Emergency Radiology, 1st Nordic Course
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Left Lower Quadrant Pain

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Differential Diagnosis: LLQ Pain

Gastrointestinal
Diverticulitis
Epiploic Appendagitis
Ischemic Colitis
Colon Cancer
Volvulus

Gynecological
Hemorrhagic Ovarian Cyst
Ruptured Ovarian Cyst
Ectopic Pregnancy
Adnexal Torsion
PID with TOA
Degenerating Uterine Leiomyoma

Urological
Nephrolithiasis
Pyelonephritis
Hydronephrosis

Intraperitoneal Causes of LLQ Pain

- Diverticulitis
- Mimics of Diverticulitis:
  - Epiploic Appendagitis
  - Ischemic Colitis
  - Colon Cancer
  - Volvulus

Diverticulosis

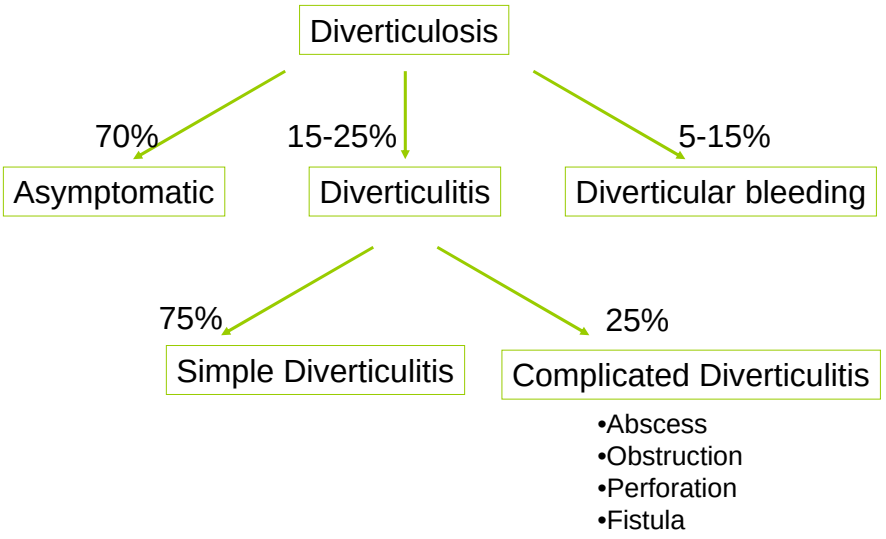
Diverticulum

- Latin for a “small diversion from the normal path”
- Outpouching through a weak spot in the colon wall
- 5-10% Americans age 40-60
- 50% Americans age 60-80

Diverticulitis

- Inflammation of diverticula
- Obstruction at the neck of a diverticulum leads to inflammation, infection and bowel wall thickening

Complications of Diverticulosis



Clinical Presentation of Diverticulitis

LLQ pain for a couple of days	93-100%
Fever	57-100%
Leukocytosis	69-83%
Nausea/vomiting	20-62%
Constipation	50%
Diarrhea	25-35%
Urinary (dysuria, frequency, urgency)	10-15%

Misdiagnosis rates without imaging up to 34%

MDCT Protocol for Diverticulitis

- *Contrast Materials:*
  - Oral: 3 cups of 1/4oz Gastrograffin in 10oz water
  - IV: 75-125cc of 370 concentration @ 3.0 cc/sec
- *Scanning Parameters:*
  - Start scan after 70sec delay
  - View slices at 5mm or 2.5mm thicknesses
  - Reformat to thin 1.25mm or 0.625mm slices for coronal and sagittal reformations

CT Findings in Diverticulitis

- *Colonic Findings*
  - Wall thickening (symmetric or asymmetric), muscular wall hypertrophy, diverticulosis, inflamed diverticulum, sinus tract, arrowhead sign
- *Pericolonic Findings*
  - Fat stranding, free fluid, fascial thickening, phlegmon, abscess, fistulae

Frequency of CT Findings

- Findings of diverticulitis
  - Paracolonic fat stranding 100%
  - Diverticula 97%
    - With or without fecalith
  - Focal colon wall thickening 94%
    - Greater than 5mm
  - Muscular hypertrophy 90%
  - Free air 21%
  - Abscess/phlegmon 21%
  - Free fluid 8%

*CT Signs of Diverticulitis; 114 Positive Cases

Signs	Sensitivity	Specificity
Bowel Wall Thickening	96%	91%
Fat Stranding	95%	90%
Diverticula	91%	67%
Fascial Thickening	50%	100%
Free Fluid	45%	97%

Signs	Sensitivity	Specificity
Inflamed Diverticulum	43%	100%
Free Air	30%	100%
Arrowhead Sign	16%	100%
Abscess	8%	99%
Phlegmon	4%	100%

**AJR 2002 – Kircher M.F., Rhea J.T., Kihiczak D., Novelline R.A. 178 (6):1313*

*Accuracy of MDCT Diagnosis of Diverticulitis; 312 Cases at MGH

Diverticulitis identified in 114 (37%) cases

Alternative conditions diagnosed by CT when diverticulitis not present in 134 (70%) of 192

- Sensitivity 99%
- Specificity 99%
- Pos Predictive Value 99%
- Neg Predictive Value 99%
- Overall Accuracy 99%

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Location of Diverticulitis at CT; 114 Positive Cases

- Sigmoid colon 63 (55%)
- Junction sigmoid/descending colon 19 (17%)
- Descending colon 18 (16%)
- Ascending colon 13 (11%)
- Cecum 2 (2%)
- Transverse colon 1 (1%)

In two patients diverticulitis was identified at two sites (both ascending and descending or sigmoid)

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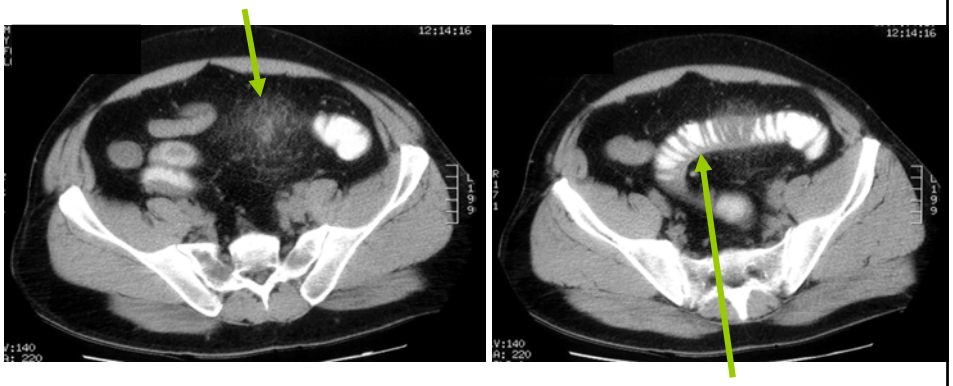
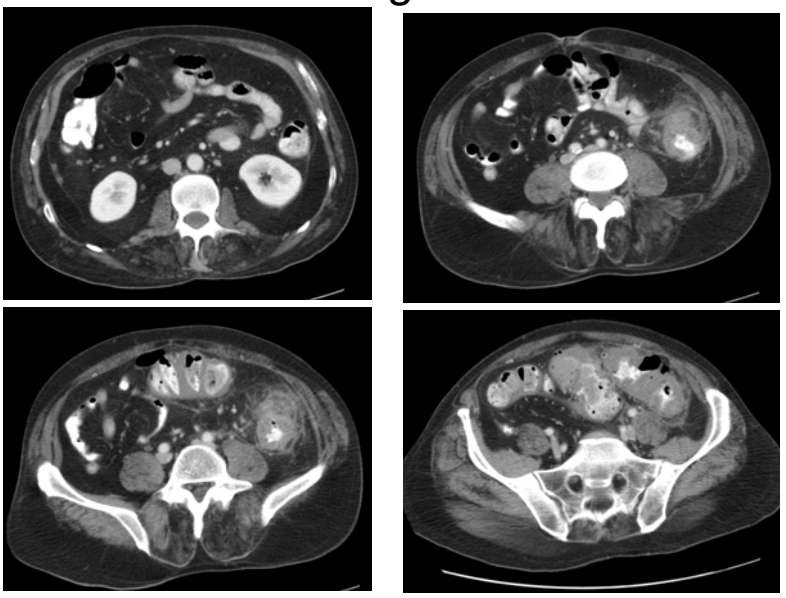
Simple Diverticulitis

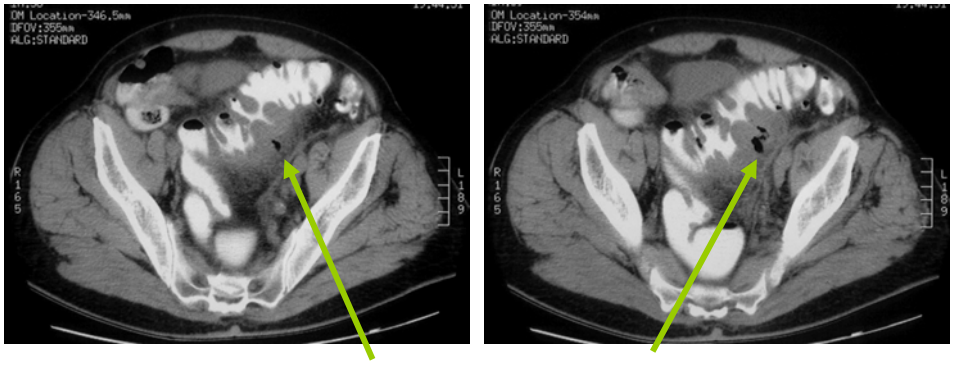


Extensive Diverticulitis

Role of Coronal/Sagittal Reformations



Diverticulitis with Paracolic Abscess Formation

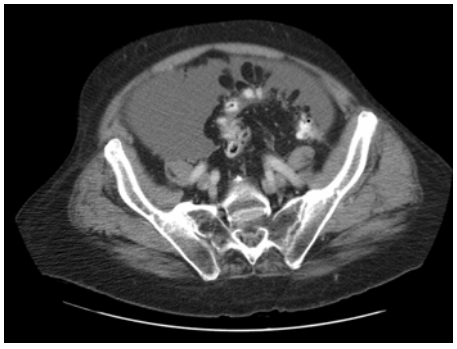


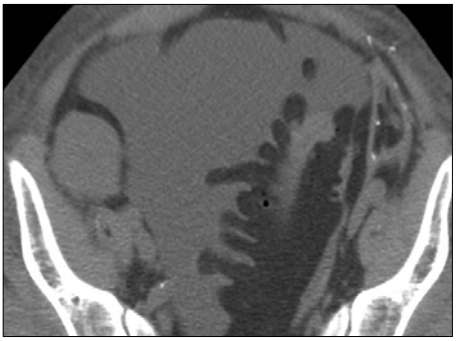
Acute Epiploic Appendagitis (AEA)

What Are Epiploic Appendages?

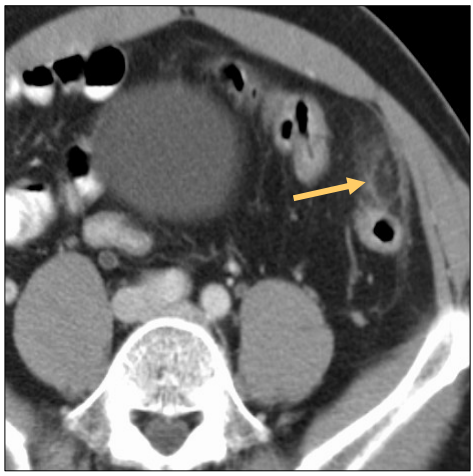
- Fingerlike projections of adipose tissue arranged in parallel rows along the colon
- These projections can torse, becoming ischemic

Epiploic Appendages Shown with Ascites





CT of Epiploic Appendagitis



- Paracolic 1-4 cm oval fat density surrounded by inflammatory fat stranding
- May be slightly denser than normal fat and have a central blood vessel denisty
- May show adjacent bowel wall thickening

Clinical Presentation Of Epiploic Appendagitis

- Abrupt onset of <u>focal</u> severe abdominal pain
- Patient does not appear ill
  - Unusually afebrile and normal WBC
  - May have low grade fever and WBC up to 12.0
- Pain is usually non-migratory
- Symptoms worsen with coughing, deep breathing and abdominal stretching
- No change in bowel habits
- On clinical presentation alone cannot be distinguished from diverticulitis or appendicitis

Why is it Important to Correctly Diagnose Epiploic Appendagitis?

- Commonly mistaken clinically for appendicitis or diverticulitis
- Self-limited condition
- Can be managed with analgesics
- No antibiotics needed
- Does not require surgical intervention

Summary
Acute Epiploic Appendagitis (AEA)

- Importance of condition is the frequent clinical misdiagnosis as acute diverticulitis
- Condition has benign, self-limited course, majority of symptoms subsiding in 2 weeks
- Seen more frequently today due to increased use of emergency CT
- Treatment: Medical management, motrin

LLQ Pain with Colon Cancer

- Patients with acutely obstructing cancers of the descending and sigmoid segments of colon may present with LLQ pain
- 95% are adenocarcinomas
- More common after 50 years
- More common with a family history
- May also have history of gas pains, bloating, blood in stool, change in bowel habits, diarrhea, constipation, weight loss

CT Findings in Acutely Symptomatic Colon Cancers

- Colon cancer appears as a discrete soft tissue mass that narrows the colon lumen
- May also appear as focal colonic wall thickening and luminal narrowing
- With obstruction CT can show extent of obstruction and obstructing lesion
- With perforation CT can show free air/free fluid
- With fistula formation CT can show connection with another organs
- CT may show adenopathy and distant metastases to the liver and other organs

Sigmoid Volvulus

- Most common form of volvulus
- Twisting of sigmoid about mesenteric axis
- Responsible for 8% of all intestinal obstructions
- Abdominal pain, distension and constipation
- More common in older patients (>50 years)
- Predisposing factors:
  - Chronic constipation, megacolon, mobile colon

CT Findings in Sigmoid Volvulus

- CT shows:
  - Twisted sigmoid loop: “whirl sign”
  - Bowel obstruction proximal to the sigmoid
  - Rectal contrast will show a ‘beak sign”
  - Bowel wall thickening evidence of edema
  - Grave signs include intramural gas, portal venous gas or perforation

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Intraperitoneal Causes of LLQ Pain

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  - Colon Cancer
  - Sigmoid Volvulus

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