AMSER Case of the Month: June 2020

8-year-old with vomiting and abdominal pain

Gunnye Pak – MS3
Elson S. Floyd College of Medicine

Dr. Julie Kaczmark, MD
Inland Imaging

Patient Presentation

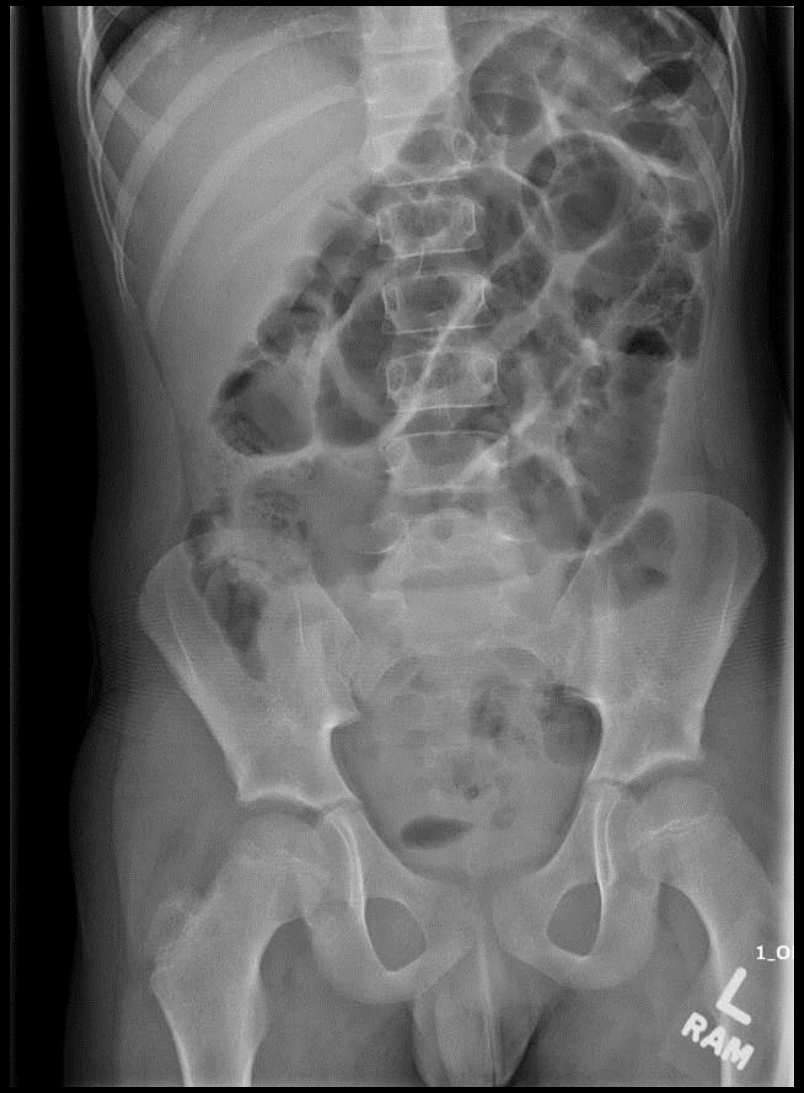
- HPI: 8 yo male presented to the ED with complaint of worsening abdominal pain and vomiting for 5 days. The patient was evaluated in the ED the day before for similar symptoms, and discharged with Zofran for symptomatic control after the patient started to feel better. However, the symptoms returned and the patient has since experienced worsening abdominal pain and repeated episodes of dark green vomiting without relief. He is negative for fevers, hematemesis, diarrhea, and hematochezia. Last bowel movement is reported to have been about 5 days ago.
- The family member added that the patient has had recurrent episodes of abdominal pain and vomiting for several years but the symptoms always resolved.
- Immunizations are up to date.
- Physical Exam:
  - Afebrile and hemodynamically stable. Blood pressure elevated at 138/76
  - General: Patient is alert but appears uncomfortable
  - Abdomen: Soft, mild diffuse abdominal tenderness, non-distended. No guarding or rebound.

Pertinent Labs

- WBC 17.82
- CRP elevated at 2.8

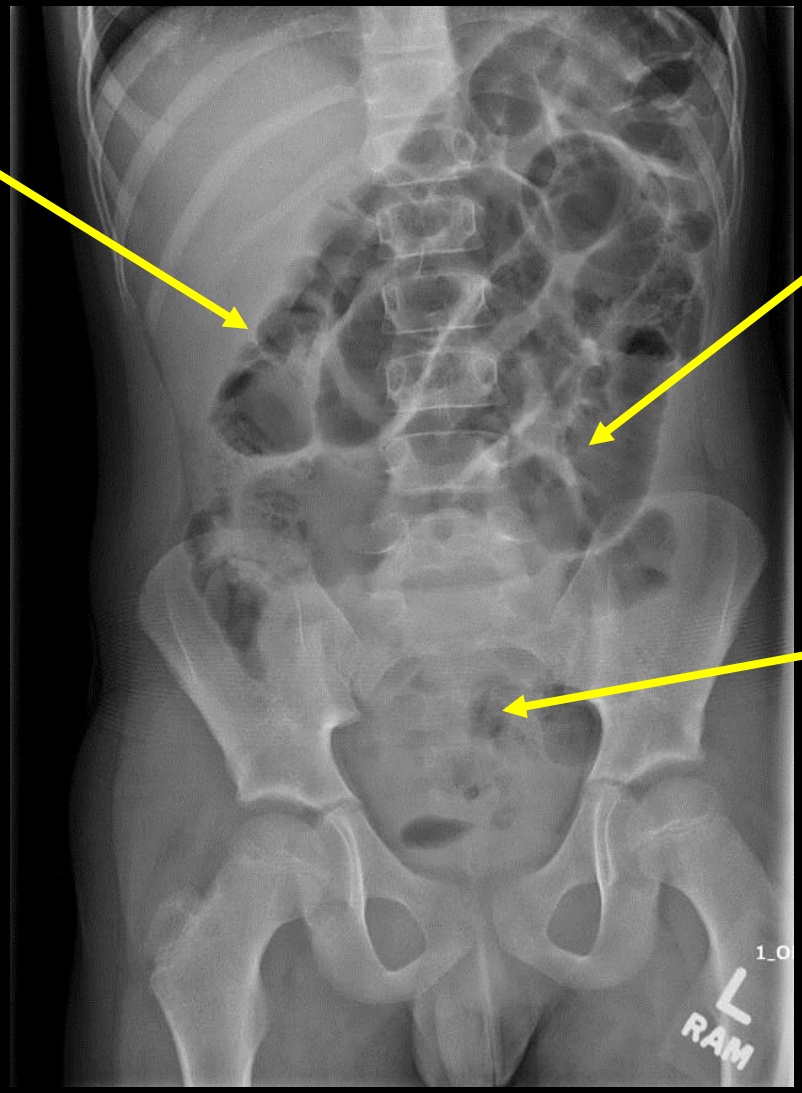
What Imaging Should We Order?

Abdominal radiograph (unlabeled)



Abdominal Radiograph (labeled)

Gas within normal caliber ascending and transverse colon



Multiple dilated loops of small bowel

Paucity of bowel content and gas in the descending and sigmoid colon.

Select the applicable ACR Appropriateness Criteria

Variant 1: **Suspected small-bowel obstruction. Acute presentation. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
CT abdomen and pelvis without IV contrast	May Be Appropriate	☢☢☢
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	O
Radiography abdomen and pelvis	May Be Appropriate (Disagreement)	☢☢☢
Fluoroscopy small bowel follow-through	May Be Appropriate	☢☢☢
MRI abdomen and pelvis without IV contrast	May Be Appropriate	O
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
CT enteroclysis	Usually Not Appropriate	☢☢☢☢
CT enterography	Usually Not Appropriate	☢☢☢☢
MR enterography	Usually Not Appropriate	O
US abdomen and pelvis	Usually Not Appropriate	O
Fluoroscopy small bowel enteroclysis	Usually Not Appropriate	☢☢☢
MR enteroclysis	Usually Not Appropriate	O

This imaging modality was ordered by the ER physician after an abdominal KUB

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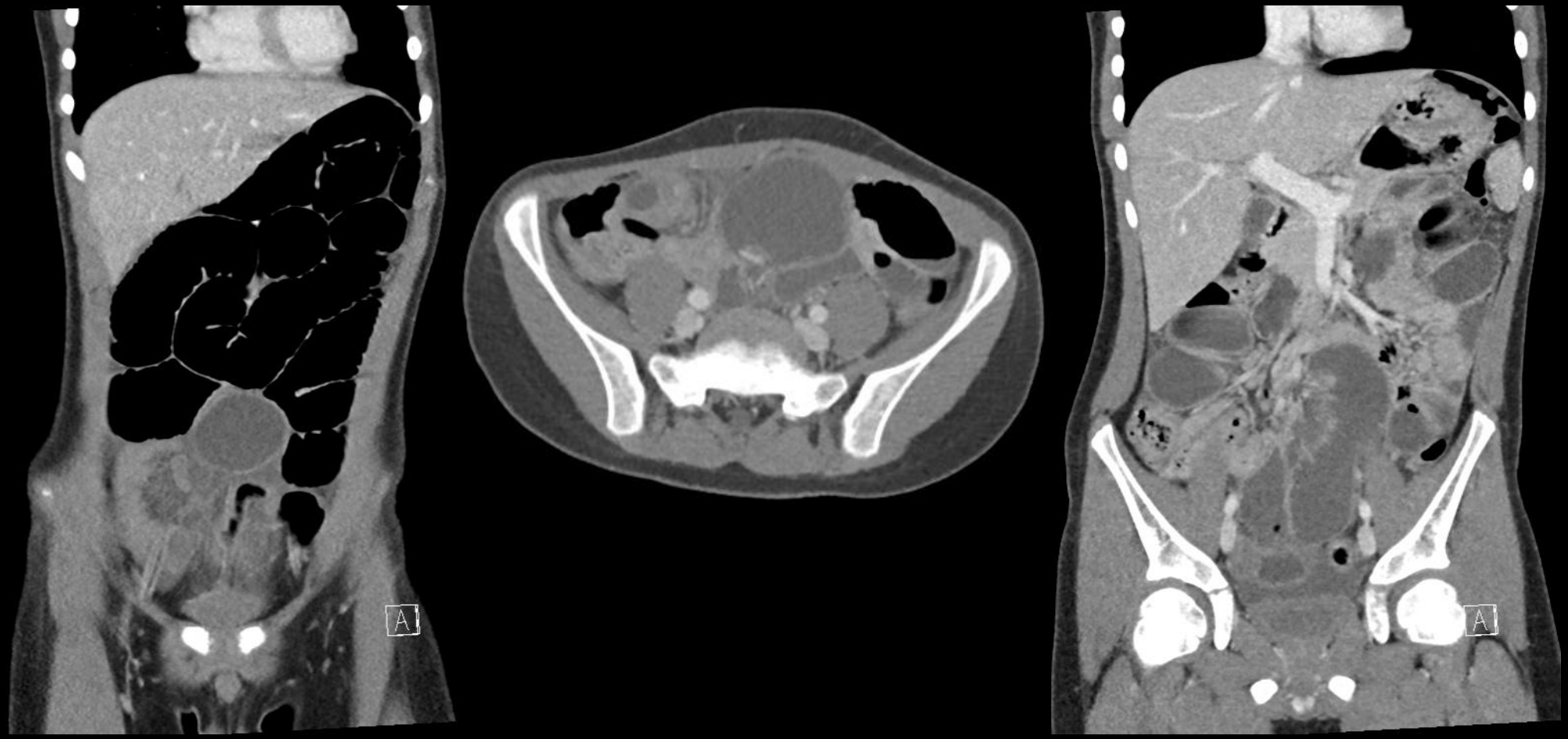
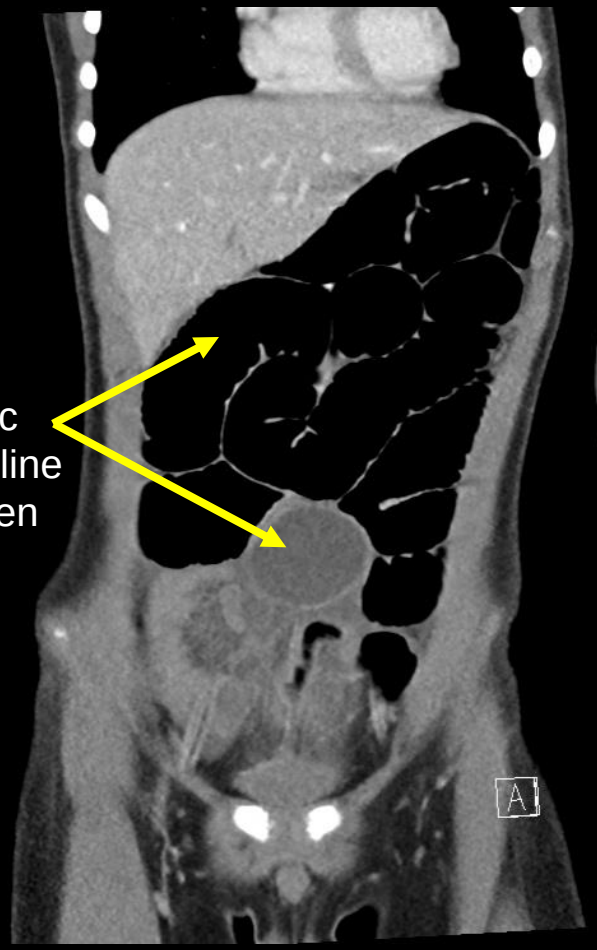
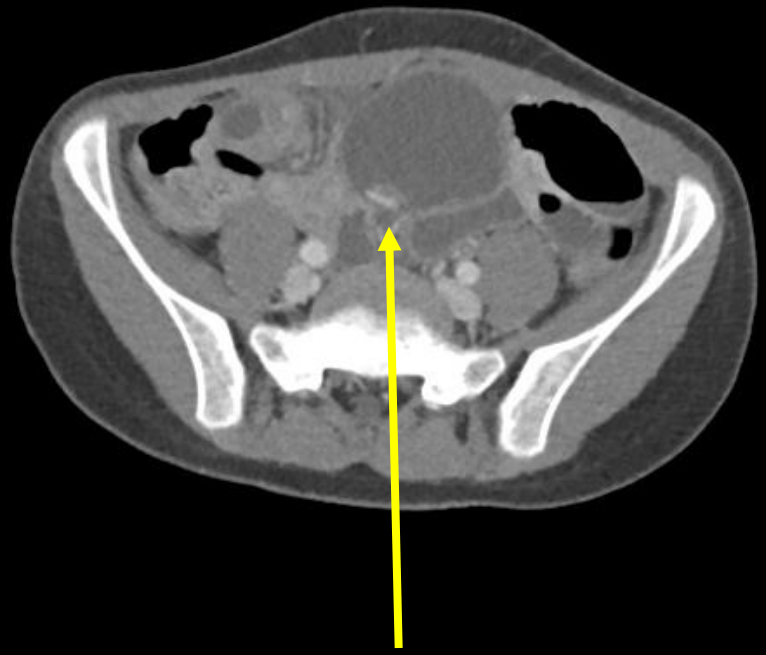
CT with IV Contrast (unlabeled)



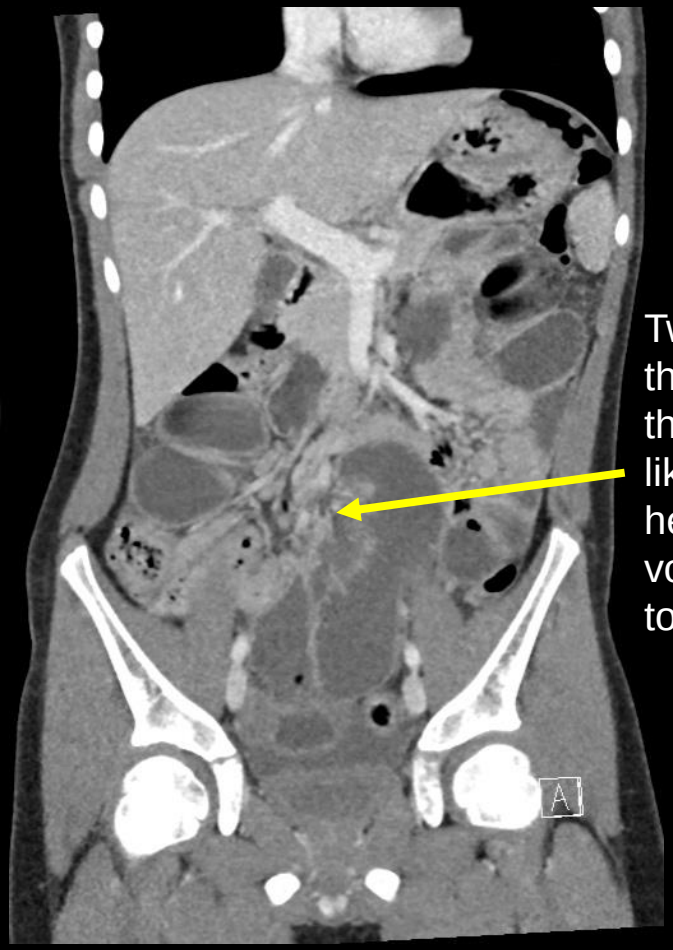
CT with IV Contrast (labeled)

Multiple dilated loops of small bowel with cystic mass in the midline of lower abdomen





Cystic mass with dependent high attenuation. May represent a small calcification.



Twisting of the bowel in the RLQ, likely internal hernia or volvulus due to cystic mass

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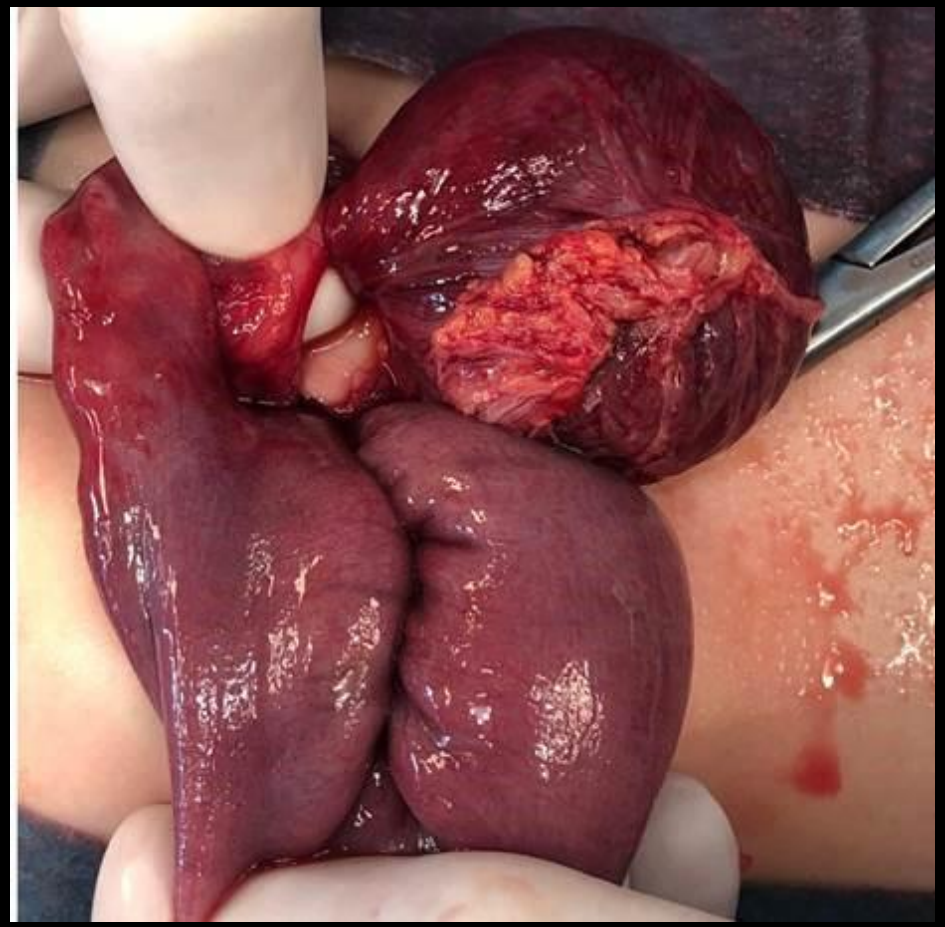
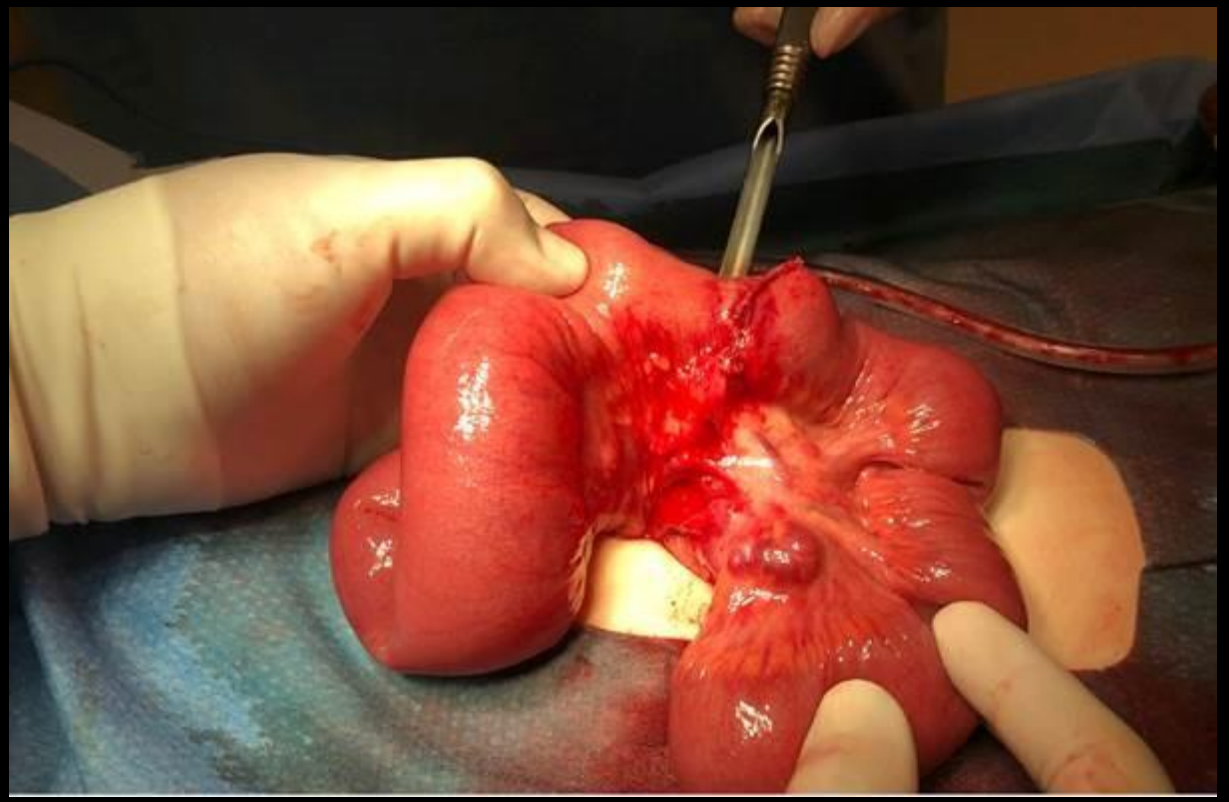
Final Dx:

Volvulized Ischemic Meckel's Diverticulum

Operative Photos





Intraoperative pictures during laparotomy, detorsion of volvulized bowel, and Meckel's diverticulectomy

Case Discussion

- Meckel's diverticulum is a remnant of the omphalomesenteric (Vitelline) duct
- Most common congenital abnormality of the GI tract
- Classically presents with painless rectal bleeding
- Rule of 2's – **2** inches long, **2** feet from the ileocecal valve, **2**% of the population, commonly presents in the first **2** years of life
- Complications include intestinal perforation, ulceration, obstruction, diverticulitis (can mimic appendicitis), and intussusception

Diagnosis

- Radiographs have limited value but can be useful in diagnosing obstruction or perforation
- A Meckel scintigraphy scan in the setting of painless gastrointestinal bleeding is diagnostic with a sensitivity of 80-90% and specificity of 95% in children. The test is less reliable in adults.
  - Technetium-99m pertechnetate is taken up ectopic gastric tissue that may be present in the Meckel's diverticulum, leading to gastric acid production and downstream ulceration/hemorrhage.
- In this case, the radiograph revealed signs of bowel obstruction which prompted a CT abdomen and pelvis with contrast

Treatment

- Surgical excision of the diverticulum
- Indications for surgery include
  - Hemorrhage
  - Diverticulitis
  - Intestinal perforation
  - **Obstruction**
  - Intussusception

References:

1. ACR Appropriateness Criteria https://acsearch.acr.org/list
2. Sagar, J., Kumar, V., & Shah, D. K. (2006). Meckel's diverticulum: a systematic review. *Journal of the Royal Society of Medicine*, *99*(10), 501–505. https://doi.org/10.1258/jrsm.99.10.501
3. Kotha, V. K., Khandelwal, A., Saboo, S. S., Shanbhogue, A. K., Virmani, V., Marginean, E. C., & Menias, C. O. (2014). Radiologist's perspective for the Meckel's diverticulum and its complications. *The British journal of radiology*, *87*(1037), 20130743. https://doi.org/10.1259/bjr.20130743

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