Standardized Toolbox of Education for Pediatric Surgery

Appendicitis

APSA Committee of Education
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APPENDICITIS

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OBJECTIVES

• Understand the pathophysiology of appendicitis
• Learn elements in the history and physical examination pertinent to the diagnosis of appendicitis
• Understand the basic steps of the operation, including common risks of the procedure
• Learn the expected outcomes of the disease
APPENDICITIS

• Most common cause of acute surgical abdomen in children and adolescents
• Peak incidence between 10-12 years
• Increased rate of perforation in children
CASE STUDY

• 12 year old girl with 16 hr h/o abd pain
  – Initially diffuse discomfort, now RLQ
  – Nausea and vomiting
  – Normal BM yesterday

  – Sitting still, calm
  – 100.2 100 18 90/60
  – Abd--flat, RLQ tenderness, hypoactive BS
DIFFERENTIAL DIAGNOSIS

• Appendicitis
• Gastroenteritis
• Ovarian cyst, torsion
• Urinary tract infection
• Spontaneous bacterial peritonitis
HISTORY

Classic history is a diffuse/periumbilical pain, which eventually localizes to the right lower quadrant.

Pain followed by nausea/vomiting.

Anorexia may be associated.

Ask a child whether the “bumps on the road” on the ride over made the pain worse.

This usually signifies peritoneal irritation that can be seen with appendicitis.
PHYSICAL EXAM

• Tachycardia may be present.
• Fever
  – Acute appendicitis—low grade fever.
  – Ruptured appendicitis—often presents with higher Temperature.
• Tenderness in the right lower quadrant
• Rovsing’s sign—tenderness in the right lower quadrant elicited when pressure is exerted in the left lower quadrant.
APPENDICITIS: ACUTE VS. RUPTURED

- Duration of symptoms: 36 to 48 hours
- Fever grade: low vs high (38.5 ºC)
- Abdominal or rectal mass
- Localized vs diffuse peritonitis
ADJUNCTIVE TESTS

- WBC may be normal or elevated
- Elevated bands
- Urine dipstick excludes UTI

- CT or Ultrasound
  - if H & P is not confirmatory
  - if suspicious for rupture
Consent

• Discuss whether an open or laparoscopic approach is most applicable

• Risks
  – Infectious complications
  – Damage to adjacent structures—intestine, bladder, ureter, iliac vessels (trocar injury)
Preparation for Surgery

- **Intravenous fluids**
  - Tailor fluids to level of dehydration

- **Intravenous antibiotics**
  - Antibiotics should be administered as soon as the diagnosis of appendicitis is made (NOT to be considered “prophylaxis”)
  - Evidence to show single agent antibiotic therapy is effective even in ruptured appendicitis. (ref: APSA Systematic Review)
OPERATION: Open procedure

Right lower quadrant incision
Muscle sparing technique
Locate the appendix
Secure the mesoappendix
Amputate the appendix at the base
OPERATION: Laparoscopic procedure

- Contemporary approaches: Three port technique or SILS
- Abdomen is insufflated with carbon dioxide.
- Mesoappendix is secured with cautery, linear stapling device or Endoloops
- Base of appendix is secured with linear stapling device or Endoloops.
- Drainage of abscess if present
INTERVAL APPENDECTOMY

• When a patient presents with ruptured appendicitis associated with a localized abscess, he or she may benefit from percutaneous drainage of the abscess, IV antibiotics, and appendectomy in 6-8 weeks.
  – Operation performed when the acute inflammation has resolved may result in less physiologic insult to patient.
ACUTE APPENDICITIS: OUTCOME

• Average hospital stay of 1 day
• Risk of wound or pelvic infection—1-2%
• Rapid return to school and regular activity—1-2 weeks
RUPTURED APPENDICITIS: OUTCOME

- Longer hospital stay 5 days
- Need for antibiotics for 7 to 10 days
- Prolonged recovery 2-4 weeks
- More prone to complications
  - wound, intra-abdominal and pelvic infections (10-20%)
  - prolonged ileus
  - intestinal obstruction
  - Scarring of Fallopian tubes
COMPLICATIONS

• Peri-operative
  – Wound infection
    • Acute 1-5%
    • Ruptured 5-15%

• Long Term
  – Adhesive intestinal obstruction—higher in ruptured appendicitis
3 year old with 5 day history of abdominal pain and vomiting undergoes a laparoscopic appendectomy for ruptured appendicitis. The most appropriate immediate post-operative antibiotic therapy for this patient is:

a. IV ampicillin, gentamycin, metronidazole
b. IV piperacillin-tazobactam
c. oral trimethoprim-sulfamethosazole
Questions

3 year old with 5 day history of abdominal pain and vomiting undergoes a laparoscopic appendectomy for ruptured appendicitis. The most appropriate immediate post-operative antibiotic therapy for this patient is:

a. IV ampicillin, gentamycin, metronidazole
b. IV piperacillin-tazobactam
c. oral trimethoprim-sulfamethosazole
Question

• 12 year old male presents with a two day history of vague abdominal pain, now localized to the RLQ.
The preceding educational materials were made available through the American Pediatric Surgical Association.

In order to improve our educational materials we welcome your comments/suggestions at:

www.eapsa.org