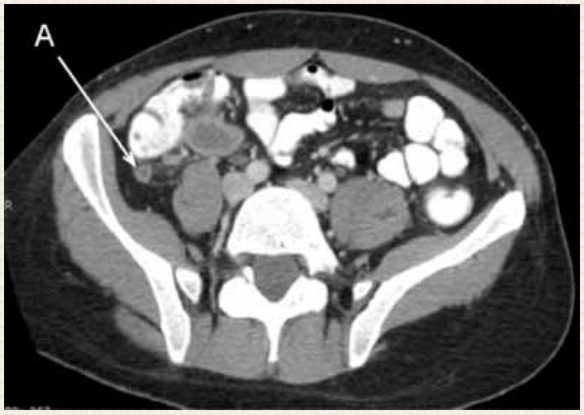
EMERGENCY MEDICINE CASES



EPISODE 43: ADULT APPENDICITIS CONTROVERSIES WITH DR. STEINHART & DR. DUSHENSKI

Appendicitis

Clinical Decision Scores:

1) ***ALVARADO score***: (**MANTRELS**)
   Migration of pain RLQ (1)
   Anorexia (1)
   N/V (1)
   Tenderness in RLQ (2)
   Rebound pain (1)
   Elevated temp >= 37.3 (1)
   Leukocytosis >=10 (2)
   Shift of WBC to left (1)

   Score of 7 or more has positive LR of 4.0. Score of less than 7 has negative LR of 0.2.

   Alvarado score NOT recommended by our experts as it underperforms in elderly, children and women, and physician judgment may outperform the score.

2) ***Appendicitis Inflammatory Response Score***
   Vomiting (1)
   Pain right inferior fossa (1)
   Rebound tenderness (1-3)
   Temp >=38.5 (1)
   PMN (1-2)
   WBC (1-2) CRP (1-2)

   Score 0-4 is low probability of appendicitis, 9-12 high probability.

Laboratory Values:

- WBC > 10: (Pos Likelihood Ratio (+LR)) = 2.4; Neg LR = 0.25) as good or better than any single clinical history/physical factor(2)
- Sensitivity of WBC increases with duration of illness
- Combining WBC and CRP increases predictive power
- Urinalysis – in appendicitis, inflamed appendix can abut the ureter and cause ureter inflammation, resulting in a significant WBC (don't assume UTI!)

History and Physical Examination

- Migration of pain, RLQ pain, psoas sign, fever, pain before vomiting, rebound tenderness all increase likelihood of appendicitis
- Recurrent pain decreases the likelihood of appendicitis but does not rule it out
- Pain while traveling over speed bumps increases the likelihood of appendicitis (3)
- DRE has limited role in diagnosis of acute, undifferentiated abdominal pain (4)
- Important to consider pelvic exam in females with undifferentiated abdominal pain. Remember, cervical motion tenderness does not rule out appendicitis!
- Atypical presentations: obese, immunocompromised, extremes of age, diabetics

Does Delay in Dx Increase the Rate of Appendix Perforation?

- Delay in seeking care is a risk factor for perforation
- Multiple studies have shown that in-hospital delay to OR <12 h does not affect perforation rates (5,6).

Imaging for Appendicitis

Factors Affecting Imaging:

1. Duration of Pain:
- Ultrasound sensitivity increases with duration of pain
- CT sensitivity unchanged with duration of pain

2. Body Habitus:
- Ultrasound accuracy is increased in slim patients
- CT accuracy is increased in obese patients

3. Number of ultrasounds done at your institution for appendicitis

Modalities:

Ultrasound:
- First line in: young, non-obese patients with symptoms > 12h
- Dependent on operator skill. More impact of patient's body habitus. Bowel gas can hinder image acquisition
- Diagnostic Criteria:
  - Non-compressible appendix
  - No peristalsis
  - Diameter > 6mm
- Other suggestive findings:
  - Appendicolith
  - Hyperechoic fat
  - Free fluid in males
- Appendix not visualized (7):
  - Indicator for observation vs. further imaging
  - NPV 85-95%
  - Consider your pre-test probability and other ultrasound findings

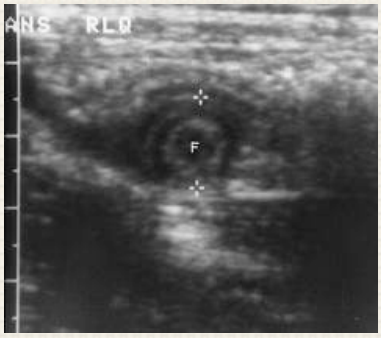


Fig 1: Distended appendix on Ultrasound

One option after equivocal ultrasound for appendicitis: observe patient for 8hrs, then re-examine +/- re-ultrasound (remember that ultrasound sensitivity increases with time)

CT Scan:
- Contrast may increase sensitivity (8)
- IV contrast: accentuates periappendiceal and luminal inflammation
- Oral contrast: demarcates appendix from surrounding structures, opacifies ileocecal portion of bowel in 45-60min
- Rectal contrast: also helps demarcate appendix, can administer just prior to CT, thereby reducing time to wait for CT (9).
- Studies have failed to demonstrate reduction in negative appendectomy rate in men despite increased CT use

Treatment

Antibiotics:
- No good evidence for routine administration of antibotics in ED for appendicitis
- Patients should receive prophylactic antibitoics within 60min window prior to incision
- Consider antibiotics if there is delay to OR

Medical vs Surgical Management:
- Oral antibiotics vs. immediate OR for acute, uncomplicated appendicitis (10). Amox-Clav found to be non-inferior to emergency appendectomy. However, associated with increased risk for recurrent disease.
- Candidates for medical management (decision best made in conjunction with surgical colleagues): Early, non-perforated, < 24h from onset of symptoms, no appendicolith or masses causing persistent obstruction of the appendix

References

(click for abstract)

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