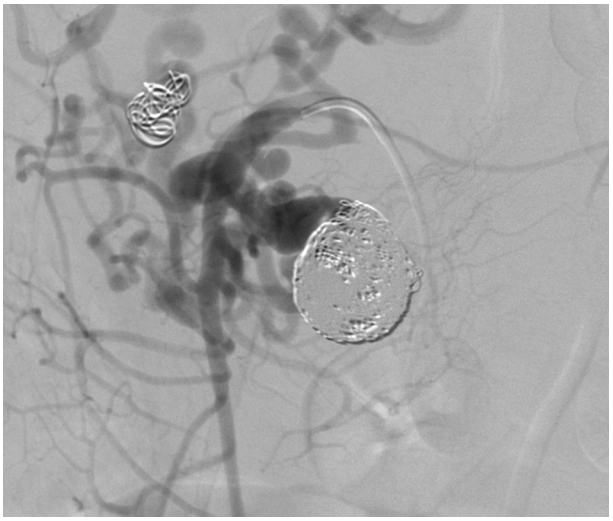

Figure 2. Angiographic image showing endovascular coil embolization of a proximal branch superior mesenteric artery aneurysm.

Figure 3. Angiographic image showing additional coiling of anterior and posterior inferior pancreaticoduodenal artery aneurysms.

Written transcript of the video audio is available online at www.VideoGIE.org.

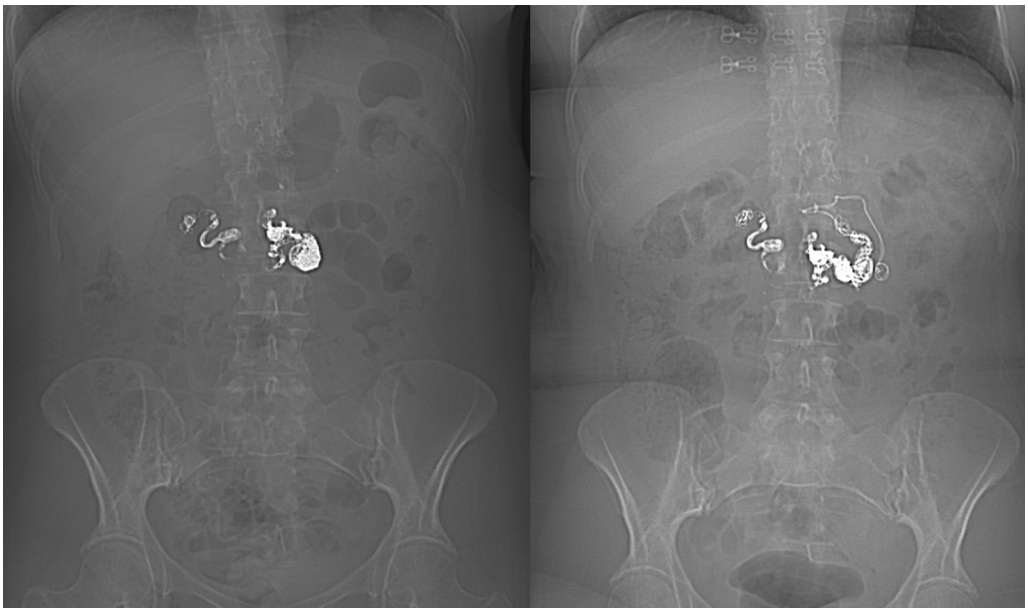

Figure 4. CT scout image showing erosion of the superior mesenteric artery aneurysm coil into the duodenum.

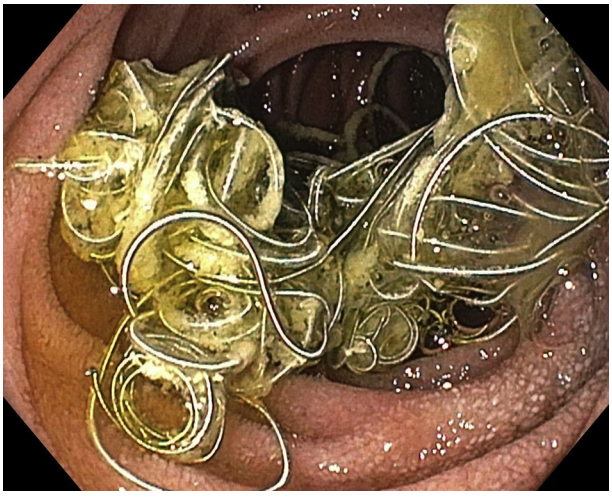

Figure 5. Endoscopic view showing endovascular coil wire in the duodenum.

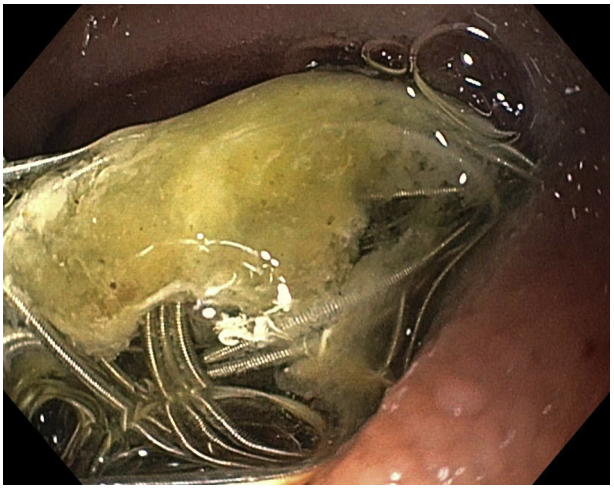

Figure 6. Endoscopic view showing fistula formation between the duodenum and the superior mesenteric artery.

the emergency department, her initial blood pressure was 88/51 mm Hg, and she was tachycardic to 128 beats per minute. Maroon-colored stool was noted on rectal examination. Her hemoglobin was 7.0 g/dL, and her blood urea nitrogen level was elevated to 23 mg/dL despite a normal serum creatinine. Volume resuscitation with 3 L normal saline solution and 2 units of packed red blood cells was given. After administration of an intravenous proton pump inhibitor, the patient was transferred to the intensive care unit for further treatment. EGD was performed at the bedside but did not elucidate the cause of her symptoms.

A colonoscopy was planned; however, while receiving the bowel purgative, she experienced worsening hematochezia and hypotension requiring vasopressors. She was deemed too hemodynamically unstable to undergo a CT angiogram. She was intubated for airway protection and was given volume resuscitation. An emergent mesenteric angiogram revealed chronic occlusion of the celiac artery (CA) with collateral circulation arising from the inferior pancreaticoduodenal artery and multiple aneurysms of the superior mesenteric and splenic arteries (Fig. 1).

Successful endovascular coil embolization of the largest aneurysm of a proximal branch of the SMA supplying the 4th portion of the duodenum was performed (Fig. 2),

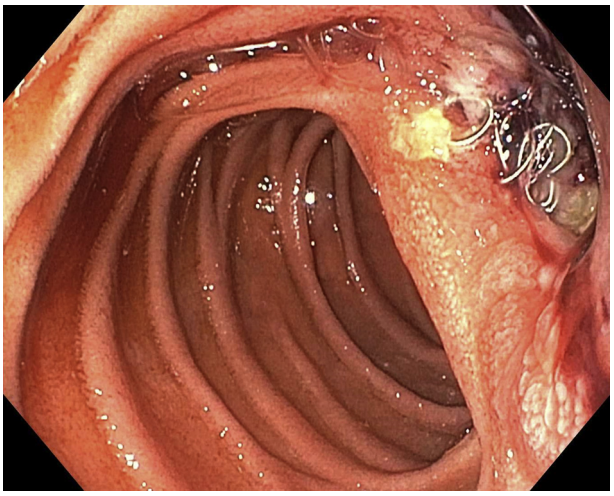

Figure 7. Endoscopic view showing duodenal ulcer.

and a total of 34 coils were deployed. The inflow and outflow tracts were not treated because of concern for limiting flow to the CA. The patient had no recurrent symptoms.

The chronic CA occlusion was thought to be secondary to median arcuate ligament syndrome, and she underwent release of the median arcuate ligament and creation of a CA bypass graft from the aorta to the hepatic artery. Mesenteric angiography with additional coiling of multiple aneurysms of the anterior and posterior inferior pancreaticoduodenal arteries was performed after the aortohepatic bypass (Fig. 3). The inflow and outflow tracts of the previously treated SMA aneurysm and an arc of Buhler aneurysm were successfully embolized as well. The patient's propensity to the formation of multiple aneurysms was attributed to segmental arterial mediolysis, a rare vascular disorder of unknown cause characterized by disruption of the arterial medial layer. This condition can result in arterial dissection, aneurysmal formation, ischemia, and spontaneous hemorrhage.

Two months after these interventions, the patient began to experience left-sided abdominal pain. A CT angiogram was obtained for further evaluation and showed erosion of the SMA coil into the distal part of the duodenum, as depicted on the scout images (Fig. 4). This was seen as a possible explanation for her abdominal pain, and the decision was made to proceed with an EGD and coil removal, with the interventional radiology service on standby (Video 1, available online at www.VideoGIE.org). The endoscope (GIF-H190; Olympus America, Center Valley, Pa) was advanced into the distal part of the duodenum, where a large amount of coil wire was encountered (Fig. 5). The point of fistula formation between the duodenum and SMA was identified, and this fistulous tract likely enabled the wire to erode into the duodenum (Fig. 6).

The coil wire was tangled in the duodenal lumen, so instead of first using endoscopic scissors (FS-3L-1, Olympus America) to cut and remove the detached wire from the intestinal wall, we grasped it with rat-toothed forceps (FG-42L-1, Olympus America) and extracted it through the mouth in piecemeal fashion. An ulcer was seen along the anterior duodenal wall, but no bleeding or other adverse events occurred (Fig. 7). Residual wire within the ulcer was left because of concern for future bleeding from the previously treated aneurysm. Additional coil wire extending into the lumen was then trimmed with endoscopic scissors, and the procedure was completed.

The patient was given a 7-day course of antibiotics and recovered uneventfully. She was seen in the clinic 3 months later and continued to do well. Interval imaging to assess the stability of the splenic artery aneurysm is planned.

DISCLOSURE

Dr Shami is a consultant for C2 Therapeutics. All other authors disclosed no financial relationships relevant to this publication.

Abbreviations: CA, celiac artery; SMA, superior mesenteric artery; UGIB, upper-GI bleeding.

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