Definition & Anatomy

- Internal hernia through peritoneal defect after gastrojejunostomy
- Herniation between Roux mesentery and transverse mesocolon/retroperitoneum
- Occurs via "Petersen's space"—posterior to gastrojejunostomy
- Most common after Roux-en-Y gastric bypass or Billroth II reconstruction

Clinical Presentation

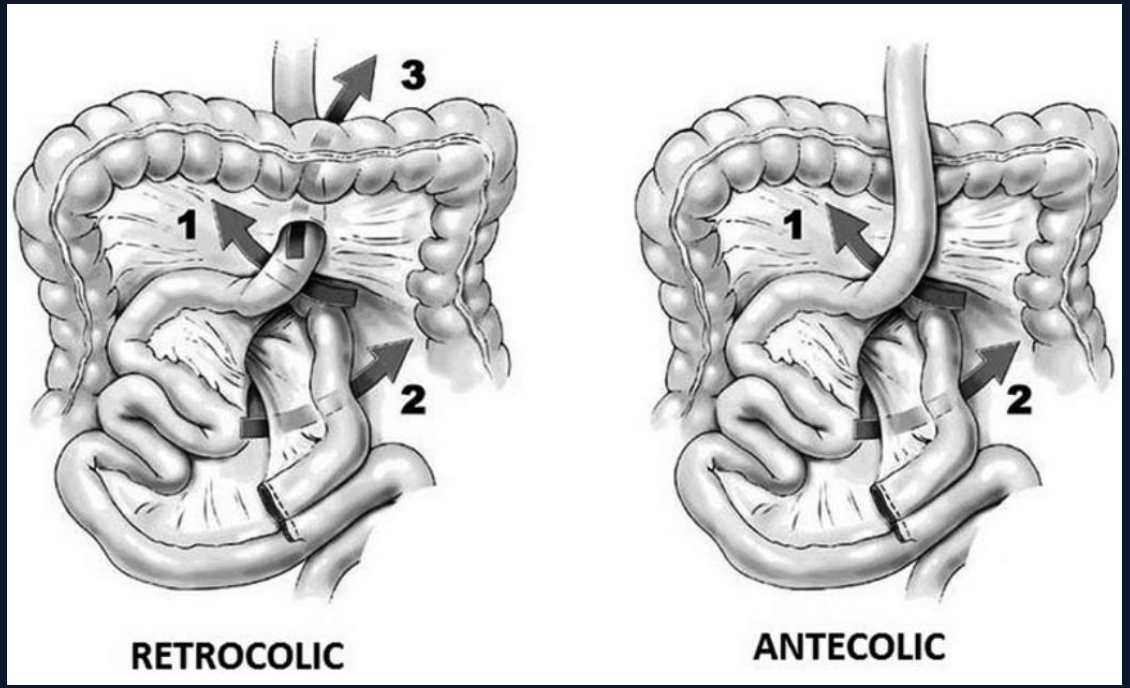
- Intermittent or acute crampy abdominal pain (often postprandial)
- Nausea, vomiting, signs of small bowel obstruction
- Nonspecific symptoms; physical exam often unremarkable
- Rapid progression to closed-loop obstruction and ischemia
- **RED FLAG:** Post-bypass patient with unexplained pain = low threshold for imaging

CT Imaging: Key Signs (Part 1)

- **Mesenteric Swirl/Whirl:** Rotation of mesenteric fat & vessels around central point (70-100% sensitivity, 83% specificity)
- **Clustered Bowel Loops:** Abnormal crowding in left upper/mid abdomen with mushroom-shaped configuration
- **SMV "Beaking":** Tapering of superior mesenteric vein where stretched into defect

CT Imaging: Key Signs (Part 2)

- **Closed-Loop Obstruction:** U- or C-shaped fluid loops with 2 adjacent transition points & radial/converging vessels
- **Vessel Changes:** Engorgement, stretching, "criss-cross" configuration of mesenteric branches
- **Ischemia Indicators:** Bowel wall thickening, reduced enhancement, mesenteric edema, pneumatosis, portomesenteric gas

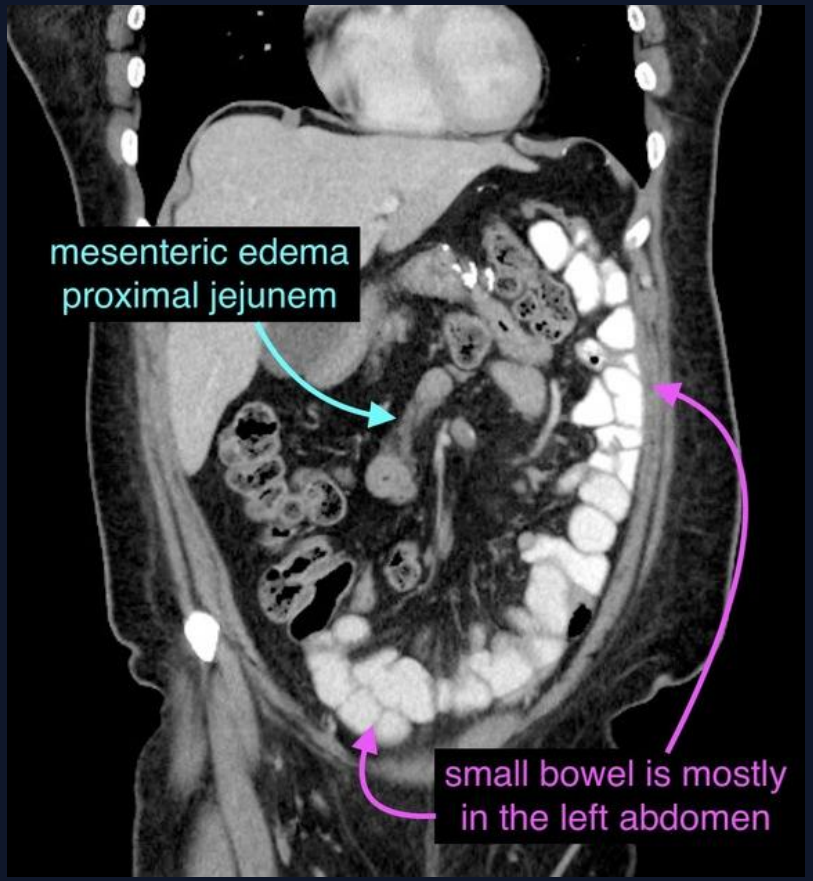


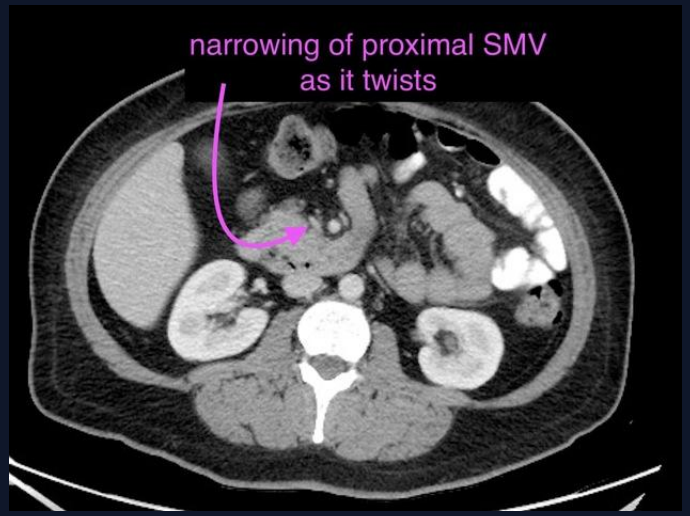
Arrows 1-3 indicate potential spaces for hernia formation:

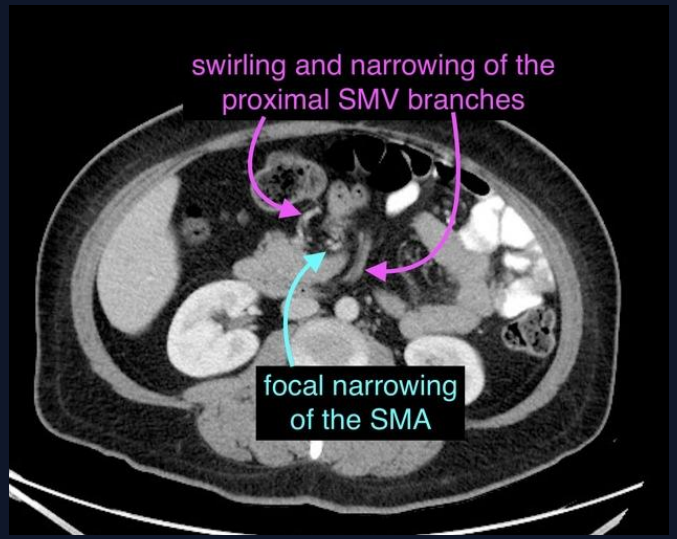
(1) Petersen's space, between the Roux limb mesentery and the transverse mesocolon;

(2) the mesenteric opening at the biliopancreatic limb; and

(3) the opening through the transverse mesentery when the bypass is in retrocolic fashion.


mesenteric edema
proximal jejunem
small bowel is mostly
in the left abdomen


narrowing of proximal SMV
as it twists


swirling and narrowing of the
proximal SMV branches
focal narrowing
of the SMA

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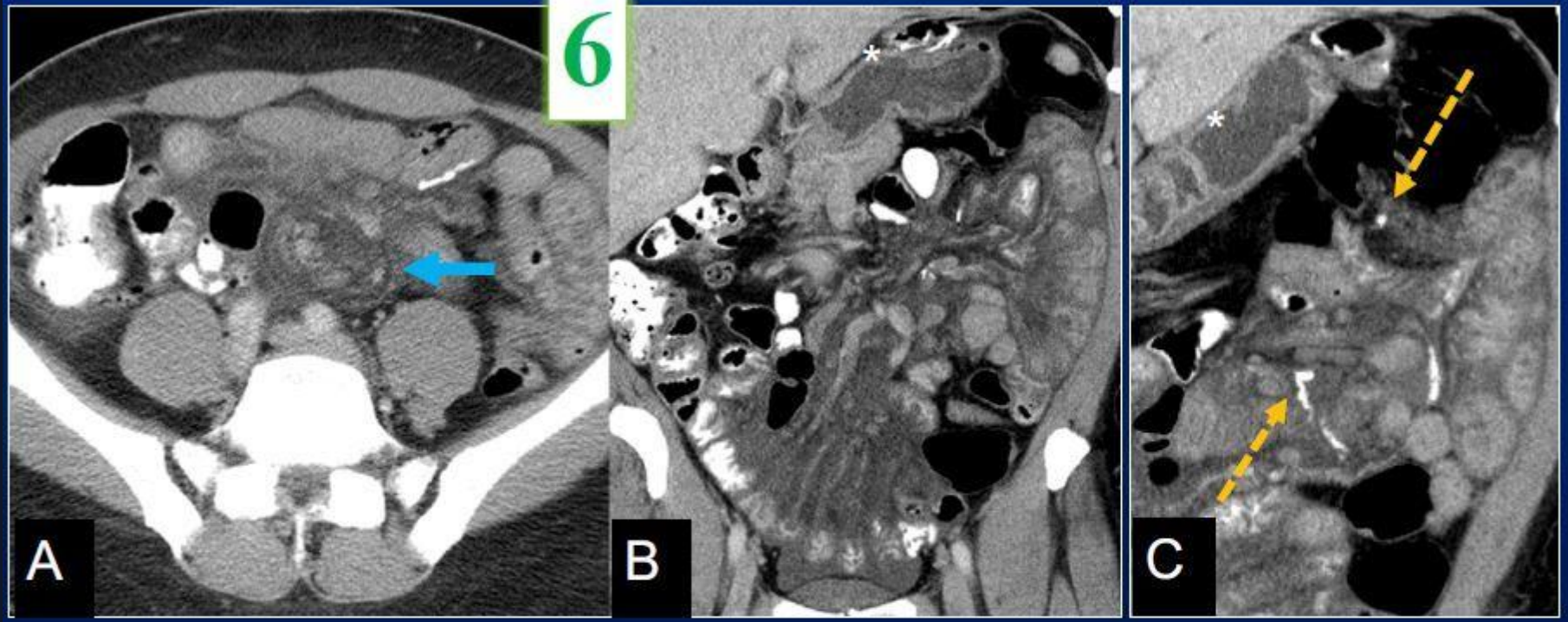

Peterson hernia - A, Axial, B and C coronal CECT of abdomen. **Always watch for twisting of mesenteric vessels** (blue arrow, A) and abnormal orientation of small bowel loops predominantly seen in left upper quadrant.
See large defect in sutures between broken arrows in C.

Diagnostic Performance

Sensitivity

28-70%

CT limited; ~20-30% false-negative rate

Specificity

~90%

High for detecting obstruction

⚠️ Normal/equivocal CT does NOT exclude Petersen hernia—consider diagnostic laparoscopy if persistent symptoms.

Radiology Reporting Tips

- Explicitly search for & describe: mesenteric swirl, clustered loops location, SMV beaking, closed-loop features, ischemic signs
- Use high-suspicion language when swirl/closed-loop present: "Findings highly concerning for internal hernia through Petersen's defect; urgent surgical evaluation recommended"
- Prompt reporting critical—delay significantly increases bowel infarction & loss risk

Management & Outcomes

- **Treatment:** Emergency surgical reduction & mesenteric defect closure (laparoscopy or conversion to laparotomy)
- **Key Finding:** Early surgery → less bowel necrosis & shorter resection length
- **Alternative:** Conversion to Roux-en-Y for better long-term results
- **Prevention:** Routine closure of mesenteric defect at initial bariatric surgery

Clinical Pearl

In any post-Roux-en-Y patient presenting with nonspecific abdominal pain, maintain high suspicion for Petersen hernia.

Time is tissue. Prompt imaging interpretation and surgical notification are essential to prevent devastating complications.