

Acute Abdomen: Part 1 RLQ Pain

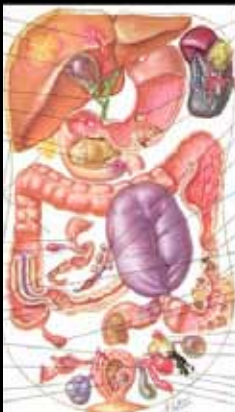


Michael P. Federle, MD
Associate Chair for Education
Department of Radiology
Stanford University



Acute Abdomen

- Definition:
 - Severe abdominal pain developing over several hours
 - (at least one surgical resident thinks the patient needs surgery)



Netter: *Digestive System*

Acute Abdomen

- Numerous GI, GU, gynecologic causes
- Many (most) do not require surgery (e.g. pancreatitis, diverticulitis, gyn)
- Diagnosis often in error by clinical exam
 - CT may yield specific diagnosis (or, at least, Rx)
 - Modify treatment in at least 30% of cases

Taourel et al. 1992: *Gastrointest Radiol*
*Gore et al. 2000: *AJR* (great review article)
Siewert, Raptopoulos. 1994: *AJR*

Appendicitis

- Most common cause of acute abdomen (in US)
- Affects 6% of population (250,000 cases/yr)
- Diagnosis often in error
 - Children (poor historians)
 - Elderly (confusing signs & symptoms)
 - Young women
 - 40% get unnecessary lap (PID, usually)
- Missed Dx of appy most common malpractice claim (ER MDs)

Appendicitis

- Simple – minimal morbidity + mortality
- Perforated – morbidity 30%, mortality 3%
- US Dx: good in experienced hands + thin patients
- CT Dx: less operator + patient dependent



Federle: *Di: Abdomen*

CT of Appendicitis

- Inflamed appendix
 - Tubular, thick-walled, no contrast in lumen
 - (> 7 mm)
 - Periappendiceal inflammation
 - Maybe not in early appendicitis
 - Thick wall of adjacent cecum
 - Appendicolith (30% to 45%)
 - Much more common than on plain film



Federle: *DI: Abdomen*

Accuracy of "Nonfocussed CT" for Appendicitis

- 5 year review of 650 adults at UCLA
 - Sensitivity 96.5%
 - Specificity 98.0%
 - Accuracy 97.6%
 - Pos pred value 94.5%
 - Neg pred value 98.8%
 - (alternative Dx 66.2%)

Raman et al. *AJR* 2002; 178:1319

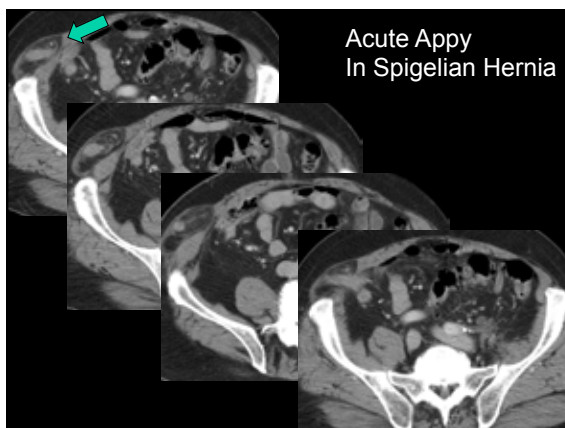


Tip of appendix can lie almost anywhere in abdomen

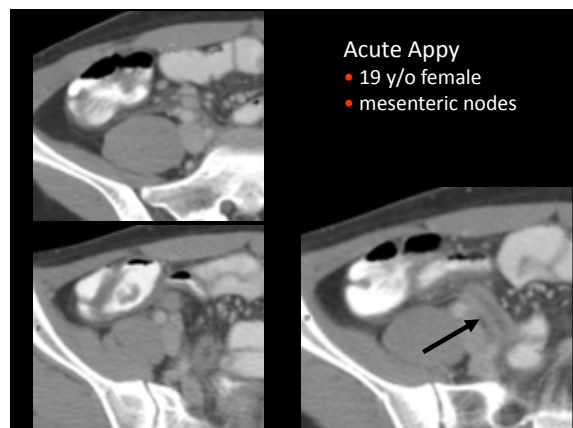
Netter: *Digestive System*



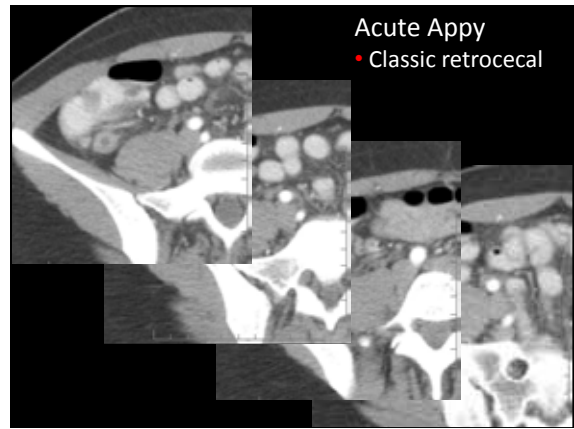
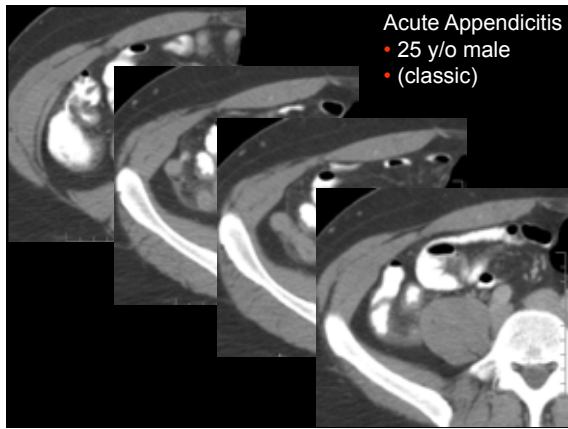
Appendix in Inguinal Hernia



Acute Apyy In Spigelian Hernia

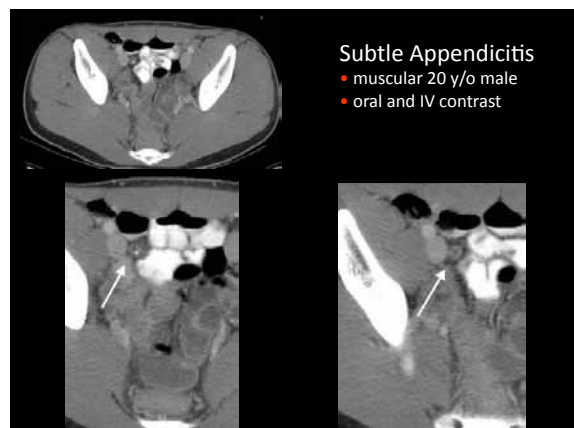
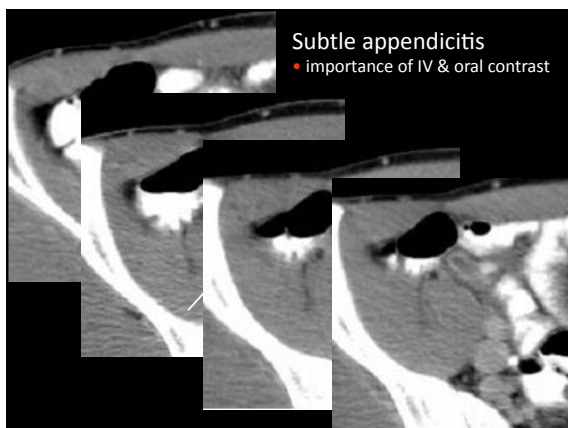


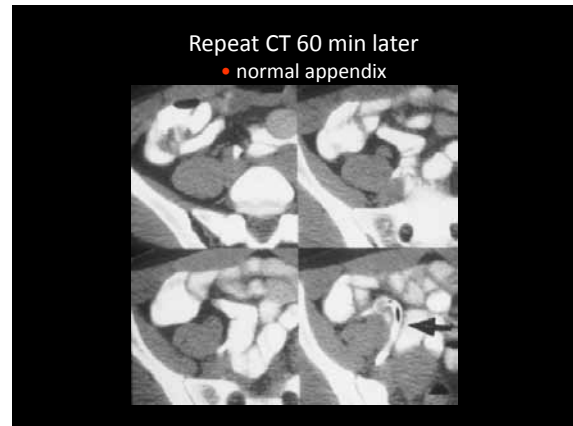
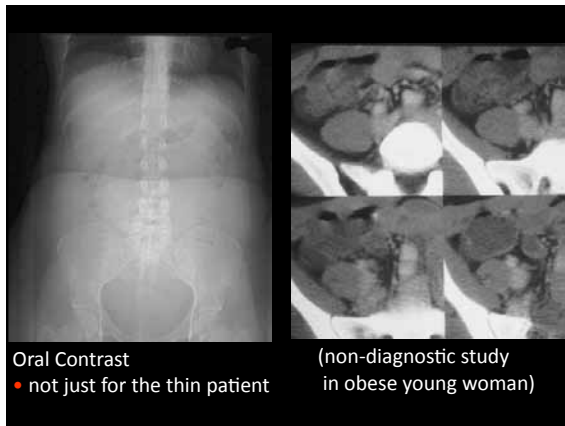
Acute Apyy
 • 19 y/o female
 • mesenteric nodes



Appendicitis: CT Technique

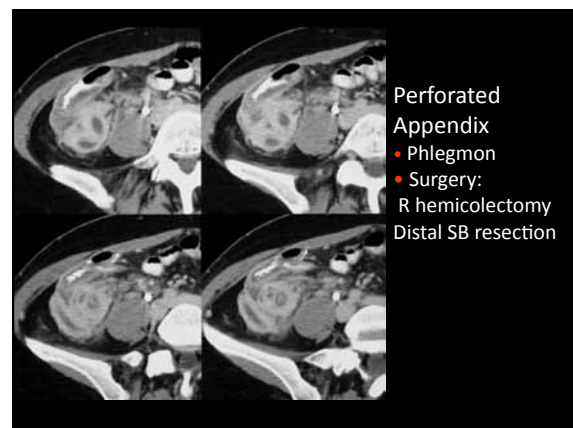
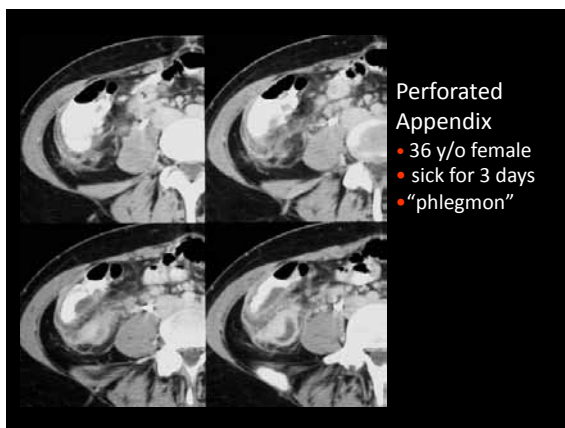
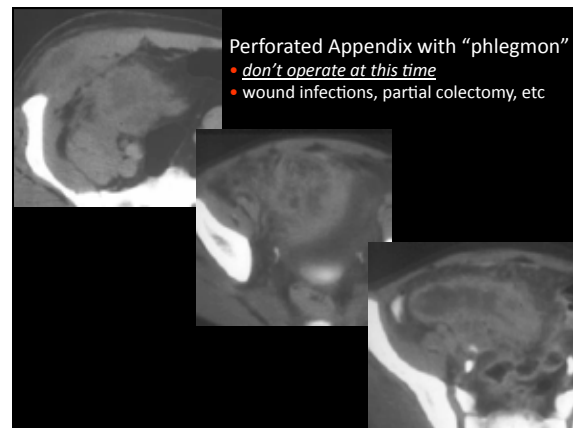
- Our practice =
 - Oral + I.V. contrast
 - abdomen/pelvis
 - 2.5 mm collimation (reconstructed from thinner sections)
- No oral or I.V.
 - Accurate for experienced reader
 - Hard to see wall of abscess, pyelonephritis, etc
- “Focused appendix”
 - Limit field of coverage, rectal contrast
 - We never use this protocol

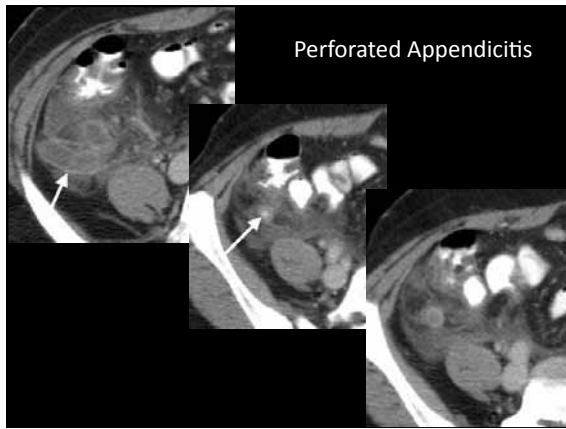




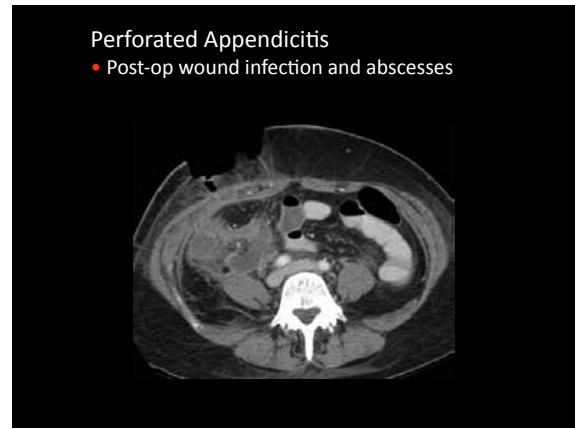
Complicated Appendicitis

- Often symptomatic for days
- Have a palpable tender mass
- CT critical in Dx + Rx
 - “Phlegmon” ☒ antibiotics, *not* surgery
 - Abscess ☒ percutaneous drainage
 - Inaccessible abscess or generalized peritonitis ☒ surgery



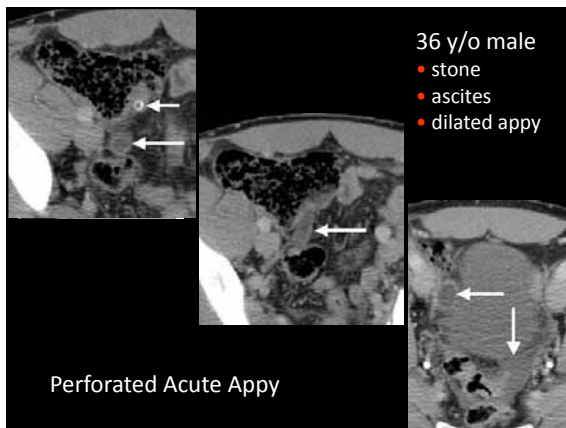


Perforated Appendicitis



Perforated Appendicitis

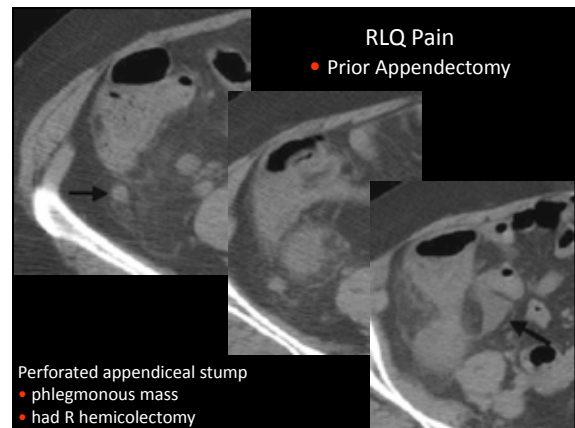
- Post-op wound infection and abscesses



36 y/o male

- stone
- ascites
- dilated appy

Perforated Acute Appy



RLQ Pain

- Prior Appendectomy

Perforated appendiceal stump

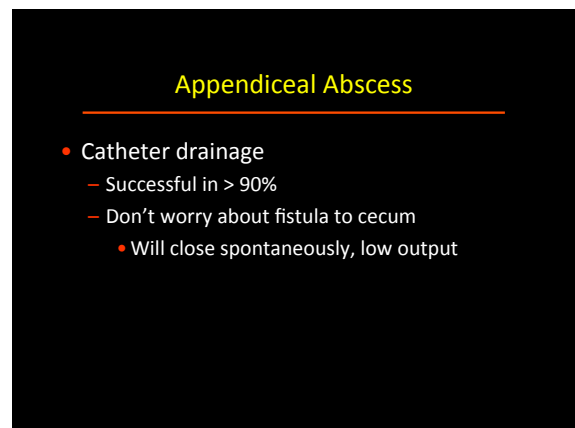
- phlegmonous mass
- had R hemicolectomy



Abscess in Morison's Pouch

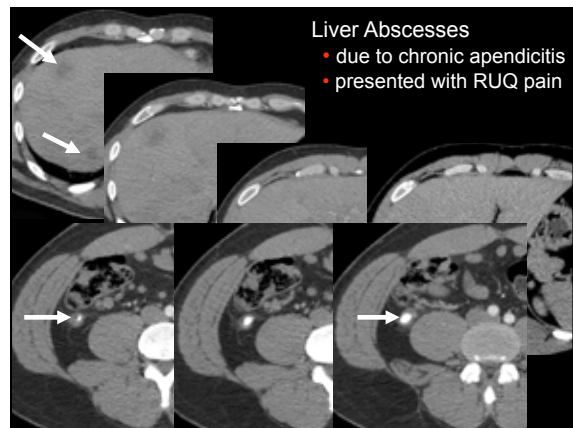
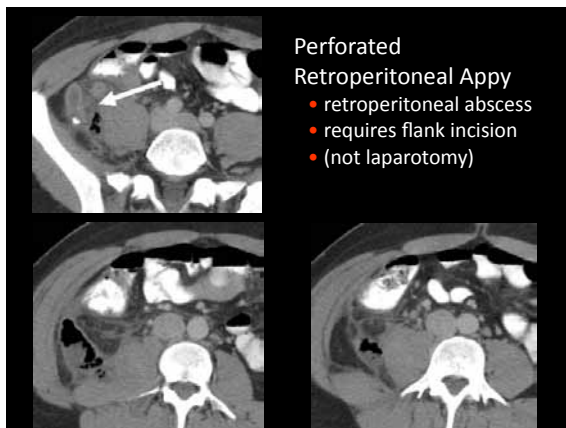
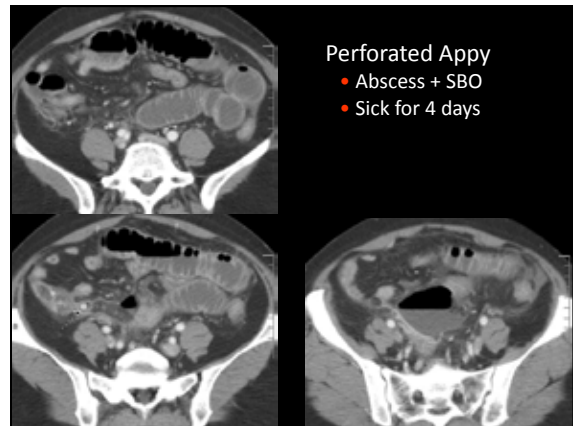
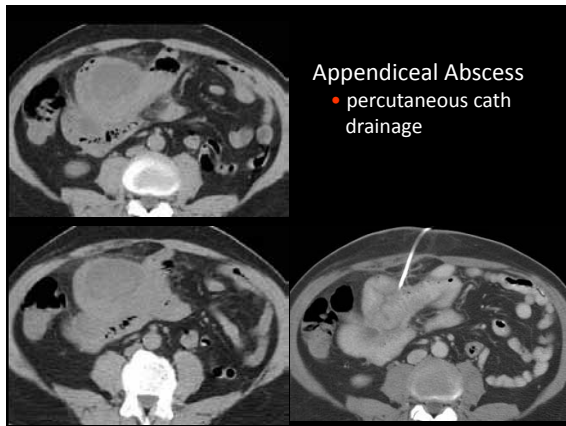
- dropped appendicolith at prior lap appy

Courtesy: Cliff Stamler MD



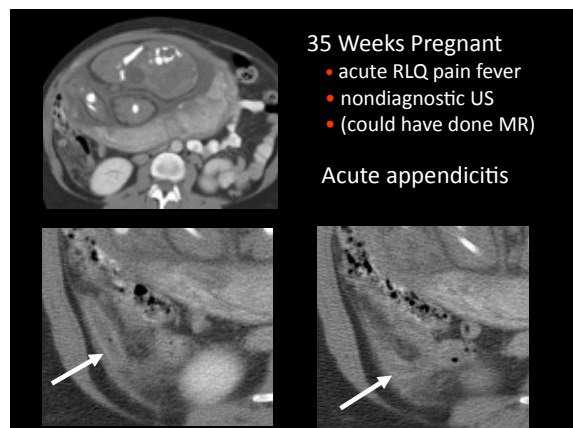
Appendiceal Abscess

- Catheter drainage
 - Successful in > 90%
 - Don't worry about fistula to cecum
 - Will close spontaneously, low output



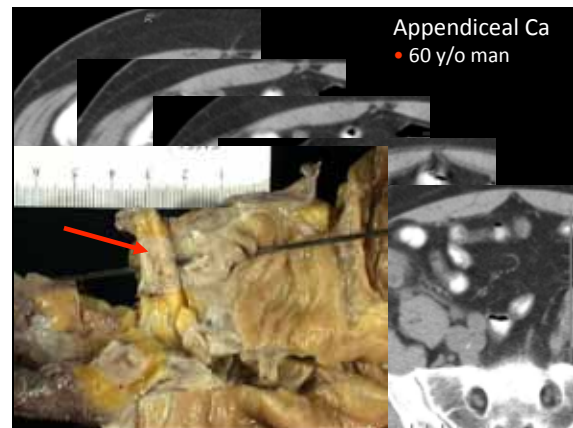
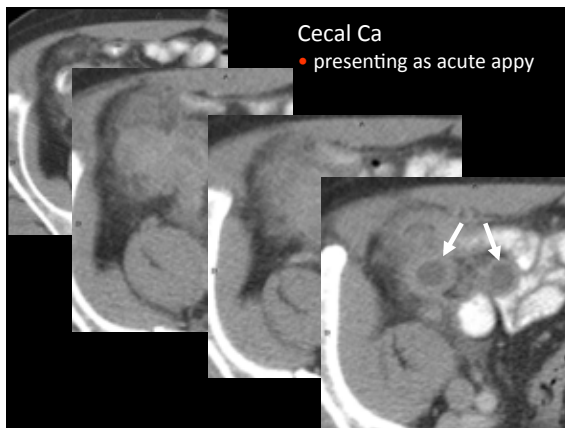
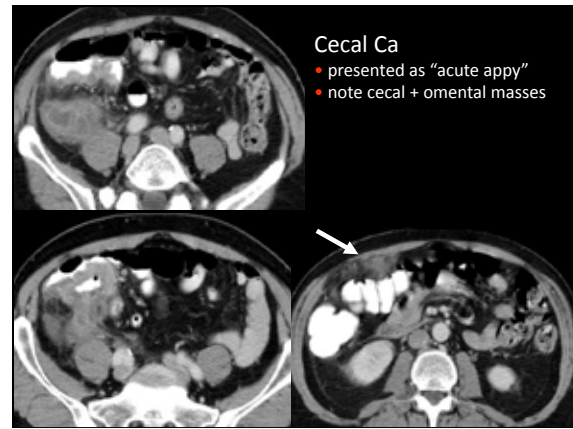
Appendicitis:
Imaging Recommendations

- No imaging
 - Typical presentation, esp young man
- Sonography
 - Children
 - Young women (CT may still be necessary)
- CT
 - Elderly, obese
 - Palpable mass
 - Sx for more than 2–3 days



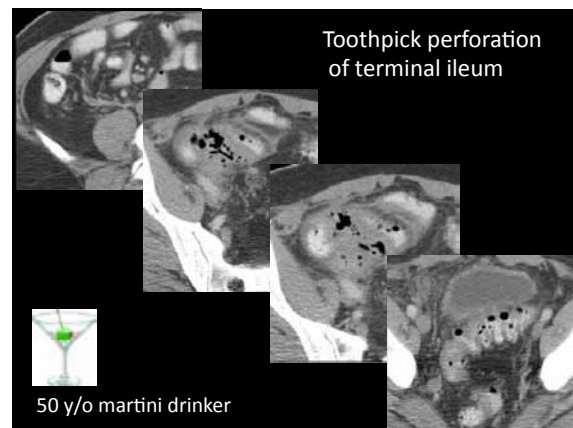
Dilated Appendix Without Inflammation

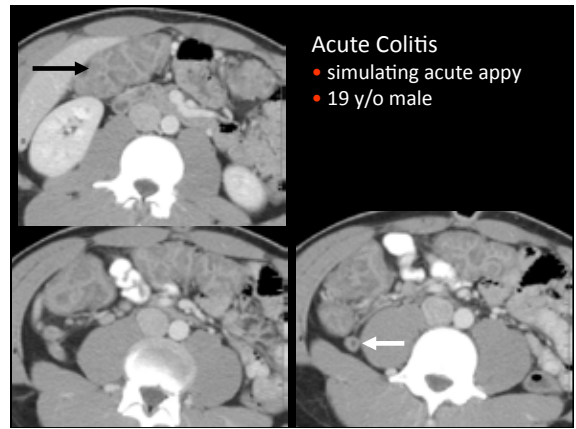
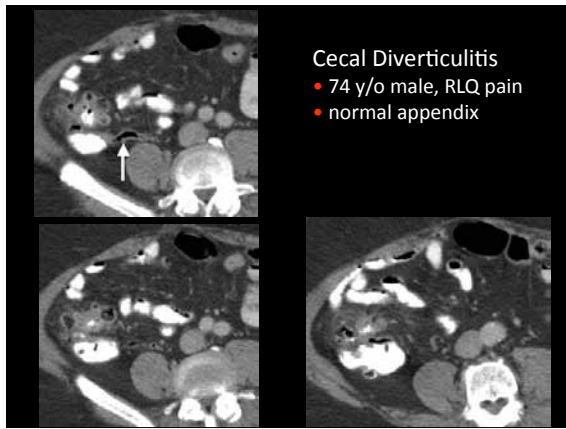
- Cecal tumor
- Appendiceal tumor
- Mucocele of appendix
- (Some cases of appendicitis)



Differential Diagnosis

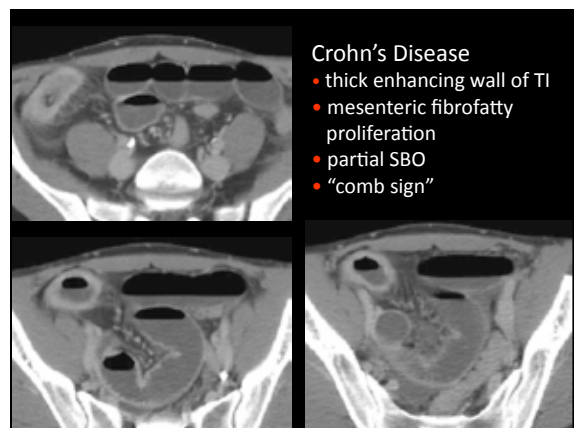
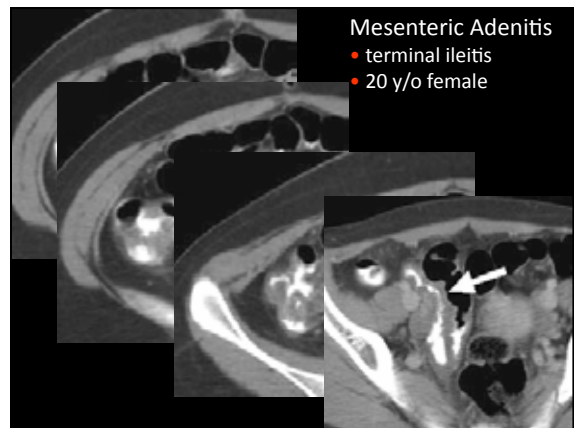
- | | |
|--|--|
| <ul style="list-style-type: none"> • Mesenteric adenitis • Cecal diverticulitis (or apex of sigmoid) • Crohn's or infectious ileitis • Typhlitis • Colitis • Meckel's diverticulitis • Omental infarction | <ul style="list-style-type: none"> • Pelvic inflammatory disease <ul style="list-style-type: none"> • Most common alternative Dx in young women • Foreign body perforation <ul style="list-style-type: none"> • Often at ileocecal • Neoplasm <ul style="list-style-type: none"> • Cancer or lymphoma |
|--|--|





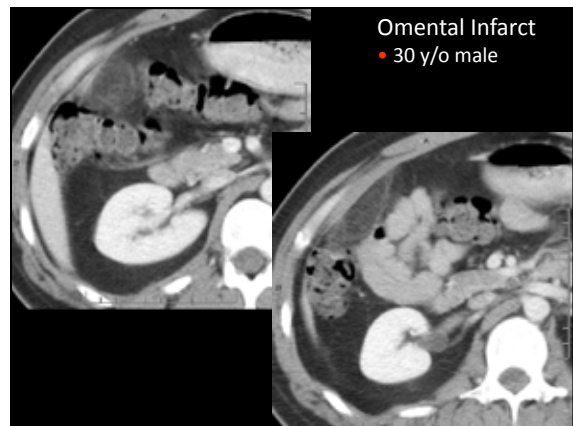
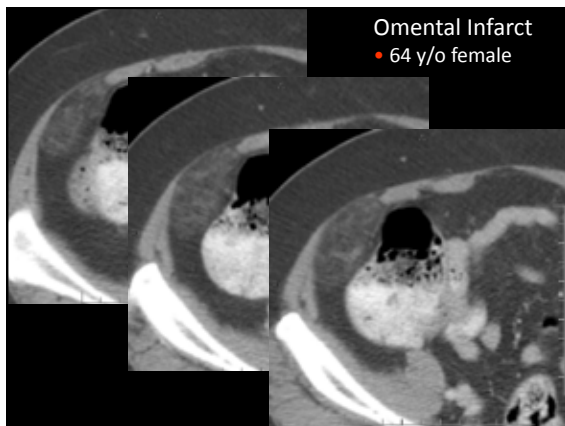
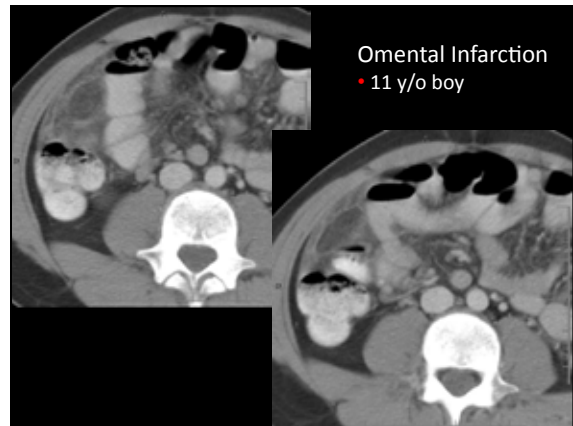
Mesenteric Adenitis

- Fairly common in children, young adults
- Clinically simulates appendicitis
- Caused by infection (Yersinia, virus, etc)
- CT – thick wall T. ileum, cecum (sometimes)
 - Enlarged (> 5mm) mesenteric nodes
 - Normal appendix



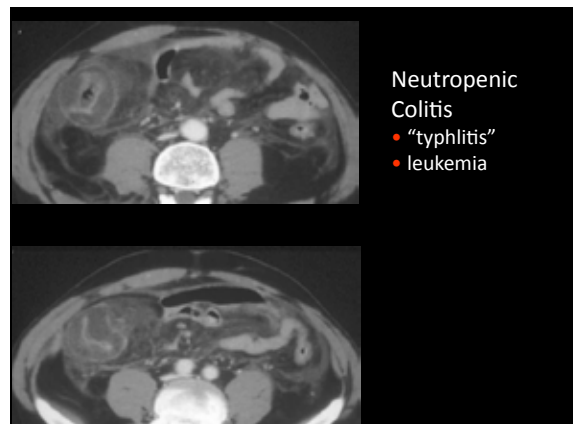
Omental Infarction

- Not a rare diagnosis
- Primary form is almost always near ascending colon
- Secondary form can occur anywhere (near site of prior surgery or inflammation)
- Looks like a ball of “dirty fat”, 3 to 8 cm diameter
 - Sometimes see swirl of twisted vessels
- Don’t operate! Resolves spontaneously



Typhlitis – Neutropenic Colitis

- In severely neutropenic patients
 - Leukemia, bone marrow transplant
 - Multimicrobial infiltration of bowel wall
- Massive thickening of wall of ascending colon
- Can perforate
 - Extraluminal fluid + gas = surgery



Gynecologic Causes of Acute Pain

- Pelvic Inflammatory Disease (PID)
 - Simple salpingitis to tubo-ovarian abscess
- Ovary
 - Torsion (often of a mass)
 - Hemorrhagic cyst
 - Endometriosis
- Uterus
 - Fibroids (necrosis, prolapse, bleed)

Tubo-ovarian Abscess



- Complex cystic mass
- Extensive infiltration (loss of fat planes)
- May need reformatted images to recognize serpiginous pyosalpinx



- 15 y/o female
- abdominal/pelvic pain
 - fever, diarrhea

Use all clues available!

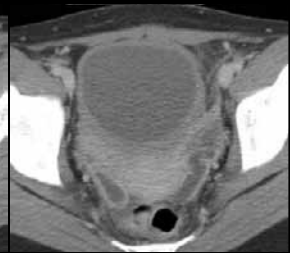


- 15 y/o female
- abdominal/pelvic pain
 - fever, diarrhea

PID

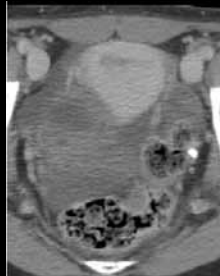
- evolving into pyosalpinges

• 10 months later



Torsed Ovary

- 18 y/o female
- hemorrhagic mass
- blood in cul-de-sac



Summary

- Appendicitis usually Dx accurately by clinicians in young men
- Dx often wrong in other groups
- Sonography good 1st step, accurate when positive
- CT often necessary and cost-effective in other groups + when US is nondiagnostic
- Gynecologic + inflammatory bowel disease most common alternate diagnoses