Cecal Volvulus: Case Presentation and Review of CT Findings

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Our Patient LD: History & Physical

HPI:
• 28 y.o. female presents with diffuse abdominal pain; began suddenly this AM, worst in LLQ.
• Began menses yesterday
• Had normal BM without relief
• Denies fever, chills, vaginal discharge, hematuria, dysuria, diarrhea, melena, or hematochezia.
Patient LD: History & Physical (cont.)

• PMH: Ruptured ovarian cyst
• Meds: Oral contraceptives
• Social: Not currently sexually active

• Pertinent exam findings: abdomen soft and mildly distended, moderately tender in all quadrants without rebound or guarding; normal bowel sounds.
Initial Differential: Broad Categories

- Gynecologic (ovarian torsion, ectopic pregnancy, menstrual, etc.)
- Infection (gastroenteritis, pyelonephritis, etc.)
- Primary abdominal pathology (diverticulitis, ischemic bowel, intussusception, etc.)
Patient LD: Initial Labs

- CBC: WBC 5.2, Hct 39.9, Plt 223
- HCG negative
- AST 26, ALT 16, Alk Phos 78, Tbili 0.2, Lipase 32
- UA negative
Patient LD: Initial Imaging

• LD had an abdominal + pelvic ultrasound
• Showed normal ovaries, but large amount of free fluid in the right pelvis
• Next imaging test to work up abdominal pain and free fluid: CT of the abdomen.
  – We will briefly view images from this CT now, but will revisit the findings in more detail later in this presentation.
Patient LD: Abdominal CT Scan 1

Dilated cecum, located in LUQ

Blue Box: Transition point

C- CT abdomen, axial view
PACS, BIDMC
LD: Abdominal CT Scan 2

Whirl Sign

C- CT abdomen, sagittal view
PACS, BIDMC
These findings on CT are diagnostic of cecal volvulus; we will now proceed to briefly review the anatomy of cecal volvulus.

We will then revisit these images in order to review important CT findings of cecal volvulus.
Cecal Volvulus: Definition and Illustration

- Defined as torsion of the bowel around its own mesentery
- This image shows cecum twisting and inverting upward, tangling with ileum.

Sites of Volvulus in the Bowel

- Cecum accounts for 11-40% of intestinal volvulus
- Cecal volvulus usually only occurs in patients with a developmental failure of fixation of proximal right colon to peritoneum
- More common in younger patients
- Sigmoid colon is most common site of volvulus

Prior to reviewing CT findings of cecal volvulus, we will view an abdominal plain film from a companion patient and discuss the diagnostic utility of the plain film for cecal volvulus.
Companion Pt 1: Abdominal Plain Film

Major findings:
• **Focal loop of air-distended bowel**
• **Prominent small bowel (2.8-2.9 cm)**
Plain Films: Diagnostic Utility

• In one large series, plain film suggested diagnosis of cecal volvulus <50% of the time.
• 1/3 of cases were thought to be small bowel obstruction.
• Why might this be? Let us briefly consider a differential diagnosis based on these plain film findings.
Partial Differential Diagnosis
Suggested by Plain Film Findings

- Massively dilated loop of (large) bowel:
  - Distal obstruction
  - Functional obstruction
  - Paralytic ileus (nonobstructive distention)
  - Scleroderma, dermatomyositis
  - Toxic megacolon
  - Congenital / pediatric

- For distended small bowel, add:
  - Drug effect
  - Mesenteric ischemia
  - Postvagotomy
  - Celiac sprue
  - Other malabsorptive syndromes

In part because of this broad differential, plain films are of limited utility in diagnosing volvulus, and CT is preferable.
Important CT Findings of Volvulus

- Severe cecal distention (> 10 cm)
- Whirl sign, transition point(s)
- Dilation and fecalization of small bowel
- Decompression of colon
- Split wall sign
Pt LD: Whirl Sign on CT

Whirl Sign / Hurricane Sign

• An important defining sign of volvulus


C- CT abdomen, sagittal view PACS, BIDMC
Sequential axial CT images showing transition points in small and large bowel.
Left (arrow): proximal dilated cecum transitioning to narrowed, collapsed distal colon.
Right: proximal small bowel (arrow) entering into twist (box) with large bowel.
Companion Pt 1: Whirl Sign (Axial View)

Dilated cecum, seen here closer to midline

Blue Box: Whirl Sign

Our companion patient provides another example of the whirl sign.

C- CT abdomen, axial view
PACS, BIDMC
Companion Pt 1: Whirl Sign (Coronal View)

This coronal view of our companion patient clearly demonstrates the whirl sign, with distended large bowel entering into the twist.

C- CT abdomen, coronal view
PACS, BIDMC
Important CT Findings of Volvulus: Progress

- Severe cecal distention (> 10 cm)
- Whirl sign, transition point(s)
- Dilation and fecalization of small bowel
- Decompression of colon
- Split wall sign
Companion Pt 1: Fecalized Small Bowel

Fecalized Small Bowel, suggesting distal obstruction

C- CT abdomen, coronal view
PACS, BIDMC
Companion Pt 2: Decompressed Colon

Here, we see decompressed right colon distal to the point of volvulus. Oral contrast has not reached this loop, and it appears collapsed.

Companion Pt 3: Split Wall Sign

Split Wall Sign: Apparent splitting of colon wall by mesenteric fat.

Caused by adjacent mesenteric fat invagination in a twisted loop of bowel.

Important CT Findings of Volvulus: Complete

✓ Severe cecal distention (> 10 cm)
✓ Whirl sign, transition point(s)
✓ Dilation and fecalization of small bowel
✓ Decompression of colon
✓ Split wall sign
Our Patient LD: Clinical Outcome

- LD had an emergent exploratory laparotomy, with no signs of bowel ischemia
- Ileocolicectomy was performed without complication
- LD recovered well and was discharged on post-operative day 4.

References

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