Gastro-intestinal emergency in children

M. Mearadji
International Foundation for Pediatric Imaging Aid
Introduction

- Acute abdominal pain is a common health problem in children.
- Around 10% of children in school age have recurrent abdominal pain, only in 10% of these patients an etiology can be detected.
- Clinical diagnosis is usually based on accurate history, physical and laboratory findings.
- In addition to a painful abdomen, vomiting, abdominal distention, fever, diarrhoea with or without bloody stool or constipation should be taken into account.
- Diagnostic imaging usually starts with an abdominal film or ultrasound.
- CT, MRI, gastrointestinal series and other modalities are all valuable in specific circumstances.
Different causes of gastro intestinal diseases in children

**Surgical cases:**
1. Appendicitis
2. Intestinal obstruction
   A. Adhesion
   B. Volvulus and malrotation
   C. Incarcerated inguinal hernia
3. Perforation
4. Intussusception
5. Trauma
6. Enteric duplication cysts
7. Meckel’s diverticulum
8. Gastro-intestinal tumors

**Non surgical cases:**
1. Constipation
2. Gastro enteritis
3. Mesenteric lymphadenitis
4. IBD
   A. Crohn disease
   B. Colitis ulcerosa
5. Ileocoecitis
6. Peptic ulcer
7. Peritonitis
8. Typhlitis
9. Hemolytic uremic syndrome
10. Henoch-Schönlein pupura

Specific GI tract disorders in neonatal age are excluded from this context.
Appendicits

Clinical signs:
- Abdominal pain (RLQ)
- Nausea and vomiting
- Constipation
- Diarrhoea
- Fever
- Abdominal distention
- Anorexia

Imaging priority
- Abdominal plain film
- US
- CT
- MRI
Not perforated appendicitis

Perforated appendicitis
2 cases of perforated appendicitis.
Adhesive intestinal obstruction

**Clinical presentation**
- Abdominal pain and cramping
- Vomiting
- Abdominal distention
- Abdominal fullness gaseous
- Diarrhoea or constipation
- Breath odor

**Imaging priority**
- Abdominal plain film
- US
- CT
- GI-series
Volvulus and malrotation

Clinical presentation
- Vomiting bile
- Abdominal pain
- Abdominal distention
- Rapid heart rate
- Rapid breathing
- Shock
- Bloody stool

Imaging priority
- Abdominal plain film
- US
- GI series
Incarcerated inguinal hernia

Clinical presentation
- Abdominal pain
- Vomiting
- Swelling or a bulge in going
- Abdominal distention
- Anorexia

Imaging priority
- Abdominal plain film
- US
- GI-series
Gastrointestinal perforation

Clinical presentation
- Abdominal pain
- Tenderness to palpation
- Distention
- Fever
- Tachycardia

Imaging priority
- Abdominal plain film
- US
**Intussusception**

**Clinical presentation**
- Intense intermittent abdominal pain
- Abdominal distention
- Vomiting
- Jelly stool
- Diarrhoea
- Complication fever
- Dehydration

**Imaging priorities:**
- Abdominal plain film
- US
- Enema
- CT
Burkitt lymphoma as leadings point for ileochoecal intussusception
Intestinal injuries

Clinical presentation
- Abdominal pain
- Abdominal distention
- Vomiting
- Anemia
- Infections

Imaging priority
- Abdominal plain film
- CT
- GI series
Enteric duplication cysts

Clinical presentation depends on presence and type of complication:
- Obstruction
- Intussusception
- Volvulus
- Ulceration
- Perforation

Imaging priority:
- Plain film
- US
- GI series or barium enema
- MRI
Meckel’s diverticulum

In majority of cases asymptomatic. The following symptoms are expected in complicated cases as sings:

- Painless rectal bleeding
- Abdominal pain by obstruction, volvulus or intussusception
- Infection with similar signs as appendicitis
- Perforation

Imaging priority:

- Abdominal plain film
- Nuclear scanning
- US
- GI series
Intra peritoneal tumors

(Gastro Intestinal Stromal Tumor (GIST), hamartoma, Burkitt)

General clinic presentation
- Abdominal distention
- Vomiting
- GI bleeding
- Anaemia
- Abdominal pain

Imaging priority
- US
- CT
- MRI
Constipation

Clinical presentation
- Infrequent defecation
- Abdominal distention
- Abdominal pain
- Vomiting
- Paradoxe diarrhoea

Imaging priority
- Abdominal plain film
- Barium enema
- Colonoscopy
Gastro-enteritis

Clinical presentation
- Diarrhoea
- Vomiting
- Fever
- Abdominal pain and cramping
- Dehydration

Imaging priority
- Abdominal plain film
- US
- CT
Ultrasound by gastro-enteritis.
Mesenteric lymphadenitis

Clinical presentation
- Nausea and vomiting
- Abdominal pain (RLQ)
- Fever
- Diarrhoea
- Anorexia

Imaging priority
- US
IBD Ulcerative colitis

Clinical presentation
- Constant diarrhoea with blood
- Abdominal cramping and pain
- Dehydration
- Fever
- Weight loss
- Dizziness
- Anorexia
- Fatigue
- Skin lesion
- Growth failure

Imaging priority
- Colonoscopy
- US
- Abdominal plain film
- MR entrocolysis
Sonographic finding and barium enemaby colitis ulcerosa
IBD Crohn disease

Clinical presentation
- Abdominal pain
- Diarrhoea
- Frequent bowel movement
- Fatigue
- Malabsorption
- Unrelated to the GI tract
  - Iritis
  - Joint pain
  - Skin lesion
  - Aptheus ulcer
  - Growth failure
  - Abscess

Imaging priority
- Endoscopy
- US
- MR enteroclyse
- GI series
- CT
Ileocoecitis

Clinical presentation
- Abdominal pain (RLQ)
- Intermittent colicy
- Mild diarrhoea

Imaging priority
- US
Peptic ulcer

Clinical presentation
- Burning pain in upper abdomen
- Nausea
- Vomiting
- Chest pain
- Loss of appetite
- Frequent burping and hiccupping
- Weight loss
- Feeding difficulties
- Blood in vomit or stool

Imaging priority
- Endoscopy
- GI series
Peritonitis

Clinical presentation
- Variable symptoms
- Pain
- Abdominal distention
- Fever (38)
- Chills
- Nausea
- Vomiting
- Anorexia
- Pale cold skin
- Low blood pressure
- Shock

Imaging priority
- Abdominal plain film
- US
Typhlitis

Signs and symptoms (M. Beth McGaville et al (2004))

- Abdominal pain: 91%
- Fever: 84%
- Abdominal tenderness: 82%
- Diarrhoea: 72%
- Emesis: 64%
- Nausea: 59%
- Constipation: 6%

Imaging priority

- Abdominal plain film
- US
GI hemolytic uremic syndrome from diarrhoea to dialyse

Clinical presentation
- Abdominal pain and cramping
- Vomiting
- Bloody watery diarrhoea
- Dehydration
- Weakness
- Anemia

Imaging priority
- US
- Barium enema
Henoch-Schönlein purpura

Clinical presentation
- Abdominal pain
- Joint pain
- Bloody stool
- Nausea and vomiting
- Diarrhoea

Imaging priority
- US
Conclusion

- Clinical evaluation of acute abdominal pain remains a challenge for the clinician
- Age is a key factor in evaluating the cause
- A detailed personal history, clinical examination and laboratory investigation is the hallmark to suspect a correct diagnosis
- The incidence and symptoms of different conditions vary greatly
- In acute surgical condition pain generally precedes vomiting
- Abdominal distention and tenderness and defecation are other clinical symptoms of acute abdomen
- Abdominal pain and vomiting is most frequent finding of acute abdominal disorders
Conclusion

- Primary imaging of abdominal emergencies in childhood is a radiograph of the abdomen.
- US contributes largely in an adequate diagnostic procedure of acute abdomen especially by intussusception and appendicitis.
- CT will be reserved for selected patient when further information is needed especially by abdominal trauma.
- MR is a second-line alternative modality for patients with a unclear diagnosis.
- MR enteroclyse is an useful technique in diagnosis of chronic diseases.
- GI tract series, isotop scanning are all additional modalities in specific cases.