27ym with 3 months of progressive abdominal pain unrelated to meals
27ym with 3 months of progressive abdominal pain unrelated to meals
27ym with 3 months of progressive abdominal pain unrelated to meals

- MBA student, recent Chilean immigrant
- History of H.pylori gastritis
- Meds – Antacids, Iron
- Diagnosis – Ileocolic intussusception
- Treatment - Laparotomy with R hemicolecction
- No recurrence with 2 years follow up

BIDMC
85yf with abdominal pain and melena
85yf with abdominal pain and melena

BIDMC PACS
85yf with abdominal pain and melena
85yf with abdominal pain and melena
85yf with abdominal pain and melena

• Non-obstructing SB intussusception on SBFT
• Contrast flowed to cecum
• Surgical resection 4 days later
• Polypoid lesion and ulceration
• Discharged on postop day 7
22ym s/p MVA for r/o abdominal injury
22ym s/p MVA for r/o abdominal injury

- Report
  - Intussusception cannot be excluded
- No abdominal symptoms
- No treatment necessary
- Unrelated epidural bleed that required evacuation
48ym with vomiting and diarrhea for 10 days
48ym with vomiting and diarrhea for 10 days
48ym with vomiting and diarrhea for 10 days
48ym with vomiting and diarrhea for 10 days

SB follow through – contrast passing to colon
48ym with vomiting and diarrhea for 10 days

- Report
  - Intussusception suggested
- Pancreatitis by enzymes
- Medical management
- Negative SBFT
- Discharged on hospital day 4
Definition

- Invagination of a portion of intestine into itself
- Intussuscep-TUM invaginates into intussusc-I-p-IENS
- 95% ileocolic aka “idiopathic”

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Epidemiology

- 65% infants
- Gender ratio – 3:2 M/F
- Mortality 1-2%

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- Delay of appropriate treatment
  - Bowel ischemia
  - Perforation and peritonitis
  - Shock and death

Epidemiology

• Isolated case reports suggest a genetic susceptibility
• 4 family members over 3 generations
• One episode of idiopathic intussusception
• Two laparotomies – no anatomic abnormality
• No recurrences

Clinical Presentation

- Colicky abdominal pain – prevalence 100%
- Vomiting – 80-100%
- Currant-jelly stool – 65-95%
- Palpable mass – 16-56%

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Clinical Presentation

- Lethargy – 22%
- Diarrhea – 7%
- Prolapse through anus – 3%
- Fever
- Pallor

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Cause – Adults

• >90% lead point
  – Polyp
  – Meckel’s diverticulum
  – Lymphoma
  – Carcinoma
  – Surgical anastomosis

• Remaining
  – Changes in intestinal activity
Cause – Children

- Peyer patch hypertrophy 92-98%
- Lead point 2-8%
- Changes in intestinal activity – postoperative, enteritides, diet changes, allergic reactions

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Differential Diagnosis

- Adhesive band SBO
- Appendicitis
- Gastroenteritis

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Clinical Decision Making

- Classical quad only 7.5% of presentations
  - Vomiting
  - Abdominal pain
  - Abdominal mass
  - Rectal bleeding
- Ultrasound if clinical suspicion
- Attempt air enema reduction in all patients with positive u/s

Imaging

- Abdominal plain film
- Ultrasound
- CT
- Enema – diagnostic and therapeutic procedure
Abdominal Plain Film

• Can suggest diagnosis
  – Mass, often RUQ
  – Bowel obstruction pattern
  – Bowel distal to intussusception collapses, so in general right colon filled with stool or gas is evidence against intussusception

Abdominal Plain Film

- **Meniscus sign**
- **Three views of abdomen**
  - Only excluded intussusception in 25% of patients
- **More specific test is necessary**

Ultrasound

- Enema positive finding rate
  - 22% prior to advent of ultrasound
  - 58% in population of positive ultrasound and/or strong clinical suspicion
- Ultrasound has limited enema use to therapy, thereby reducing pediatric exposure to radiation

Ultrasound

- 98% sensitive
- Confirms presence or absence of lead points
- “Target” sign
- “Pseudo-kidney” sign
  - Not pathognomonic
  - Differential – Bowel wall thickening
    - Neoplasm
    - Edema
    - Hematoma

CT

- Operator-independent
- Fast
- Fixed frame of reference
- Correlate with clinical picture
- Exposes patient to high dose of radiation
- Consider cost-benefit ratio, especially in children
Enema

- Hydrostatic or Pneumatic Reduction
- Barium/water column 100-110cm high
- Max air pressure 120-140mm Hg (15-20% $P_{atm}$)

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Enema

- Can continue as long as progress is made
- Can drain bowel and repeat
- Blood flow in/out by Doppler
  - 90% reduction rate if flow present
  - 31% reduction rate if flow absent
  Kong et al. Factors related to detection of blood flow by color Doppler ultrasonography in intussusception. J Ultrasound Med 16:141-144
- No absence of blood flow by Doppler in intussusceptions – 300+ cases
Choice of Enemas

- Initially barium, then alternative choices of pneumatic and hydrostatic
- Barium 85% reduction rate
- Air 100%

Air Enema

• Advantages
  – Smaller bowel tears
  – Less contamination when tear occurs
  – Less fluoroscopic time and radiation
  – Easier to clean anal leak

• Disadvantage
  – Pseudomass – air in small bowel
  – Missed lead point, IBD, or hemorrhage

Ultrasound

- Reduction Guidance
- Hydrostatic Enema – ultrasound guided
- Similar reduction rates as air enema
- Convenience of ultrasound suite
- Avoidance of radiation
- Protocol – notify Pediatric Surgery of therapeutic reduction to be performed

Hydrostatic Reduction

- Success rate >90%
- Best if
  - R sided intussusception
  - No entrapped fluid
- Presence of peritoneal fluid is irrelevant
- Success rate drops to 46% if enlarged lymph nodes detected within intussusception
  Koumanidou C et al. Sonographic Detection of Lymph Nodes in the Intussusception of Infants and Young Children. AJR 2002; 178: 445-450
Perforation

- Perforation rate with air enema is 1%
- Tension pneumoperitoneum may result.
- Treatment – prompt needle decompression.

Ng E et al. Life threatening tension pneumoperitoneum from intestinal perforation during air reduction of intussusception. Paediatr Anaesth. 2002 Nov; 12(9): 798-800
Imaging

- Transverse – “Target” sign
- Transverse – “Crescent-in-doughnut” sign
- Transitional – “Pseudokidney”
- Longitudinal – “Telescope” sign
- Plain Film – “Meniscus” sign
- BE – “Coiled spring” sign
Target sign and Crescent-in-Doughnut sign
Pseudokidney sign
Telescope sign
Meniscus sign
Coiled Spring sign
Self-Limiting Cases in Adults

- Shorter involved segment – significant difference at length 3.5 cm
- Young age
- Lack of GI symptoms, i.e. incidental finding
- Lack of infiltration, edema, or ascites
- Lesser mean diameter of involved segment

Laparotomy

- RLQ incision by odds
- Gentle push instead of pulling
- Excise and anastomose if unsuccessful
- Enterotomy and resection if suspect lead point
- Incidental appy

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Recurrence

- Enema Reduction 5-13%
- Surgical 3%

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- Usually lead point
- Isolated lymphoid hypertrophy treated with steroids
- No recurrence

Surgical Complications

- Perforation
- Adhesion
- Infection
- Ischemic bowel
- Incisional hernia

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Lessons from Developing Countries

• Nigerian pediatric series
• 67% of surgical patients – Gangrenous bowel => Hemicolecotomy
• Mortality 40%
• Early presentation carries better prognosis
• Availability of non-surgical alternative a must

• Double intussusception – overlapping telescoping segments
• Three cases reported – surgically reduced

**Transient Intussusception**

- Retrospective review of positive CT findings in pediatric age
- Ileocolic and GJ tube intussusceptions EXCLUDED
- No patient had persistent intussusception requiring surgery
  - 40% resolved on f/u CT
  - Clinical correlation lacking or questionable in 80%

References

- BIDMC PACS and CCC
- Merck Manual, Handheld Edition
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- Koumanidou C et al. Sonographic Detection of Lymph Nodes in the Intussusception of Infants and Young Children. AJR 2002; 178: 445-450
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