Bowel obstruction

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Disclosures

- Nothing to disclose

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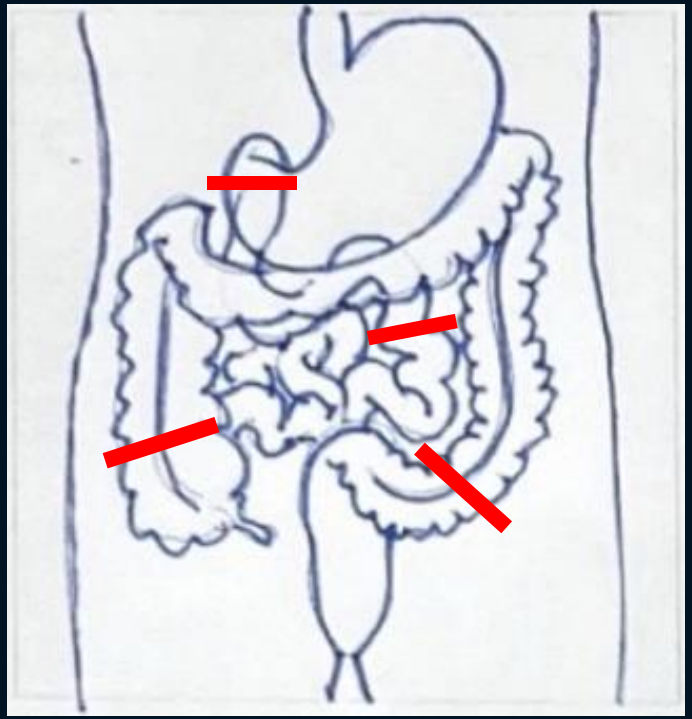
Bowel obstruction - locations

- High vs low
  - ≅ 80% small bowel, 20% large bowel
- Partial vs complete
- Simple vs strangulated



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Bowel obstruction – symptoms and signs

- Crampy abdominal pain (on palpation)
- Nausea
- Vomiting – relief of symptoms
- Feeling gassy
- Constipation
- Metallic bowel sounds

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Bowel obstruction - reasons

- Adhesions
- Hernia
- Volvulus
- Intussusception
- Scarring
- Inflammatory bowel disease
- Diverticulitis
- Tumor
- Foreign objects
- Meckel’s diverticulum

- Developed countries → >75% adhesions
- Developing countries → >80% hernia

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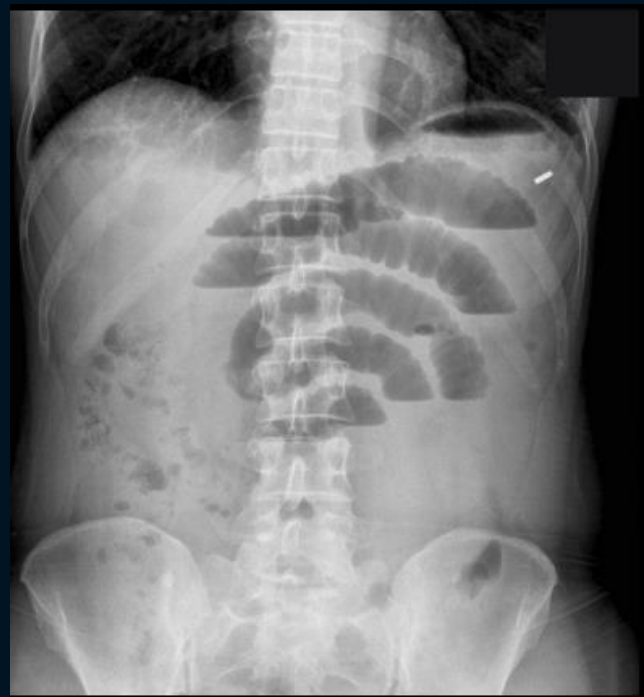
Bowel obstruction - imaging

- Plain abdominal film
  - Air/fluid levels
  - Dilatation
  - String-of-beads sign
  - Airless abdomen
- CT abdomen
  - Without iv-contrast agent – bowel obstruction
  - With iv-contrast agent – ischemia
- Small bowel follow through
  - If immediate surgery is not indicated



45 year old Male Edit

Service: **Not Selected** Edit

Indication(s):
SBO high-grade suspected

Appropriateness rankings for a 45 year old Male

Appropriateness	Service	Cost	RRI
9	CT, abdomen-pelvis, w iv contrast	€€€	☢☢☢☢☢
7	CT, abdomen-pelvis, wo iv contrast	€€	☢☢☢☢☢
6	MR, abdomen-pelvis, wo/w iv contrast	€€€€	
5	XRAY, abdomen-pelvis	€€	☢☢☢
4	CT, abdomen-pelvis, wo/w iv contrast	€€€	☢☢☢☢☢
4	FLUOR, SBFT	€€€	☢☢☢
4	MR, abdomen-pelvis, wo iv contrast	€€€€	
3	CT, enteroclysis, abdomen-pelvis, w iv contrast	€€€	☢☢☢☢☢
3	CT, enterography, abdomen-pelvis, w iv contrast	€€€	☢☢☢☢☢
3	FLUOR, enteroclysis	€€€€	☢☢☢
3	MR, enteroclysis, abdomen-pelvis, wo/w iv contrast	€€€€	
3	MR, enterography, abdomen-pelvis, wo/w iv contrast	€€€€	
2	US, abdomen-pelvis	€€€	

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JAMA Surg. 2023 Jul 1;158(7):e231112. doi: 10.1001/jamasurg.2023.1112. Epub 2023 Jul 12.

Diagnostic Accuracy of Unenhanced Computed Tomography for Evaluation of Acute Abdominal Pain in the Emergency Department

Hiram Shaish [1], Justin Ream [2], Chenchan Huang [3], Jonathan Troost [4], Sonia Gaur [5], Ryan Chung [6], Sooah Kim [3], Hanisha Patel [1], Jeffrey H Newhouse [1], Shokoufeh Khalatbari [4], Matthew S Davenport [7 8]

Conclusion: Unenhanced CT was approximately 30% less accurate than contrast-enhanced CT for evaluating abdominal pain in the ED. This should be balanced with the risk of administering contrast material to patients with risk factors for kidney injury or hypersensitivity reaction.

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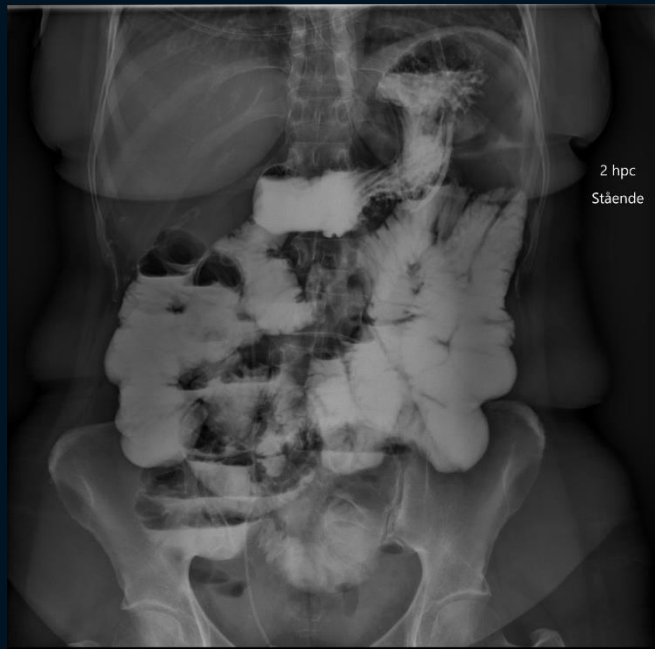
Small bowel follow through

- 300 ml water soluble contrast agent
- Drink/in nasogastric tube
- Plain film after 2h and at intervals depending on progress and signs



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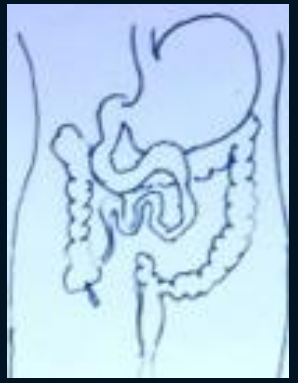
Bowel obstruction - high



- 69-year-old female
- Abdominal pain
- Free gas?

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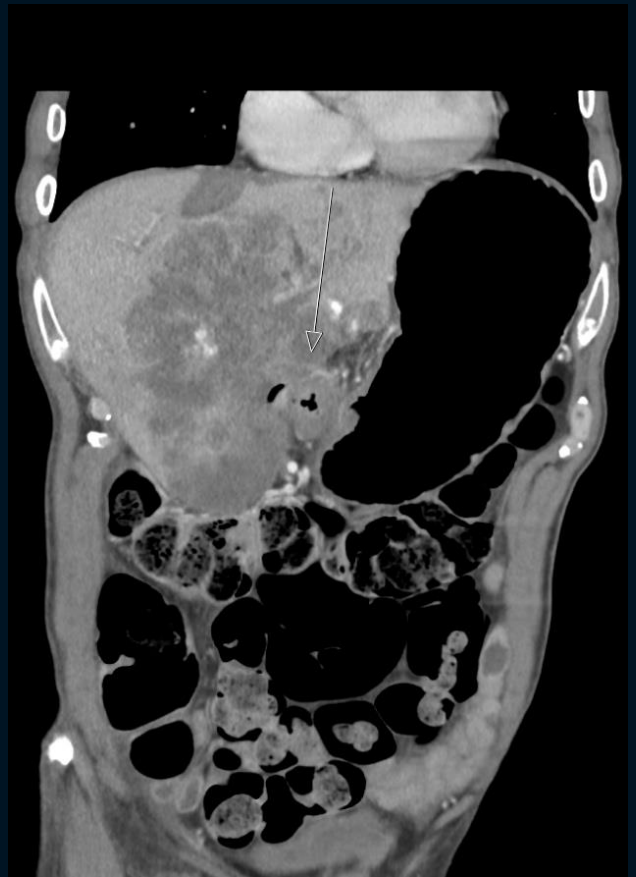
Obstruction due to liver metastases – gastric cancer



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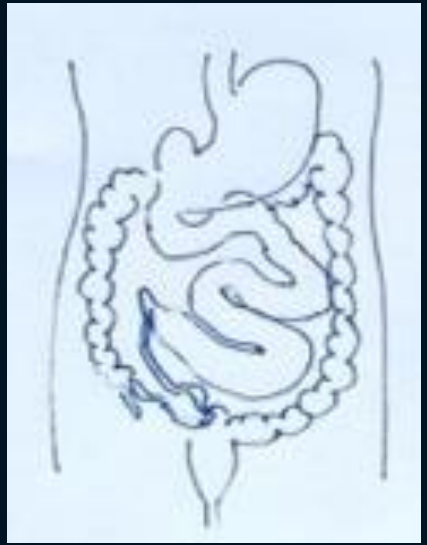
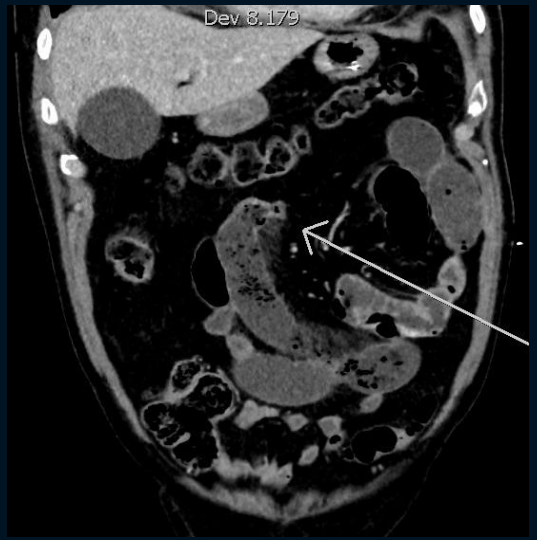
Bowel obstruction – CT signs small bowel

- Dilatation >2.5-3 cm
  - Normal or collapsed bowel distally
- Small bowel feces sign
- Transition zone





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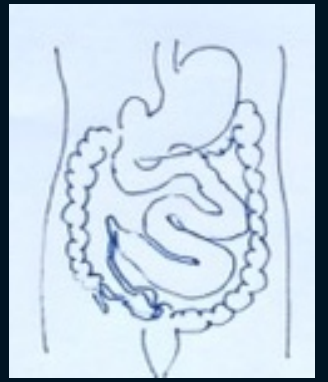
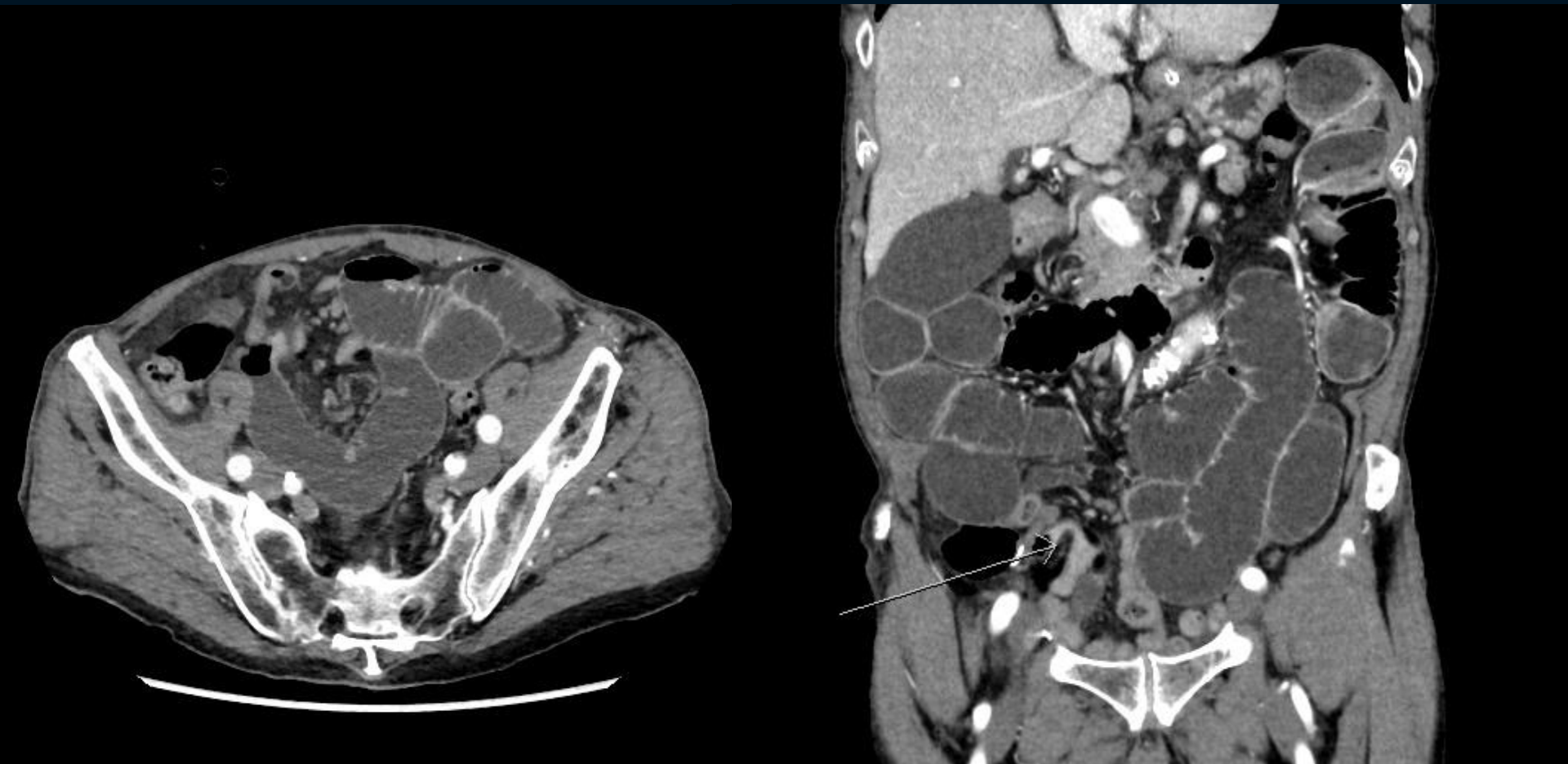
Bowel obstruction – small bowel



- 79-year-old male
- Cystectomy 9 months prior
- Vomiting
- Abdominal pain



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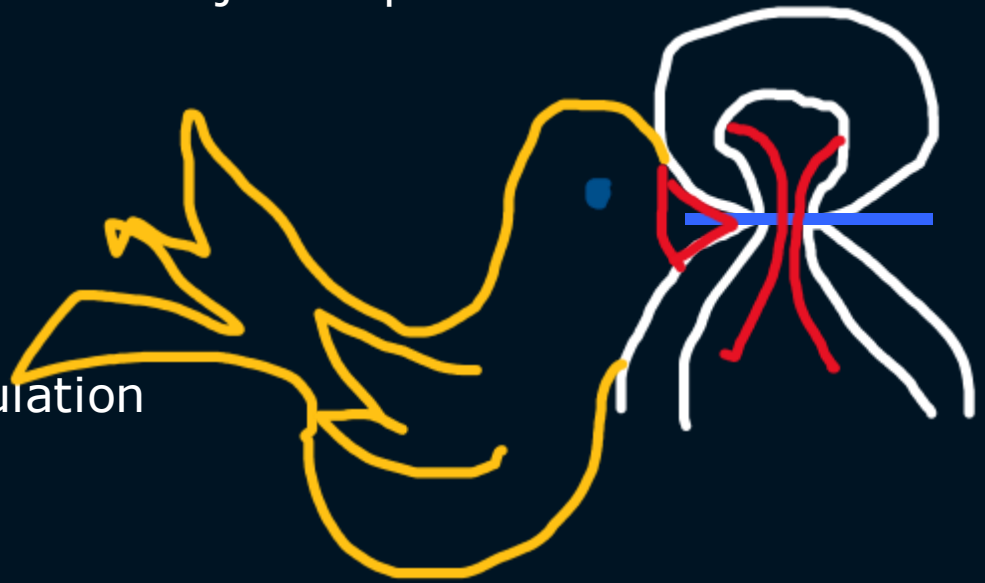
Bowel obstruction – closed loop

- Bowel loop occluded at two adjacent points
- Beak sign
- Whirl sign
- Risk of vessel strangulation



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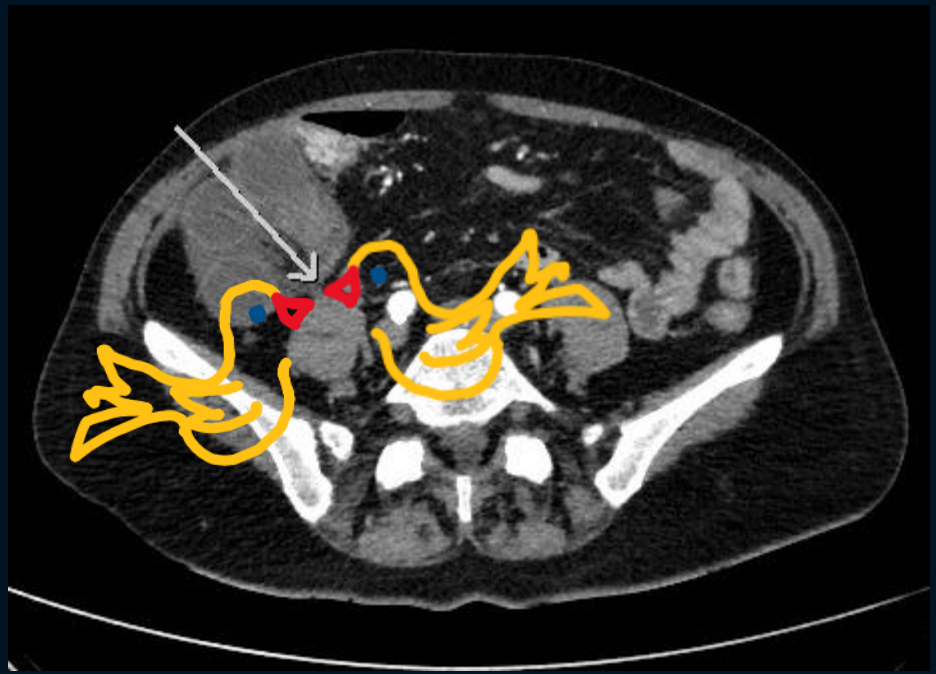
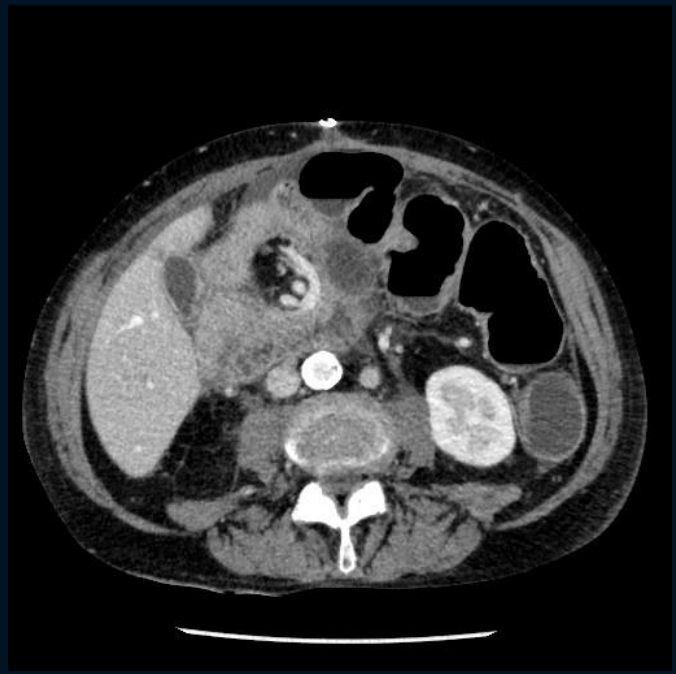
Bowel obstruction – closed loop





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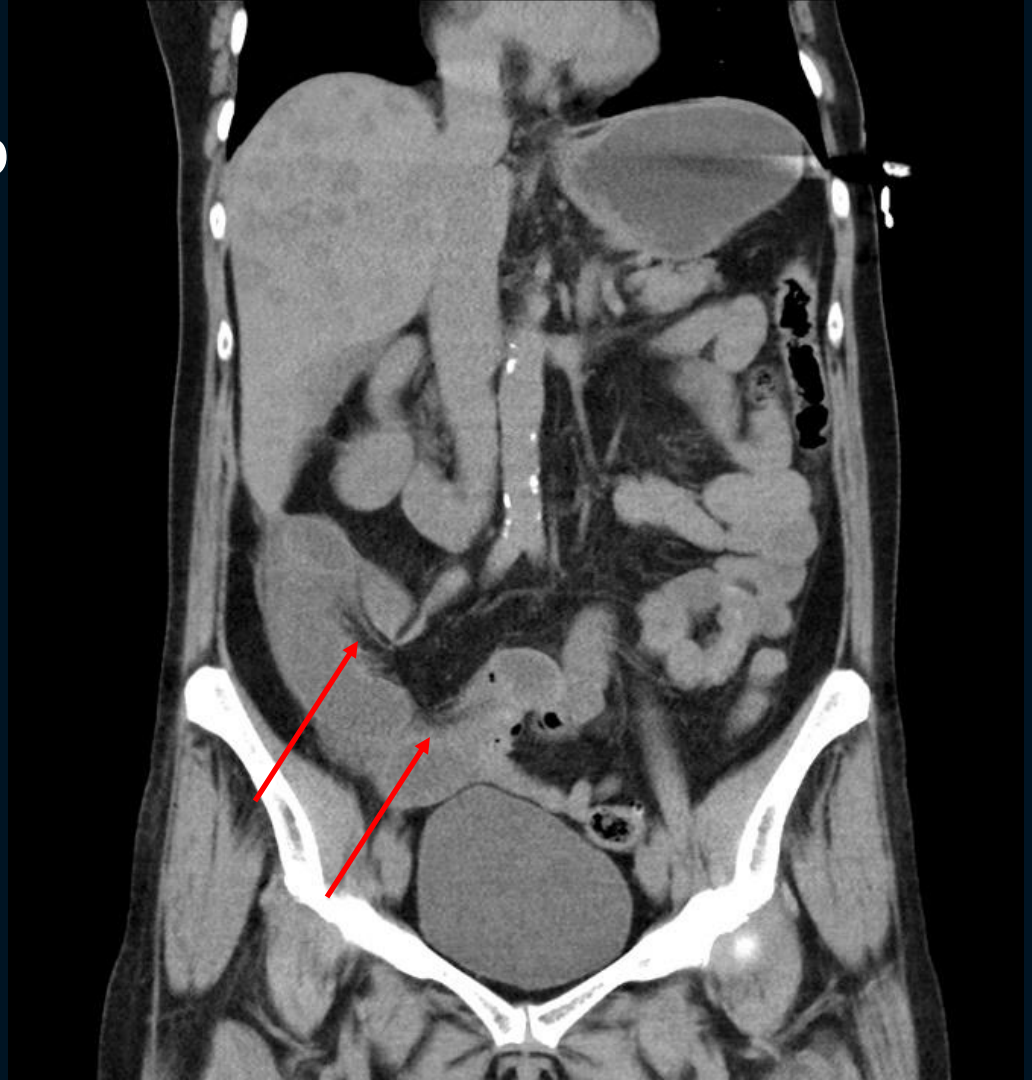
Closed loop



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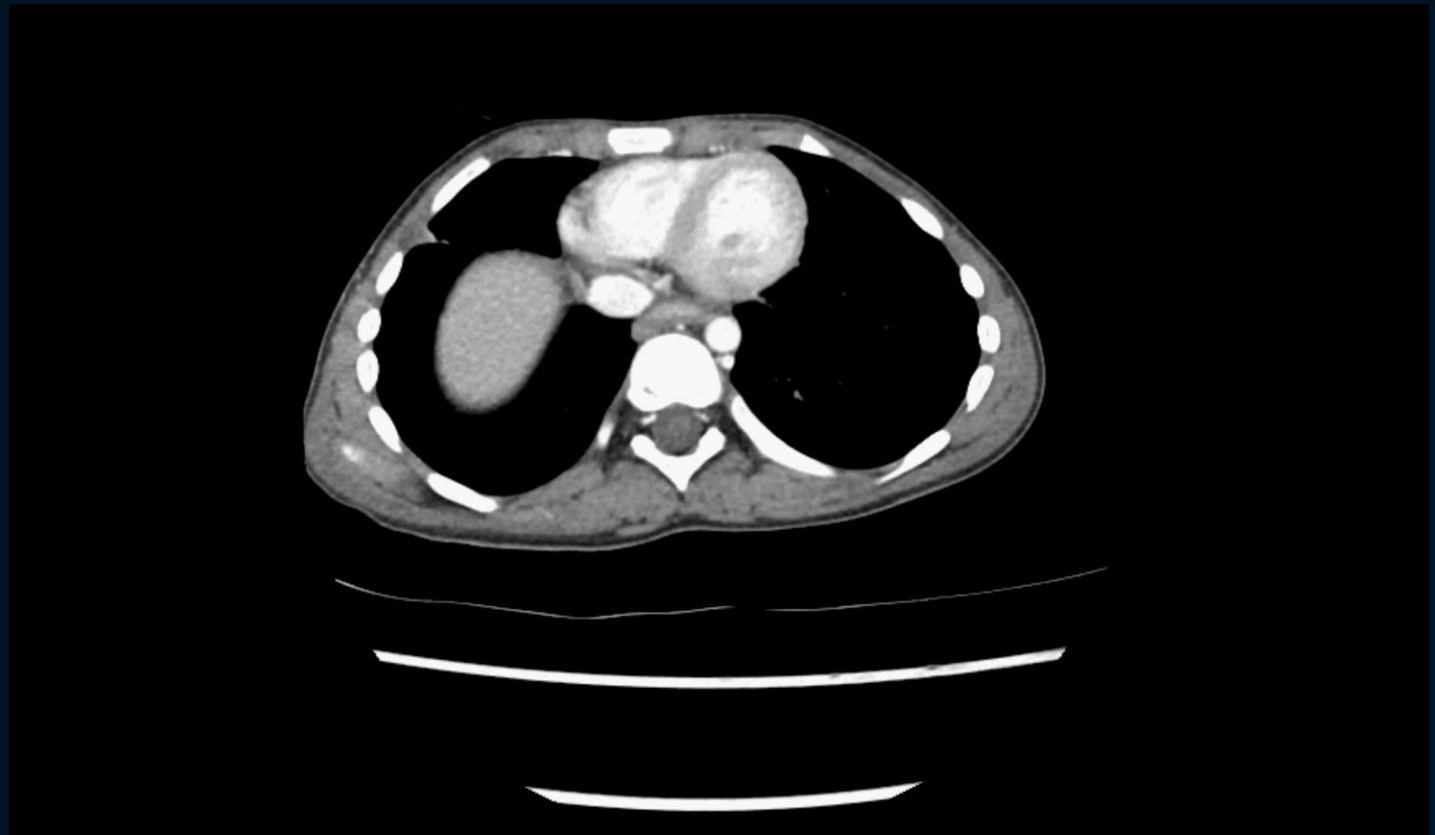
Whirl sign



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Bowel obstruction - large bowel

- > 6 cm – caecum > 9 cm
- Tumor
- Diverticulitis
- Volvulus
  - (Sigmoid more common than caecal)

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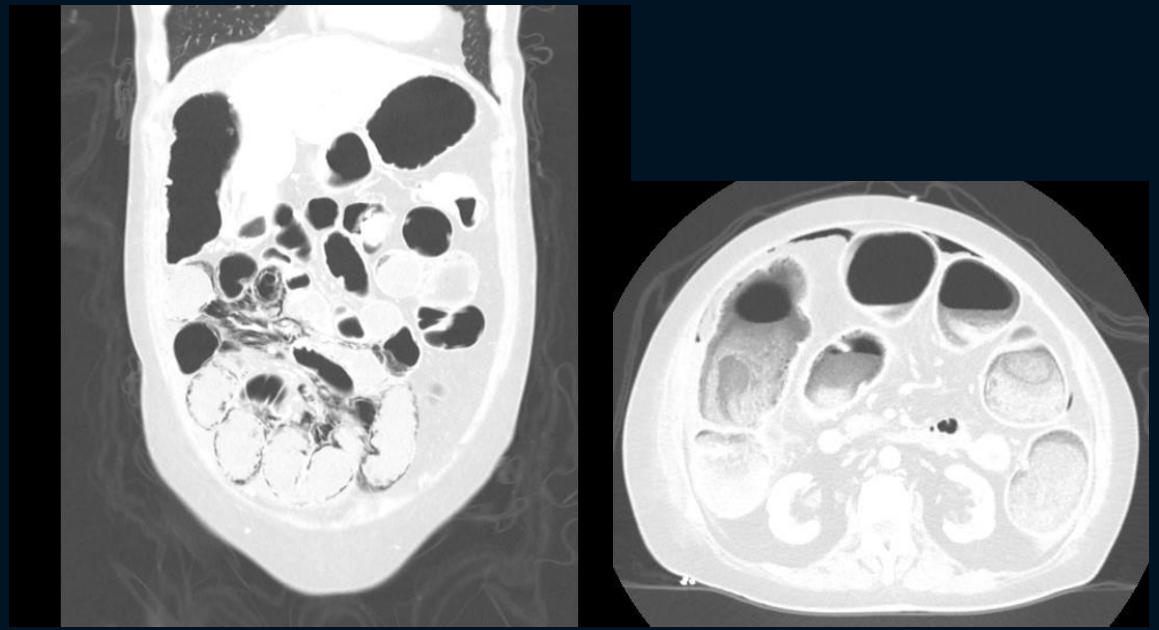
Bowel obstruction - complications

- Strangulation of vessels
- Thickened and increased attenuation in the bowel wall due to venous stasis
- Decreased perfusion of bowel wall
- Ischemia
- Necrosis
- Pneumatosis intestinalis
- Portal venous gas
- Perforation



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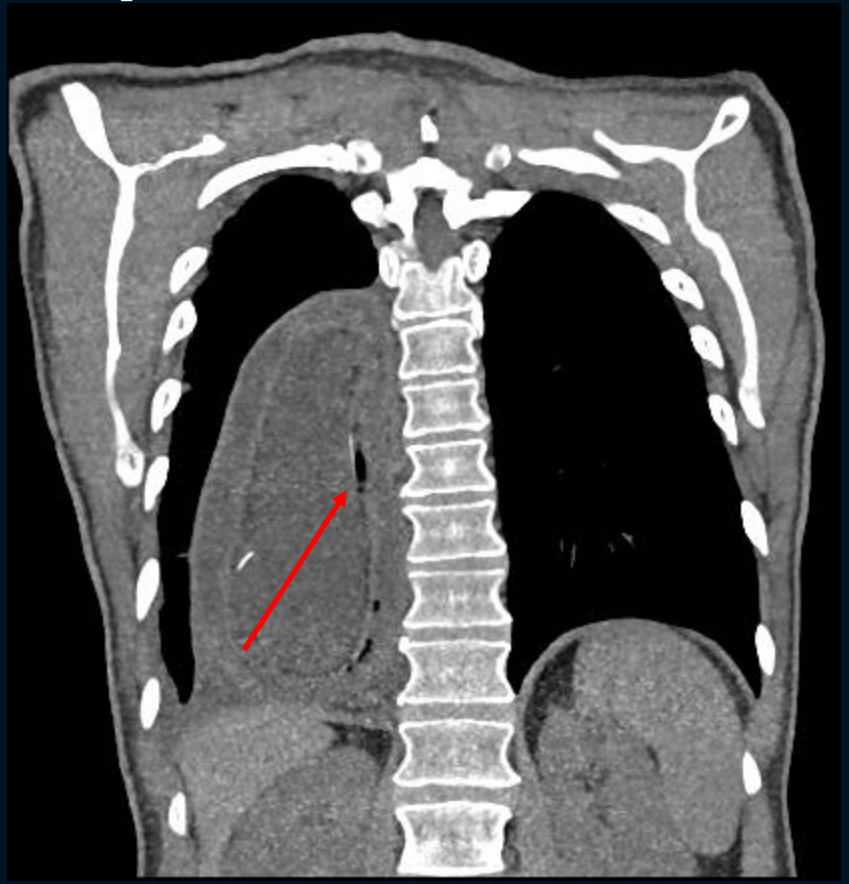
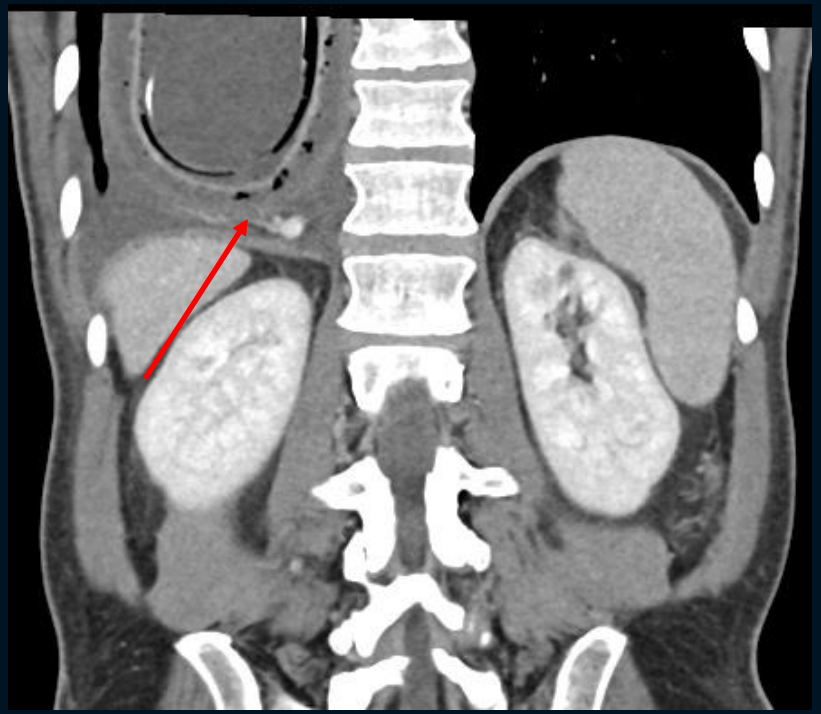
Complications





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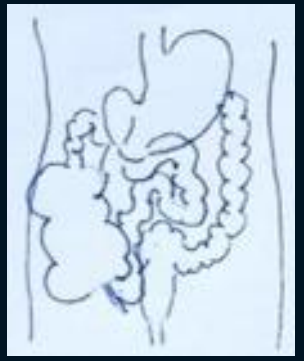
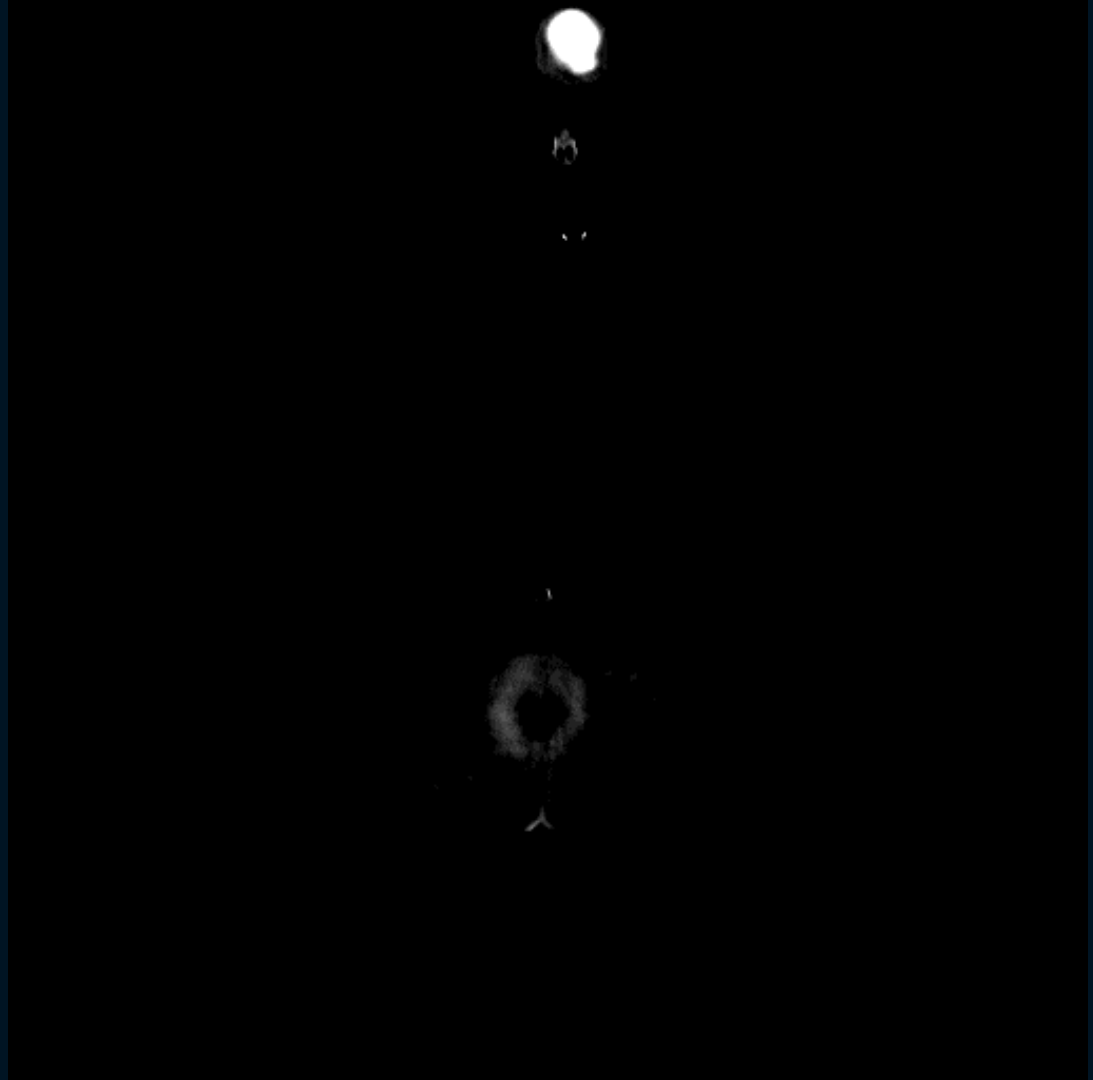
Bowel obstruction - low



- 63-year-olo female
- Abdominal and back pain
- BP ↓ ↑
- Tachycardia
- Type A dissection?



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Caecal volvulus

- 73-year-old female
- Increasing abdominal pain and increasing swelling of the abdomen
- Recent video-assisted thoracoscopic surgery

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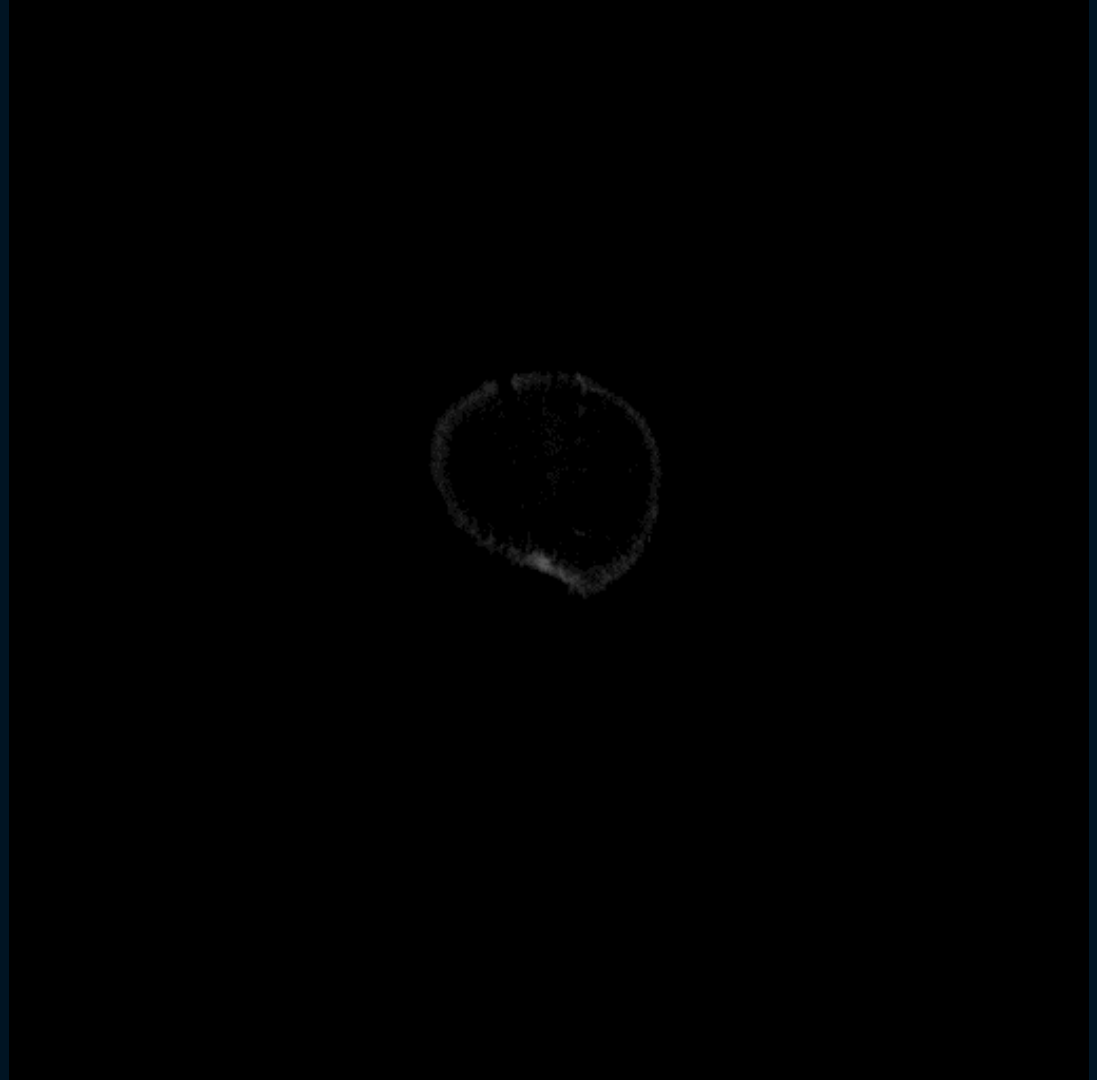
Sigmoid volvulus

- 12-yo girl
- Intellectual disability
- Cystic fibrosis ➡️ obstipation
- Abdominal pain



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For the report

- Answer the clinical question and potential complications
  - "Small bowel obstruction at the level of the ileum. No signs of perforation or ischemia…"
- Think about who the recipient is
  - Surgeon or internal medicine specialist
- Sum up other findings briefly

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Summary

- Ask for history/clinical findings
- CT with iv-contrast agent
- Look for a transition zone
  - Small bowel feces sign
- Look for the reason of obstruction
  - Hernia, tumor etc
- Look for complications
  - Ischemia
  - Pneumatosis
  - Portal venous gas


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