Beyond Constipation: GI Emergencies in Children

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PEDIATRIC GI EMERGENCIES
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PEDIATRIC ABDOMINAL PAIN
How Common Is It?

- 5% of unscheduled visits
- 2% of patients are admitted
- 1% need operative intervention

EXAMINATION TIPS

- Palpate between cries
- Examine on parent
- Palpate with pt’s hand
- Head of stethoscope
- Parent examination
- Have pt jump/climb
CASE PRESENTATION

• A 10 day old female presents with bilious vomiting and abdominal distension. She is afebrile and has no ill contacts.
• HR 200, RR 70, O2 sat 99%
• What are your management priorities?
• What is the most likely diagnosis?

MALROTATION WITH MIDGUT VOLVULUS- What is it?

• Congenital malrotation of the midgut
• During 5th-8th embryonic week, intestine projects out of abdominal cavity, rotates 270 degrees and then returns
• If rotation is incomplete, the intestine does not anchor at the mesentery
• Volvulus is twisting of a loop of bowel about the mesenteric attachment

MALROTATION
Signs & Symptoms

• Usually presents in the first year of life
• Child looks sick => shock
• Bilious vomiting
• Abdominal distension may be present
• Hematochezia may develop
MALROTATION

Diagnosis

- **Abdominal films** - Classic double bubble sign
- **Upper GI** - Gold standard. “cork-screwing”, spiraling of the SI around the SMA
- **Ultrasound** - distended, fluid filled duodenum, with dilated loops of bowel to the right of the spinal column
MALROTATION

Treatment

• IV Hydration
• Correction of electrolytes
• NG tube
• Surgical correction

CASE PRESENTATION

• A 1-year old female presents with vomiting, intermittent abdominal cramping, and an episode of blood-streaked stool. She has been very lethargic today.
• You palpate a mass in the RUQ, and the patient has heme-positive stools

• What is the most likely diagnosis?

INTUSSUSCEPTION

What is it?

• Prolapse of one part of the intestine into the lumen of an immediately adjacent distal part
• Most common location: ileo-colic
• Mesentery and venous supply obstruct=> mucosal edema and increased pressure=> arterial flow obstruction
INTUSSUSCEPTION
What causes it?

- Idiopathic in children less than 2 years
- Meckel’s Diverticulum
- HSP
- Polyps
- Tumors Ex-lymphoma

INTUSSUSCEPTION
Diagnosis

- Abdominal films: may be normal initially, but then may see signs of obstruction, paucity of air and dilated loops of bowel
INTUSSUSCEPITION
Air versus Contrast Enema?

• PROS
  – Inert
  – Rapid
  – Less radiation
  – Air perforation better than contrast
  – Easier to administer

• CONS
  – May miss the lead point
  – Poorer visualization

CASE PRESENTATION

• A 2-week old presents with persistent crying for the previous 3 nights in the evening. The baby does not have a fever, there is no vomiting or diarrhea, and no ill contacts. The baby is consolable in the ED.
COLIC
What is it?
• Classically defined as unexplained paroxysmal crying for greater than 3 hours for more than 3 days a week for 3 weeks or longer in an otherwise healthy infant.

• It affects 10-30% of infants. Remember that it should be a diagnosis of exclusion!

COLIC
What should we tell the parents?
• Advise them to take a break for themselves!
• Try rocking the baby, going for a drive, be careful with the dryer trick!
• Consider formula changes-?nutramigen
• Reassure the parents that their child is not medically sick
CASE PRESENTATION
• A 6-week old male presents with non-bilious emesis after meals, there is no blood in the stools and he has no fever. He appears to be hungry at all times. The emesis has become projectile over the past few days.

• What is the most likely diagnosis?

PYLORIC STENOSIS
Overview
• Most common disorder requiring surgery in infancy
• Occurs in 1 /250 births
• M:F ratio=4:1
PYLORIC STENOSIS  
Pathophysiology

• Hypertrophy and hyperplasia of the pyloric musculature leading to obstruction
• Occurs after birth
• Unknown etiology

PYLORIC STENOSIS  
Signs & Symptoms

• Usually presents 2 weeks to 2 months after birth
• Most commonly presents as non-bilious vomiting, which may become projectile
• Patients may have a voracious appetite
• Constipation is common
• Jaundice may also be present

PYLORIC STENOSIS  
Physical Examination

• Dehydration “old man” appearance
• Peristaltic waves from left to right
• Palpable mass (olive) in RUQ, lateral to the right rectus muscle (70-90%)
PYLORIC STENOSIS
Diagnosis

- **UGI**: string sign, mushroom sign, shoulder sign
- **Ultrasound**
  - Pyloric wall thickness > 4mm (normal <2mm)
  - Canal length is >14mm (normal <10mm)
PYLORIC STENOSIS

Diagnosis
Mandell et al. Pediatrics, 1999

- 89 vomiting pts age 11-120 days
- NG tube placed after at least 1 NPO hour
- If NG aspirate greater than 5cc, US was performed. If negative then onto UGI
- If NG aspirate < 5cc, UGI performed first

PYLORIC STENOSIS

IMAGING APPROACH

- 23 / 89 had PS (25%)
- 66 / 89 had UGI- 79% had reflux
- Sensitivity of aspirate criteria = 91%; specificity of 88%.
- 6 false positives due to recent meal and 2 due to antral dysmotility
- If NPO for 3-4 hours, specificity increases to 94% and accuracy improves to 96%

PYLORIC STENOSIS

Treatment

- Electrolyte correction
- IV hydration
- Definitive surgery- widening of the pylorus via pylorotomy
CASE PRESENTATION

• A 6-year old male presents with diffuse abdominal pain, decreased appetite, fever, vomiting, and increased pain with motion. He has had 2 loose stools today.

• What diagnosis must you consider?

APPENDICITIS
Overview

• Most common etiology for surgical abdomen in children
• False positive rate of 15-20%
• Perforation rate 15-40% in younger children due to delays in diagnosis

Acute Appendicitis-Other Tests?
Gavela T. Peds EM Care 2012

• 111 consecutive pts admitted with a diagnosis of acute appendicitis between July 2009 and February 2010
• Age, sex, time since diagnosis, laboratory data, complications (abscess, intestinal obstruction), presence of hemodynamic instability, mortality, length of stay, and need for admission to the pediatric intensive care unit.
Acute Appendicitis-Other Tests?
Gavela T. Peds EM Care 2012

- Patients divided into 2 groups (group 1, appendicitis; group 2, localized or generalized peritonitis).

Acute Appendicitis- Other tests?

- CRP and PCT predict the outcome of pediatric patients with appendicitis.
- Children with CRP greater than 3 mg/dL and/or PCT greater than 0.18 ng/mL have a greater risk of complications.

Risk Factors For Perforation
Hung. Peds EM Care, 2012

- 228 patients < 17 years of age
- 140 had a postoperative pathological diagnosis of a nonperforated appendix,
- 88 had perforated appendix, resulting in a perforation rate of 38.6%.
Risk Factors For Perforation
Hung. Peds EM Care, 2012

- Younger age, longer duration of pain, fever, muscle guarding, and elevated CRP significantly associated with perforation

Scoring for Appendicitis
Bhatt AM. Acad Emerg Med 2009

- Convenience sample of children, 4-18 years old with abdominal pain of less than 3 days' duration
- Score components:
  - right lower quadrant and hop tenderness,
  - anorexia,
  - pyrexia,
  - emesis,
  - pain migration,
  - leukocytosis,
  - neutrophilia

- When a PAS of $\geq 8$ determined the need for appendectomy, the score's specificity was 95.1%
- Negative appendectomy rate would have been 8.8%, missed appendicitis rate would have been 2.4%, and 41% of imaging investigations would have been avoided.
Scoring for Appendicitis
Bhatt AM. Acad Emerg Med 2009

- Scores of \(<=4\) help rule out appendicitis, scores of \(>=8\) help predict appendicitis. Patients with a PAS of 5-7 may need further radiologic evaluation.

Imaging and Appendicitis
Ann Emerg Med 2012

- 1810 children, 3-18 years, mean 10.9 yrs
- 49% males
- 1216 had CT, 832 had US, 238 had both
- Sensitivity of US increased with duration of pain
  - 0.81 for <12 hours; 0.87 for 24-35 hours; 0.92 for 36-47 hours and 0.92 for 48-71 hours

Conclusions

- Sensitivity of US for appendicitis increases with longer duration of abdominal pain
- CT demonstrates high sensitivity regardless of pain duration
- CT scans are less likely to be equivocal with longer duration of pain
MRI Advantages

- No radiation
- Sedation due to rapid scanning depending on expertise
- Sensitivity 100%; Specificity 96% in AJR

A Practical Approach To Appendicitis

- RLQ pain and good history, WBC and CRP
  - + => OR
- +/- history and equivocal labs => Ultrasound
- US positive => OR
- US negative, but worrisome exam/history or labs => CT or MRI
- CT or MRI neg but pt still with pain => admission for observation!
CONSTIPATION

- The most common condition confused with appendicitis
- Rare in breast fed babies
- School aged children may develop it due to reluctance to use school toilets, diets high in carbohydrates and low in fiber

Gastroenteritis Quick Pearls

- Replace 10cc/kg of oral rehydration for diarrhea
- Replace 2cc/kg for emesis
- Ondansetron does not mask severe illness!
- Do not diagnose gastro if there is no diarrhea!

EXTRA-ABDOMINAL CAUSES OF ABDOMINAL PAIN

- Pneumonia
- Streptococcal pharyngitis
- UTI
- Sickle cell crisis
- Ingestion-consider iron!
- DKA
- GU- kidney stone, torsion!
SUMMARY

- Suspect intussusception in the afebrile, vomiting child without diarrhea
- Consider child abuse in vomiting patients
- Children may not present with classic findings of appendicitis
- Do not do rectal exam if you suspect Hirschsprung’s
- Bilious emesis is bad!