

AMSER Case of the Month:

61-year-old male presents with epigastric abdominal pain of 3 weeks duration

Zachary Gish, OMS IV, Lake Erie College of Osteopathic Medicine

Danielle Miller, DO PGY-3, Allegheny General Hospital

Kyle Cothron, MD Interventional Radiology, Allegheny General Hospital

Patient Presentation

- **HPI:** 61-year-old male presents with gnawing epigastric pain beginning 3 weeks ago.
- **PMHx:** NASH Cirrhosis s/p DIPS with multiple revisions, esophageal varices, Mallory-Weiss tear, gastric varices s/p endovascular coiling in 2017, gastric ulcer, hepatic encephalopathy, Type II DM, hyperlipidemia
- **Family Hx:** Non-contributory
- **Social Hx:** 20 pack year smoker who quit 20 years ago, current smokeless tobacco user, no alcohol or illicit drug use

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

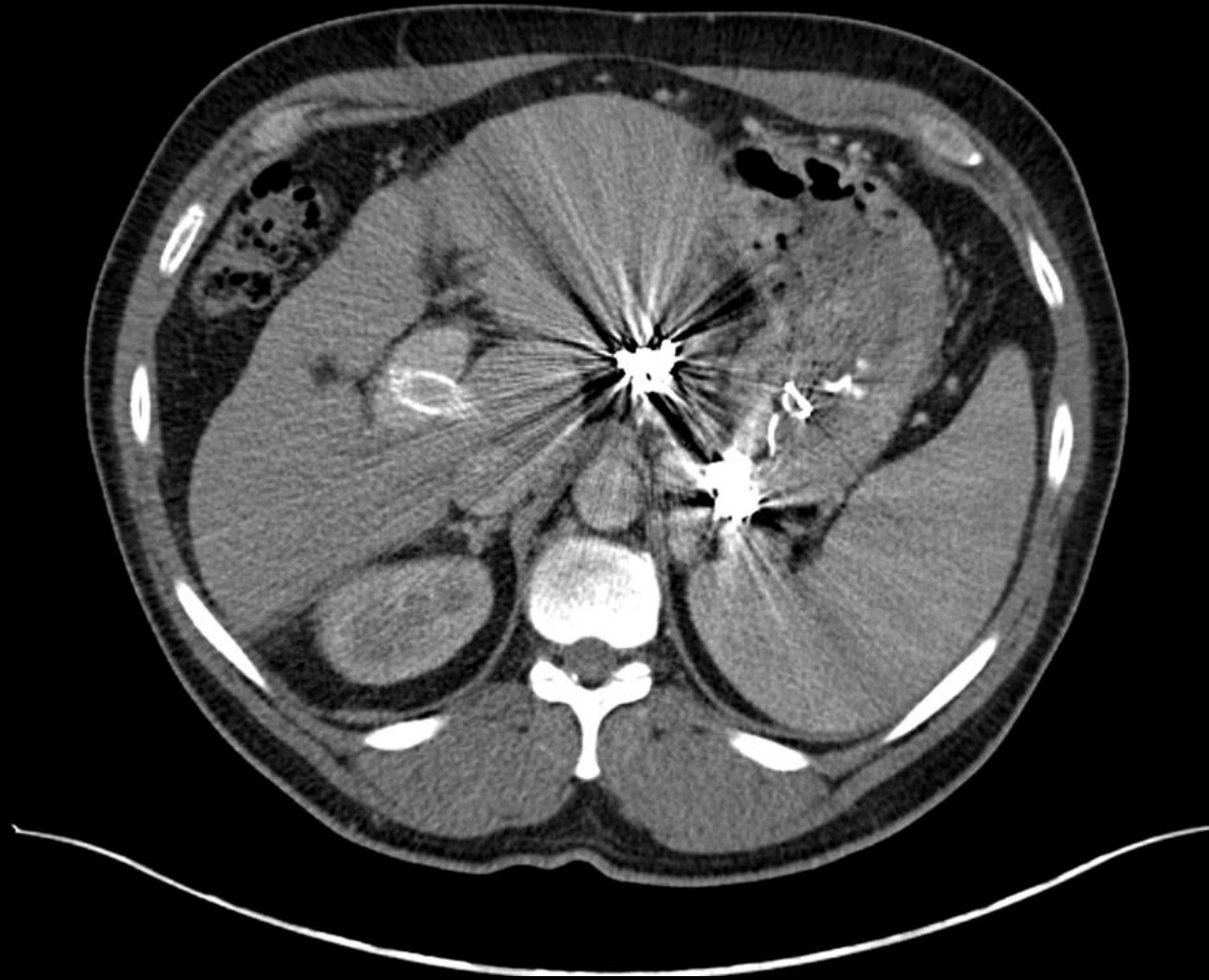
Variant 4: Acute nonlocalized abdominal pain. Not otherwise specified. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	⊕⊕⊕
CT abdomen and pelvis without IV contrast	Usually Appropriate	⊕⊕⊕
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	○
US abdomen	May Be Appropriate	○
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	⊕⊕⊕⊕
Radiography abdomen	May Be Appropriate	⊕⊕
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊕⊕⊕⊕
WBC scan abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕⊕
Nuclear medicine scan gallbladder	Usually Not Appropriate	⊕⊕
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	⊕⊕⊕
Fluoroscopy contrast enema	Usually Not Appropriate	⊕⊕⊕

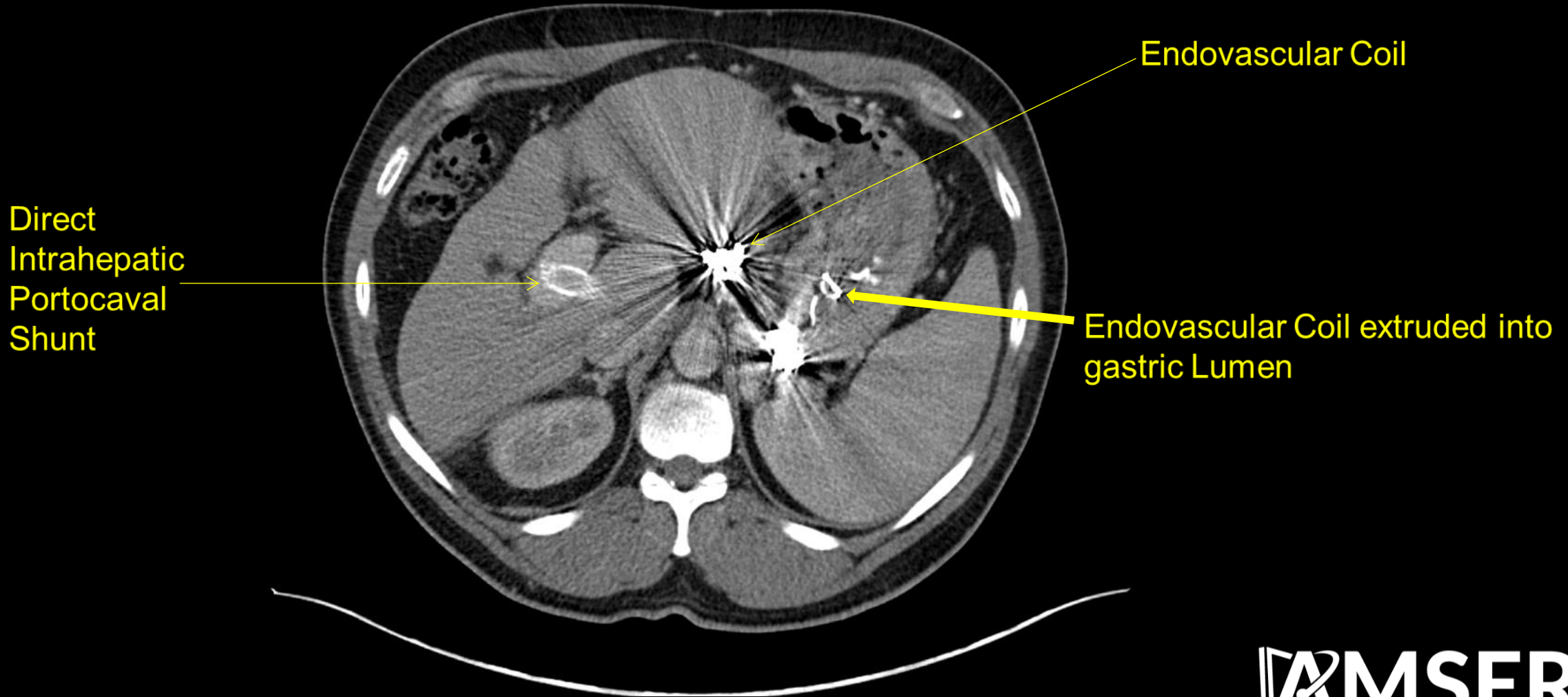


This imaging modality was ordered by the ER physician

Findings-CT with IV Contrast (Inpatient day 1)



Findings-CT with IV Contrast (Inpatient day 1)



Findings-Upper GI Endoscopy (Inpatient day 2)



1 : Foreign body

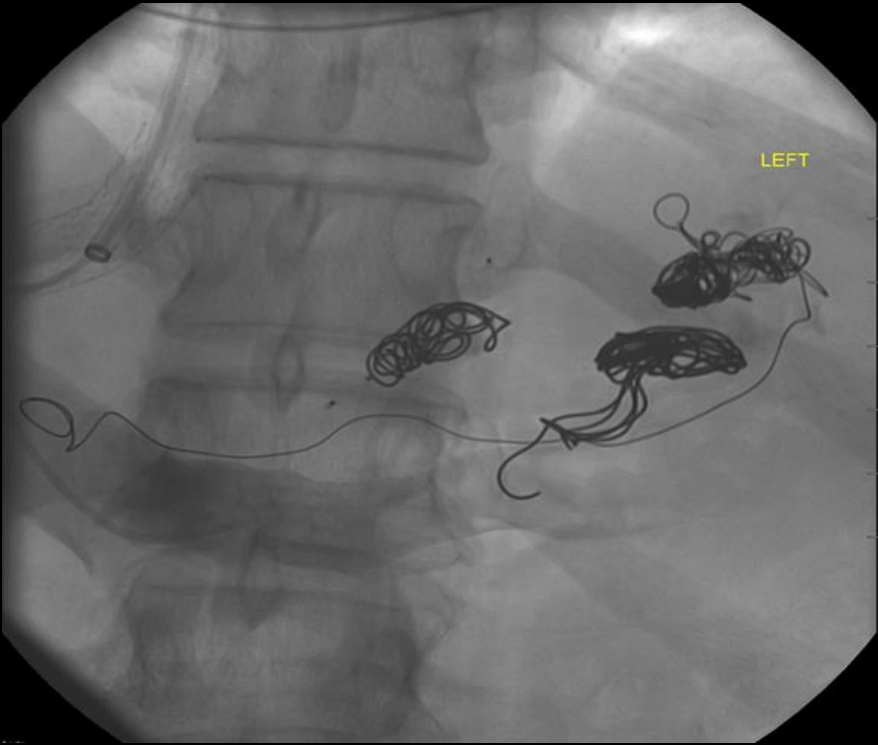


5 : Gastric Antral Vascular Ectasia (GAVE)



8 : *Portal hypertensive gastropathy

Findings-IR Hepatic Venogram (Inpatient day 3)



Findings-IR Hepatic Venogram: Comparison with Initial Embolization



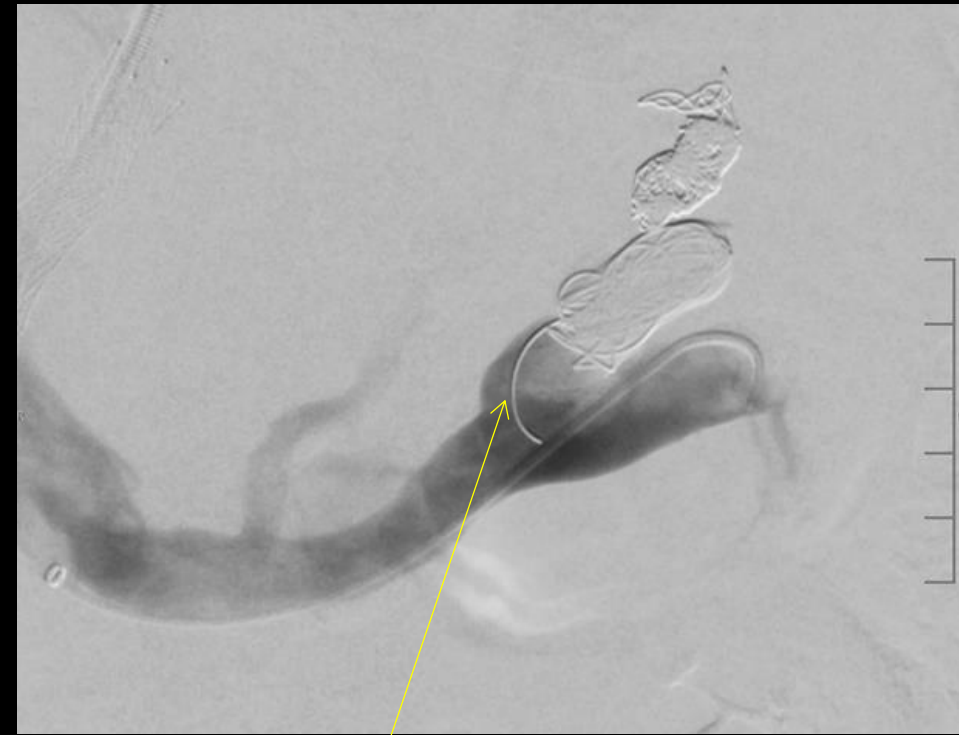
Findings-IR Hepatic Venogram (Inpatient day 3)

Access through DIPS



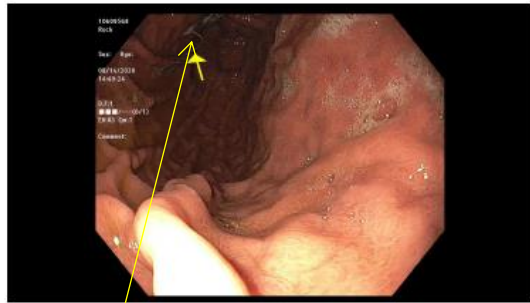
Endovascular coil now migrated from gastric cardia into proximal duodenum

Catheter access into splenic vein with contrast demonstrating occlusion of previously coiled gastric varix



Comparison Venogram from coil placement (2017) illustrating successful gastric varix occlusion

Findings-Upper GI Endoscopy (Inpatient day 4)



3 Gastric Fundus



5



6 Gastric Cardia



Migrated endovascular coil

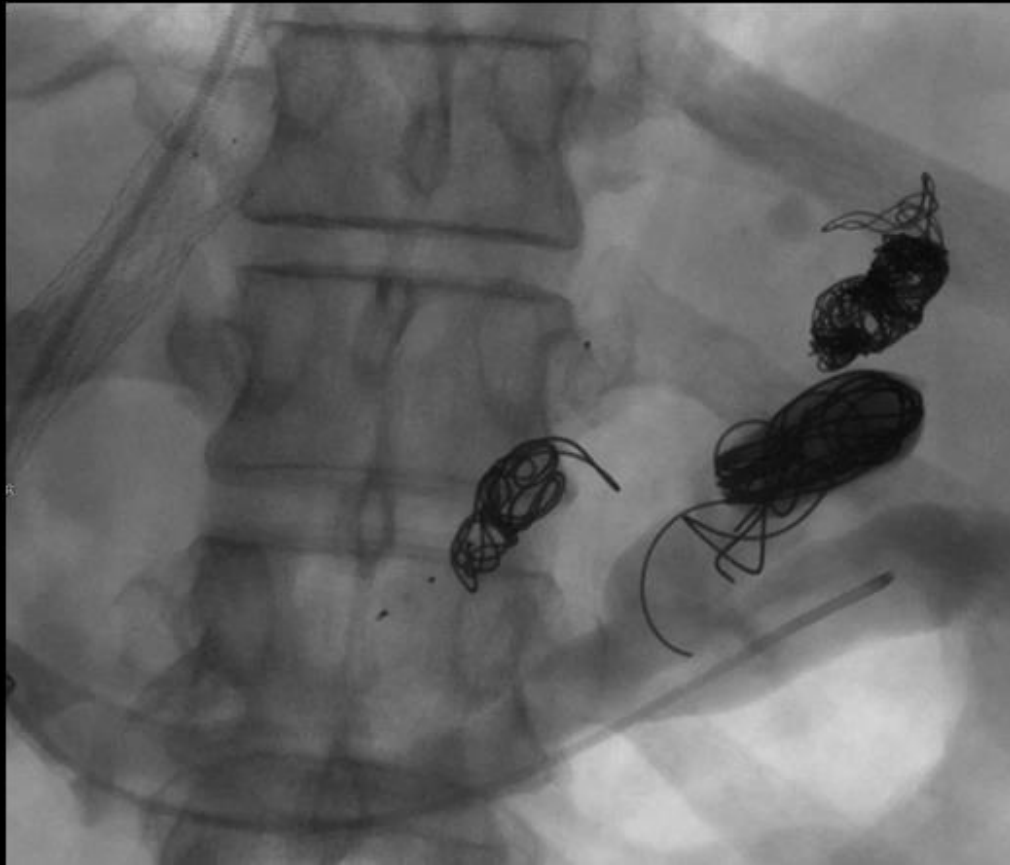
Following coil removal

Total amount of coil recovered

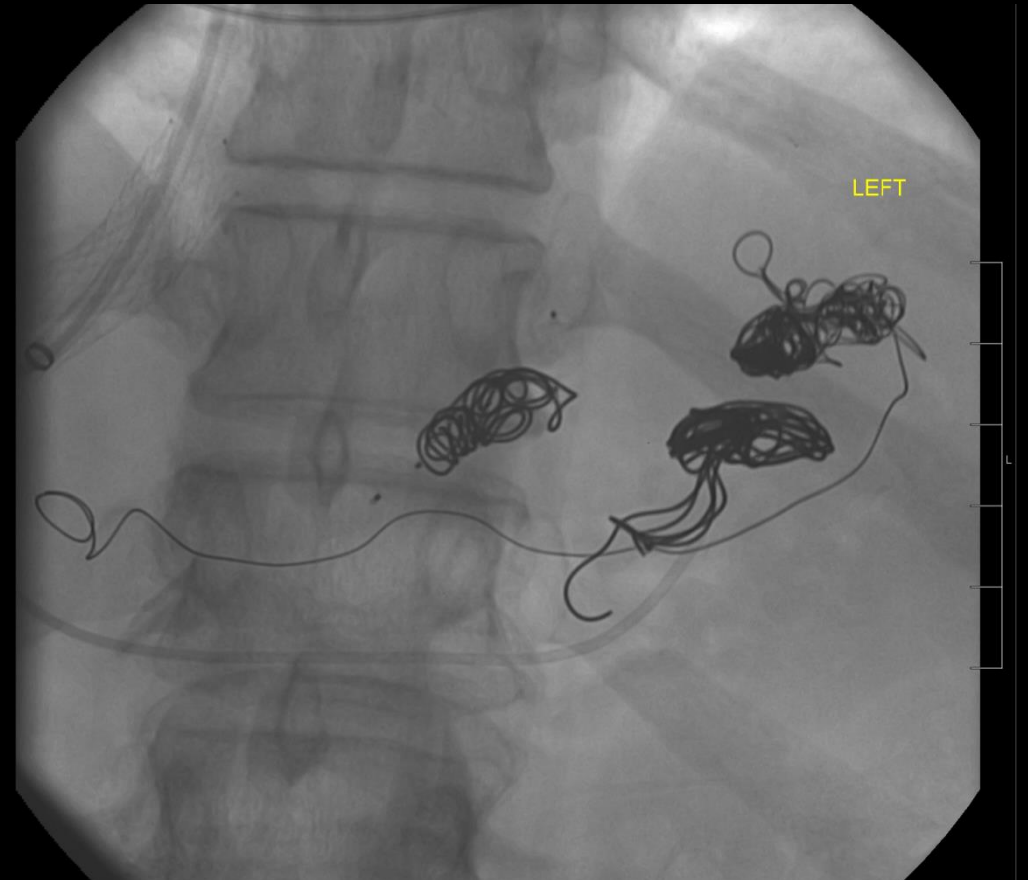
Final Dx:

Erosion and Migration of Endovascular Embolization
Coils from Gastric Varix into Gastric Lumen

Placement vs. Presentation



Placement 2017



Presentation 2020

Case Discussion

- This is an extremely rare complication of endovascular coil placement mentioned in as few as 11 case reports as of 2020. With most resulting from arterial aneurysmal or pseudoaneurysmal repair. ²
- The occurrence of a coil migrating and eroding through a gastric varix is even more uncommon with a literature search resulting in three prior cases. ^{3,4,5}
- There is little data in the current literature to guide management in such cases and case report management approaches vary.
 - Some coils pass spontaneously ^{2,6}
 - Others have been removed endoscopically under fluoroscopic guidance ^{7,8}
 - One instance required partial gastrectomy with distal pancreatectomy and splenectomy ⁹

Varices

- Varices are a common manifestation of portal hypertension caused by cirrhosis. They are typically seen within the esophagus or gastric wall. These are fragile collaterals with a propensity for hemorrhage.
- Management strategies include:
 - Pharmacologic therapy (nonselective beta blockers, vasopressin, somatostatin and analogs)
 - Banding and ligation of varices can be performed either prior to or during active bleeding
 - Transjugular intrahepatic portosystemic shunts (TIPS), or Direct intrahepatic portocaval shunts (DIPS)
 - Endovascular varix embolization

TIPS Procedure

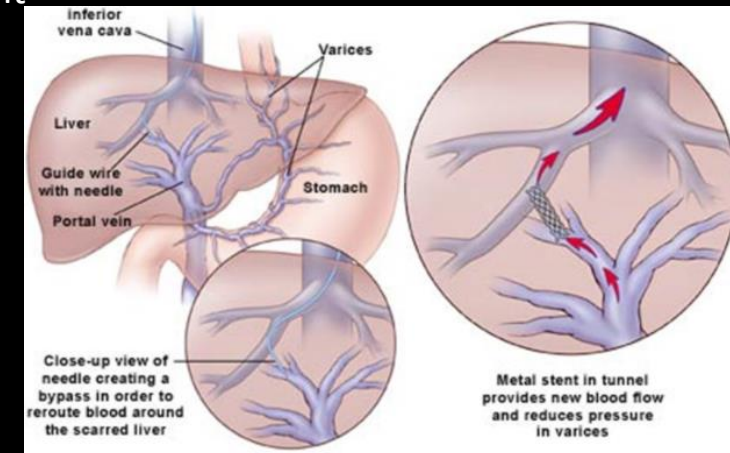
- Can be performed prophylactically to reduce elevated portal pressures, as well as urgently in an effort to stop variceal hemorrhage resistant to less invasive measures (pharmacotherapy, balloon tamponade, endoscopic banding/ligation).
- Additionally, can be therapeutically performed to reduce refractory ascites
- Procedure involves:
 - Placement of a needle catheter via a transjugular route into the hepatic vein
 - The needle is then passed through the hepatic vein into the portal vein through the liver parenchyma
 - This tract is then expanded through balloon dilation and stabilized with stent placement
- Advantages: Does not require general anesthesia or major surgery for placement

Absolute Contraindications:

- Congestive heart failure
- Severe pulmonary hypertension
- Sepsis
- Unrelieved biliary obstruction
- Severe tricuspid regurgitation
- Rapidly progressive liver failure
- Presence of multiple hepatic cysts

Relative Contraindications:

- Portal or hepatic vein thrombosis
- Extensive hepatic malignancy
- Moderate pulmonary hypertension
- Severe coagulopathy or thrombocytopenia
- Hepatic Encephalopathy



<https://www.dravinastank.in/liver-pancreas/lp-portal-hypertension.php>

References:

1. ACR Appropriateness Criteria: Acute nonlocalized abdominal pain. American College of Radiology. <https://acsearch.acr.org/docs/69467/Narrative/>. Updated 2018.
2. Matsubara Y, Lim LA, Hijikata Y, Hirata Y, Yotsuyanagi H. Embolization coil migration in the stomach and spontaneous excretion: a case report and review of the literature. *Radiol Case Rep*. 2020;15(7):1018-1022. Published 2020 May 26. doi:10.1016/j.radcr.2020.04.053
3. Hussain S, Ghaoui R. Porto-gastric fistula from penetration of coil from gastric varix after TIPS procedure for bleeding gastric varices. *J Interv Gastroenterol*. 2011;1(1):33. doi:10.4161/jig.1.1.14599
4. Kupkova B, Fejfar T, Krajina A, Hulek P, Tacheci L, Bures J. Porto-gastric fistula due to penetration of metallic coil into the stomach: a rare complication of endovascular treatment of gastric varices. A case report. *Folia Gastroenterol Hepatol*. 2006;4:107–111.
5. Levi Sandri GB, Lai Q, Mennini G, Trentino P, Berloco PB, Rossi M. Massive bleeding from a gastric varix coil migration in a liver transplant patient. *J Gastrointest Liver Dis*. 2013;22(3):249.
6. Shah NA, Akingboye A, Haldipur N, Mackinlay JY, Jacob G. Embolization coils migrating and being passed per rectum after embolization of a splenic artery pseudoaneurysm, 'the migrating coil': a case report. *Cardiovasc Intervent Radiol* 2007;30:1259–62.
7. Mahajan A, Kumer SC, Wang AY. Electronic images of the month. Duodenal ulceration following variceal embolization with coils and vascular plugs. *Clin Gastroenterol Hepatol* 2010;8:e63–64.
8. Han YM, Lee JY, Choi IJ, Kim CG, Cho S-J, Lee JH, et al. . Endoscopic removal of a migrated coil after embolization of a splenic pseudoaneurysm: a case report. *Clin Endosc* 2014;47:183–7.
9. Takahashi T, Shimada K, Kobayashi N, Kakita A. Migration of steel-wire coils into the stomach after transcatheter arterial embolization for a bleeding splenic artery pseudoaneurysm: report of a case. *Surg Today* 2001;31:458–62.
10. Dariushnia SR, Haskal ZJ, Midia M, et al. Quality Improvement Guidelines for Transjugular Intrahepatic Portosystemic Shunts. *J Vasc In* 7. doi:10.1016/j.jvir.2015.09.018