



Gastro-intestinal emergency in children

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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, gastro intestinal 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. Ileocolitis
6. Peptic ulcer
7. Peritonitis
8. Typhlitis
9. Hemolytic uremic syndrome
10. Henoch-Schönlein purpura

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

Appendicitis

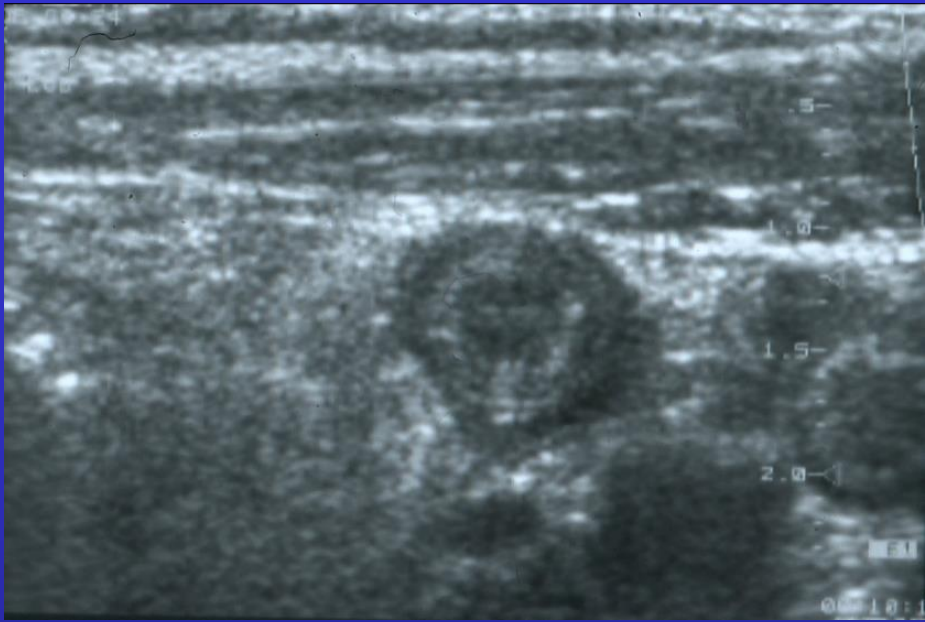
Clinical signs:

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

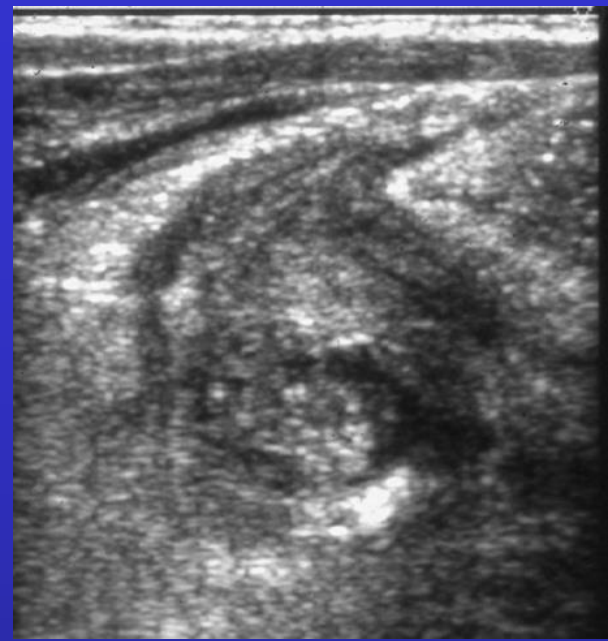
Imaging priority

- Abdominal plain film
- US
- CT
- MRI

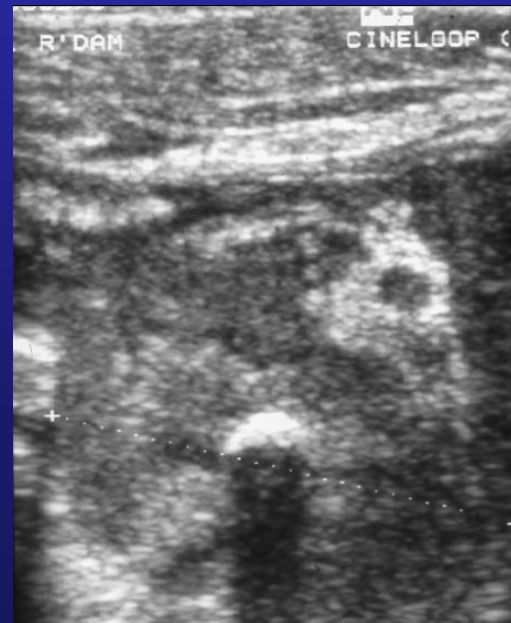
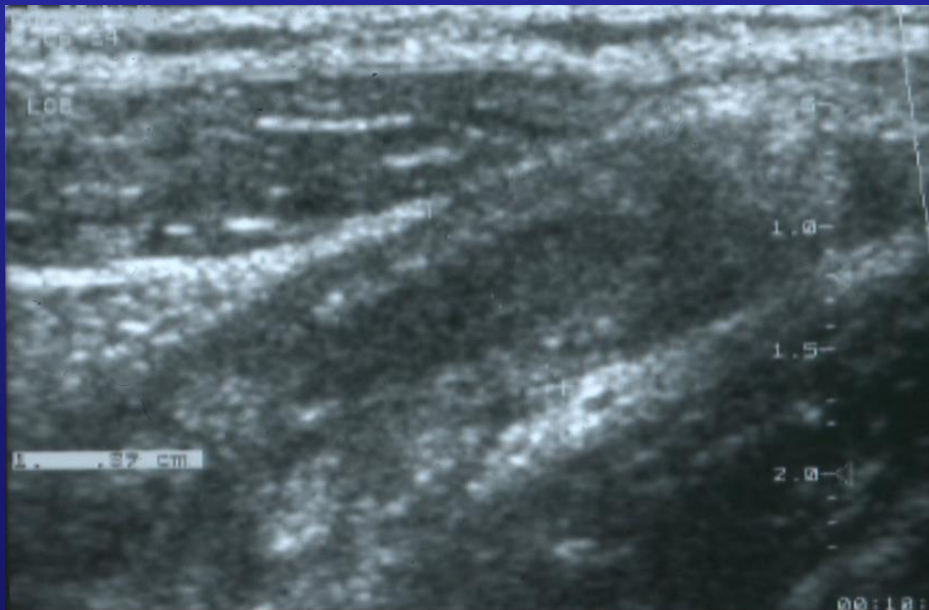


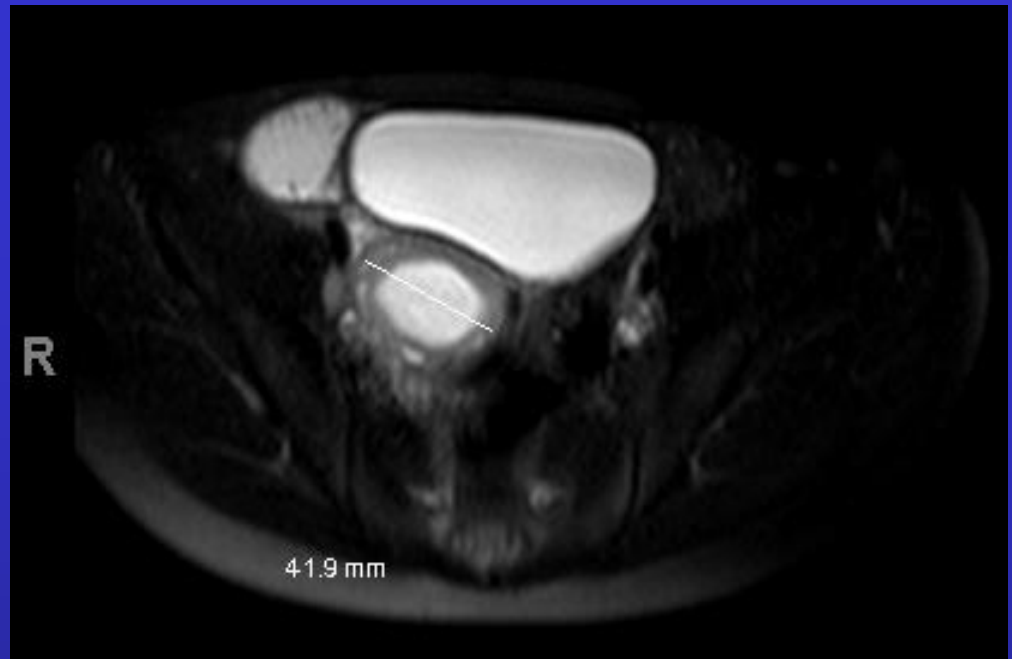
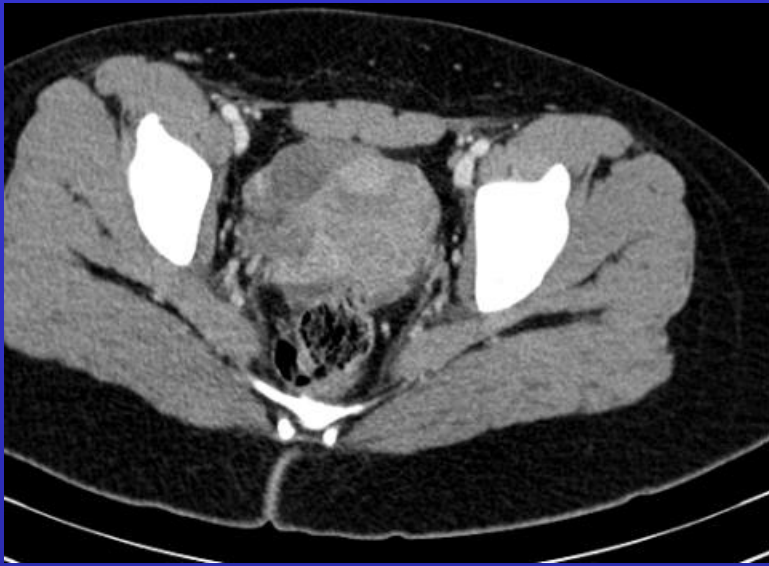


Not perforated appendicitis



Perforated appendicitis





2 cases of perforated appendicitis.



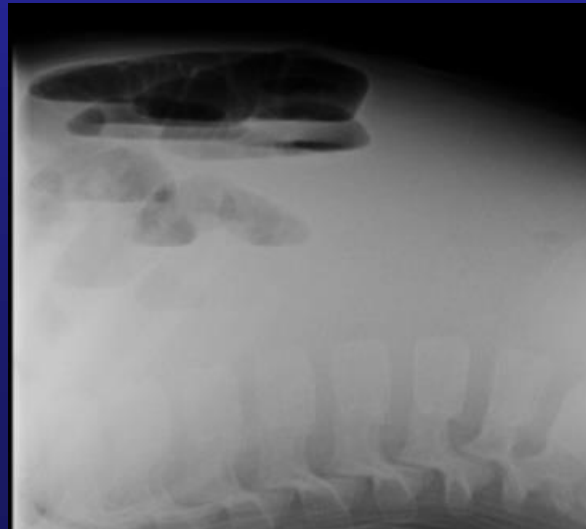
Adhesive intestinal obstruction

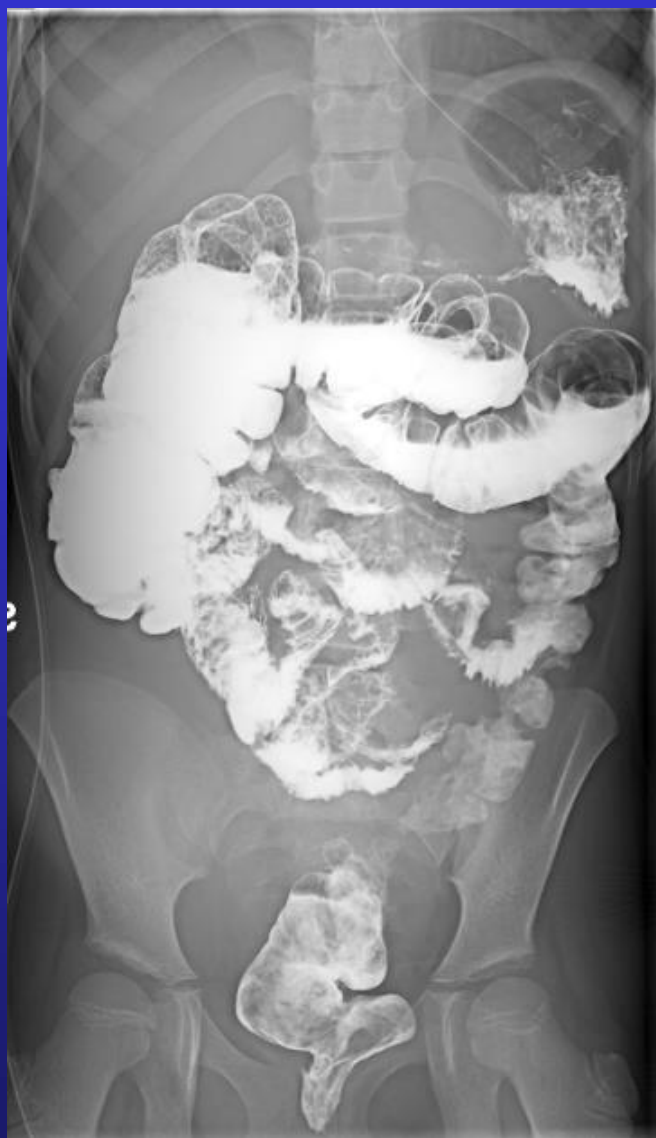
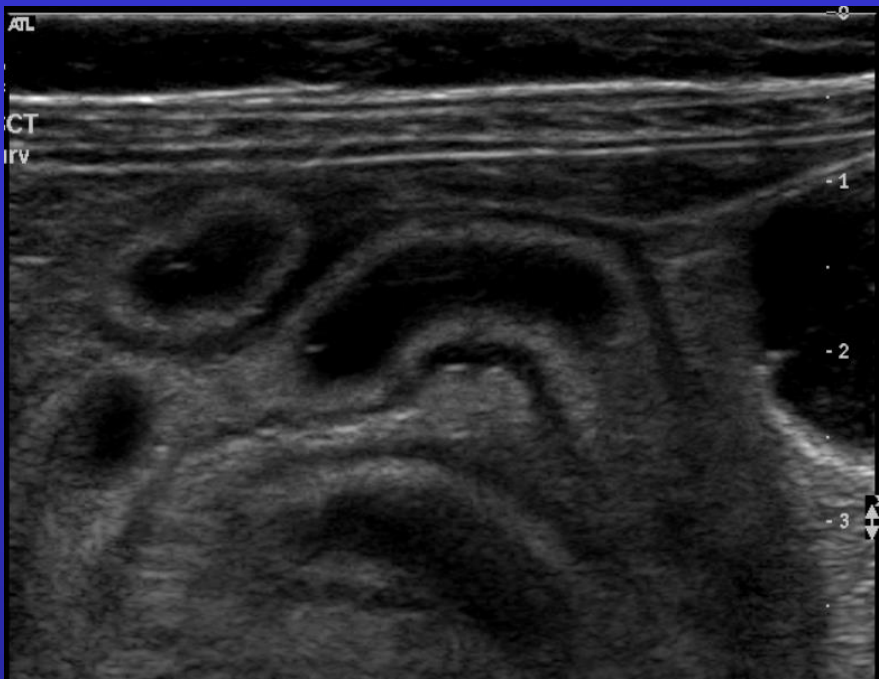
Clinical presentation

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

Imaging priority

- Abdominal plain film
- US
- CT
- GI-series





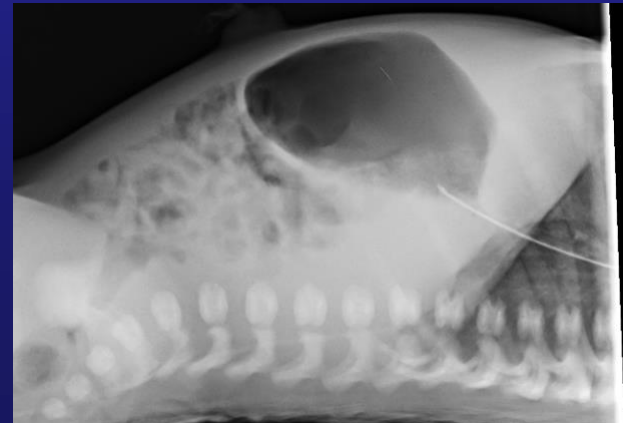
Volvulus and malrotation

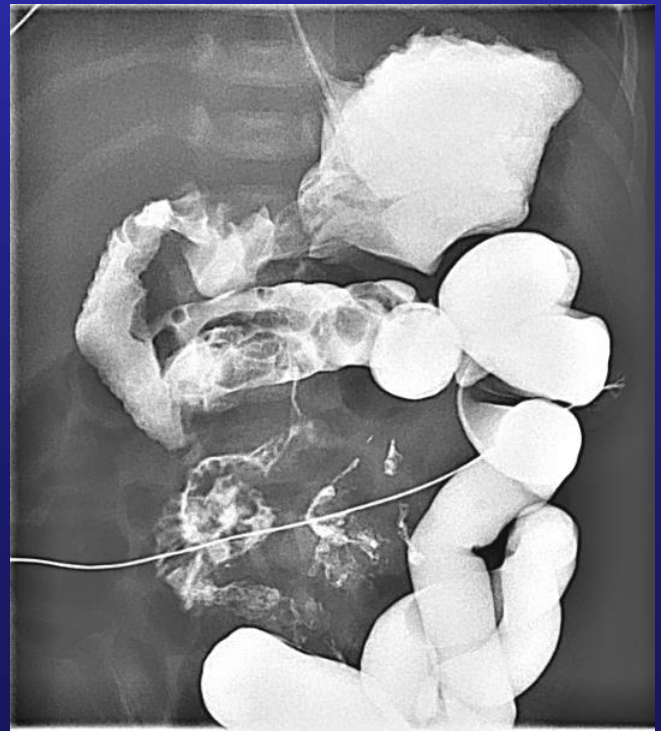
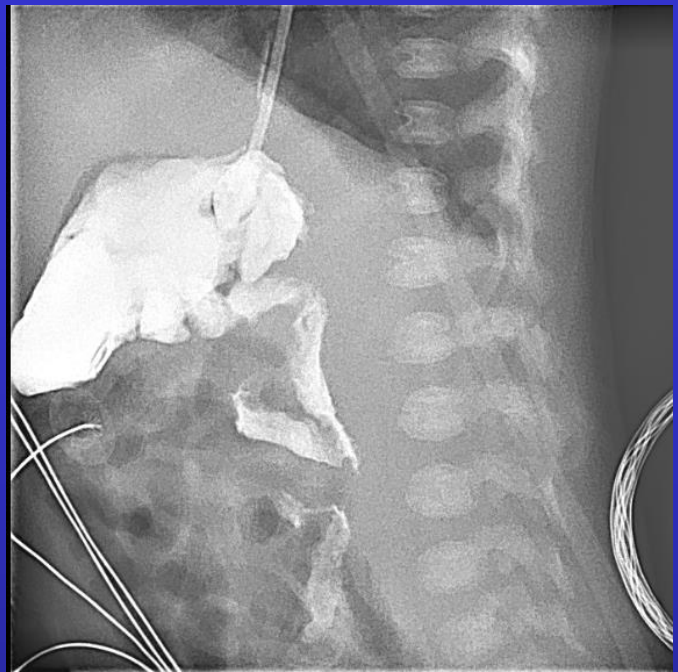
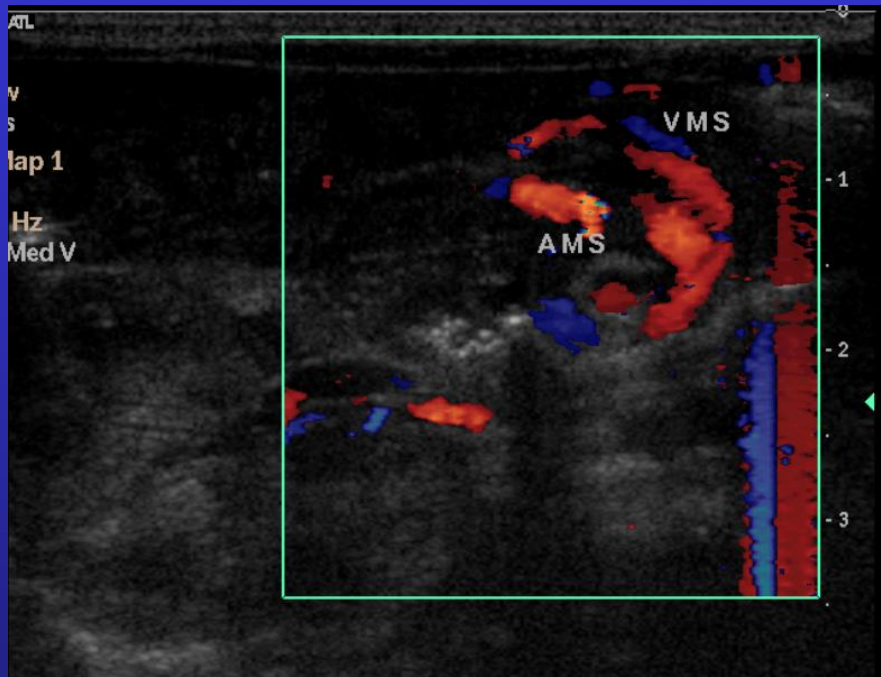
Clinical presentation

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

Imaging priority

- Abdominal plain film
- US
- GI series





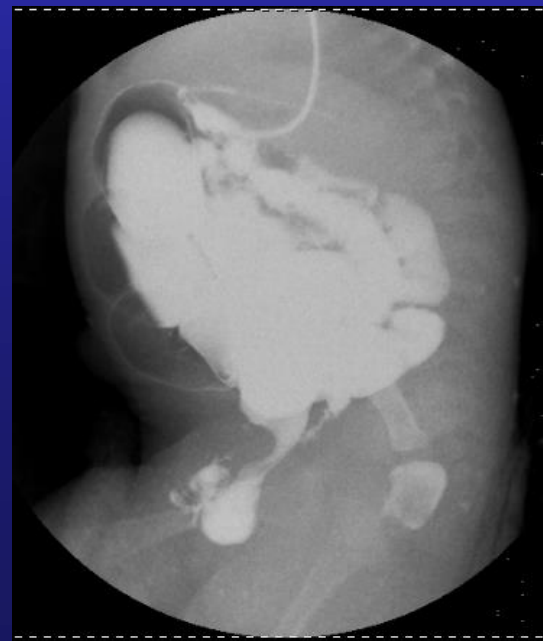
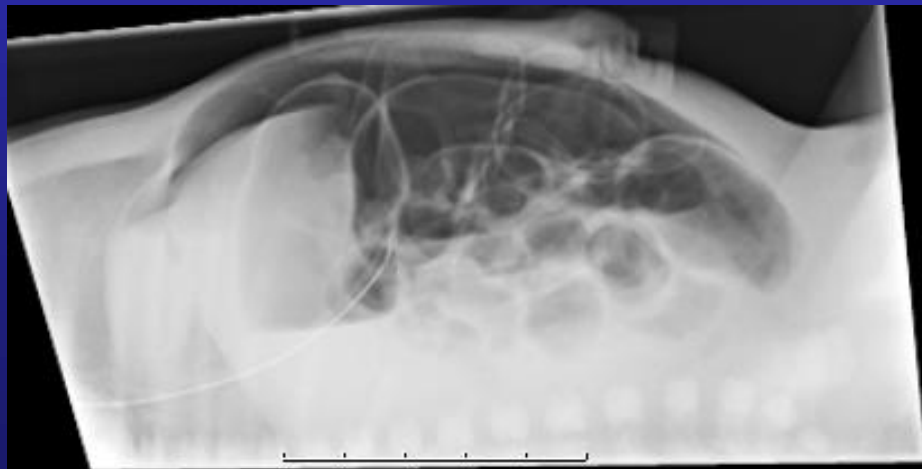
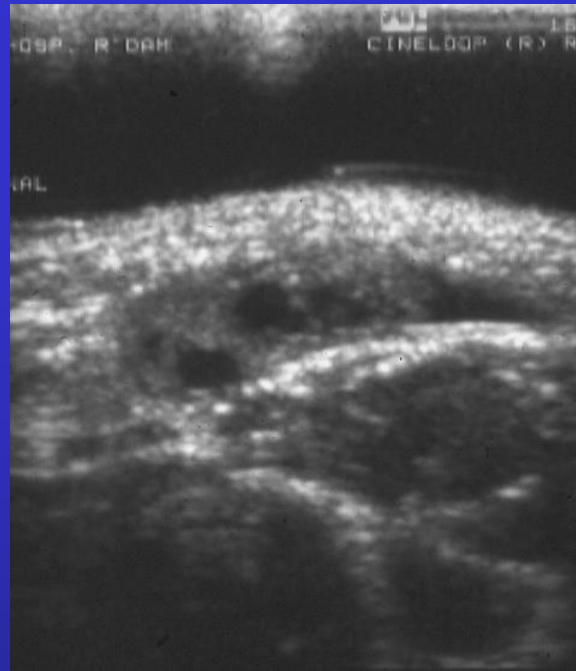
Incarcerated inguinal hernia

Clinical presentation

- Abdominal pain
- Vomiting
- Swelling or a bulge in groin
- Abdominal distention
- Anorexia

Imaging priority

- Abdominal plain film
- US
- GI-series



Gastro intestinal perforation

Clinical presentation

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

Imaging priority

- Abdominal plain film
- US



Intussusception

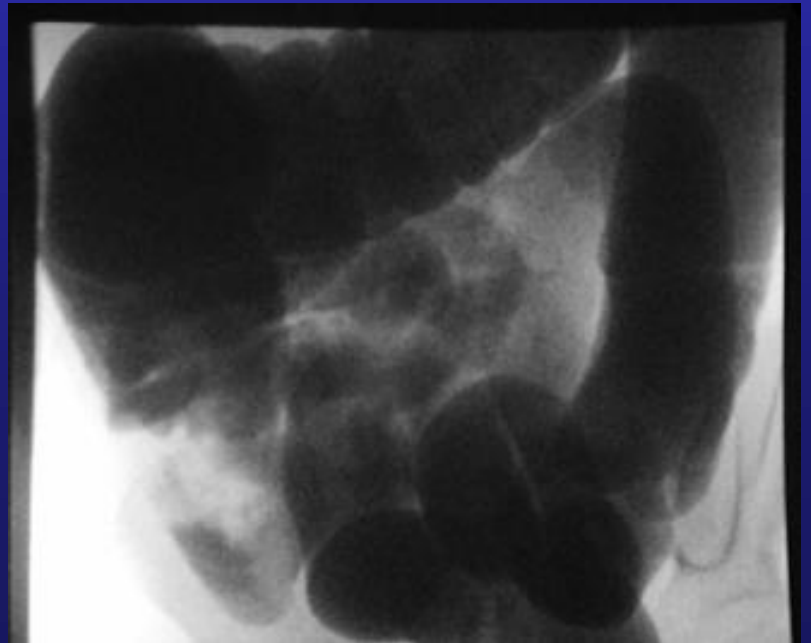
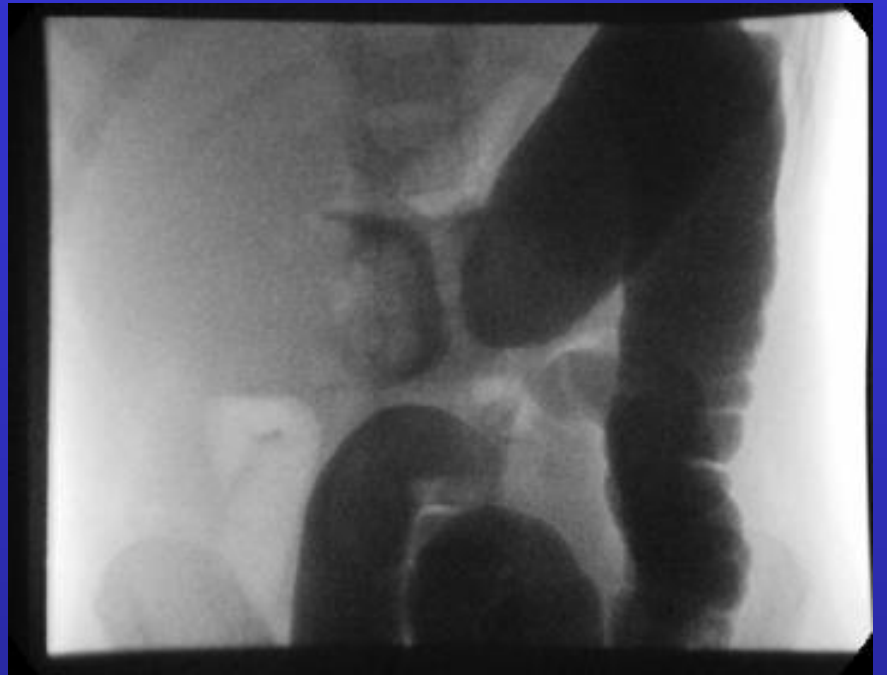
Clinical presentation

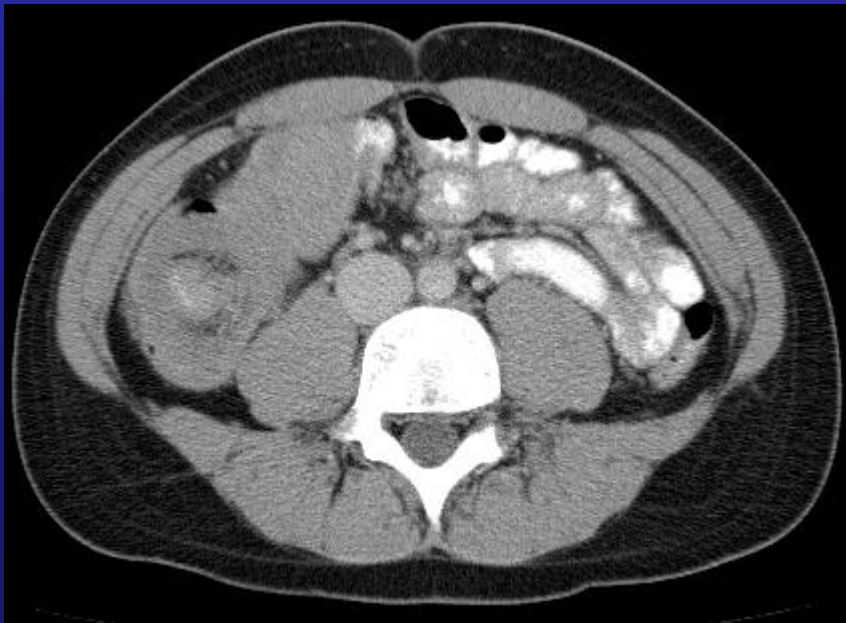
- Intense intermittent abdominal pain
- Abdominal distention
- Vomiting
- Jelly stool
- Diarrhoea
- Complication fever
- Dehydration

Imaging priorities:

- Abdominal plain film
- US
- Enema
- CT







Burkitt lymphoma as
leadings point for
ileocecal intussusception

Intestinal injuries

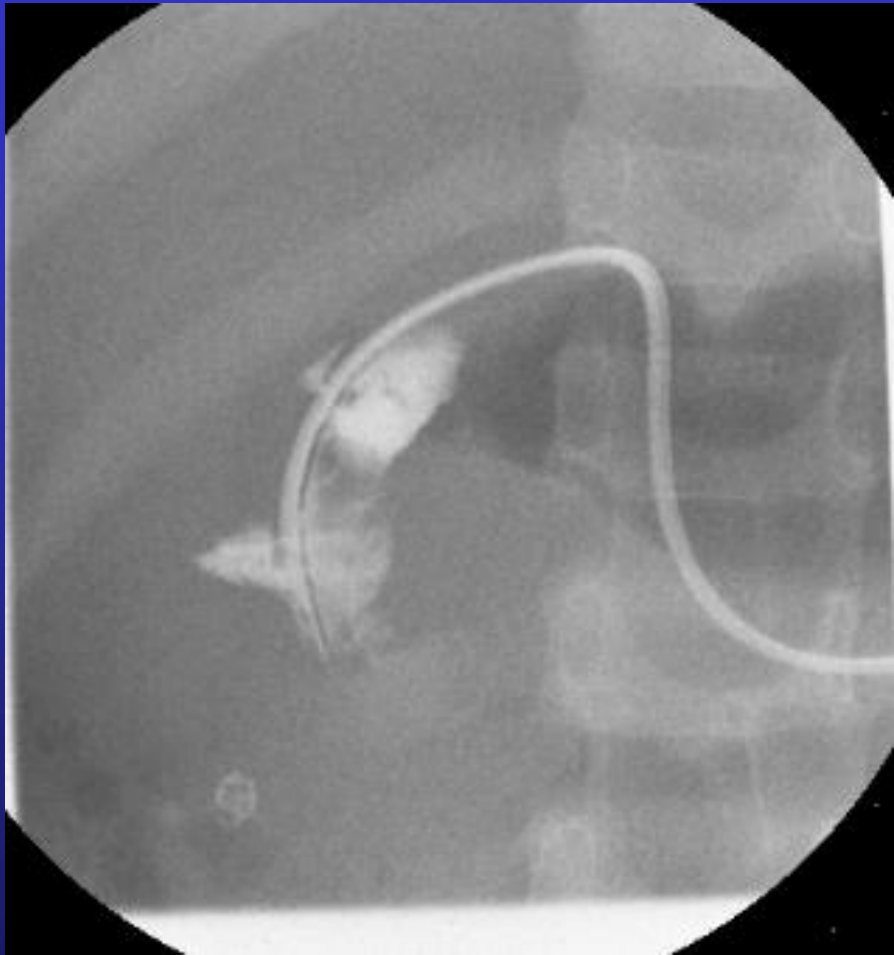
Clinical presentation

- Abdominal pain
- Abdominal distention
- Vomiting
- Anemia
- Infections

Imaging priority

- Abdominal plain film
- CT
- GI series





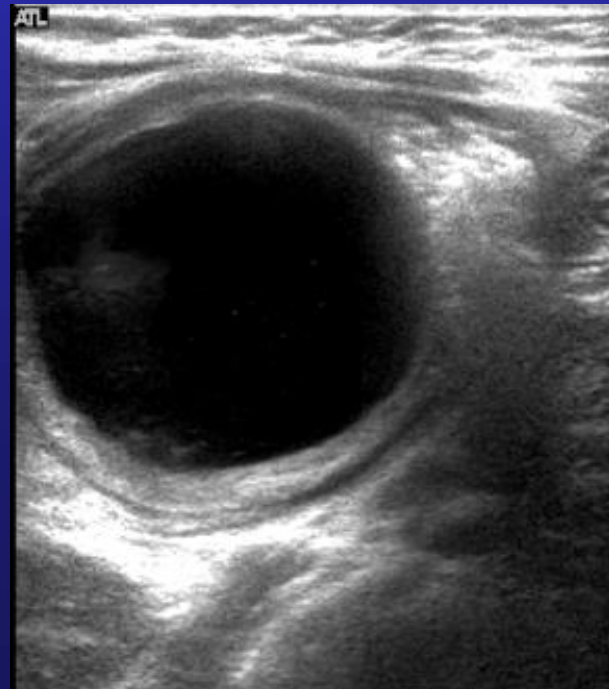
Enteric duplication cysts

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 signs

- 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

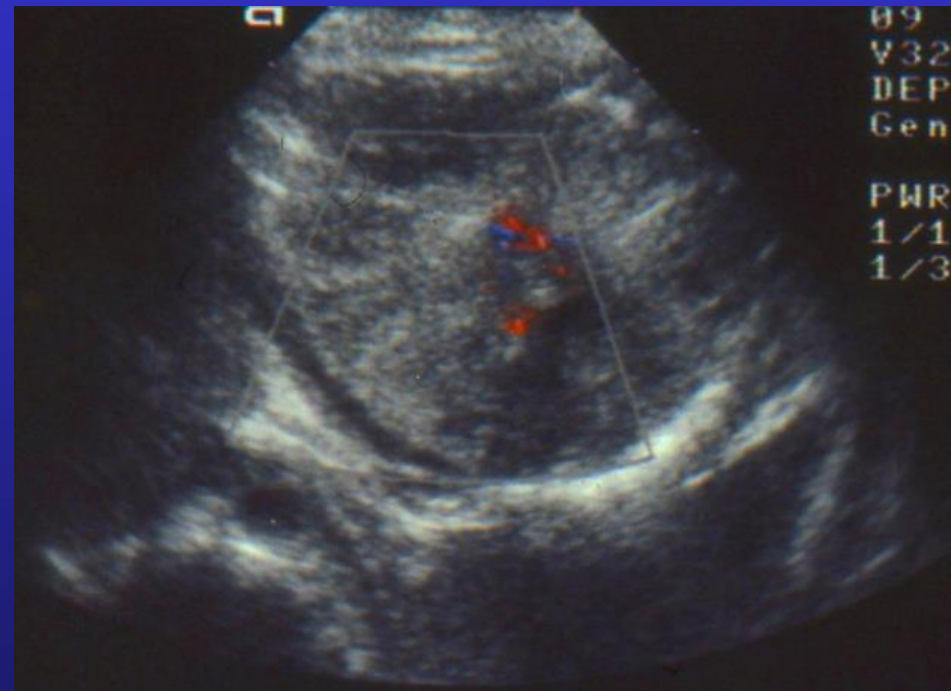
(Gastro Intestinal Stromal Tumor (GIST), hamartoma, Burkitt)

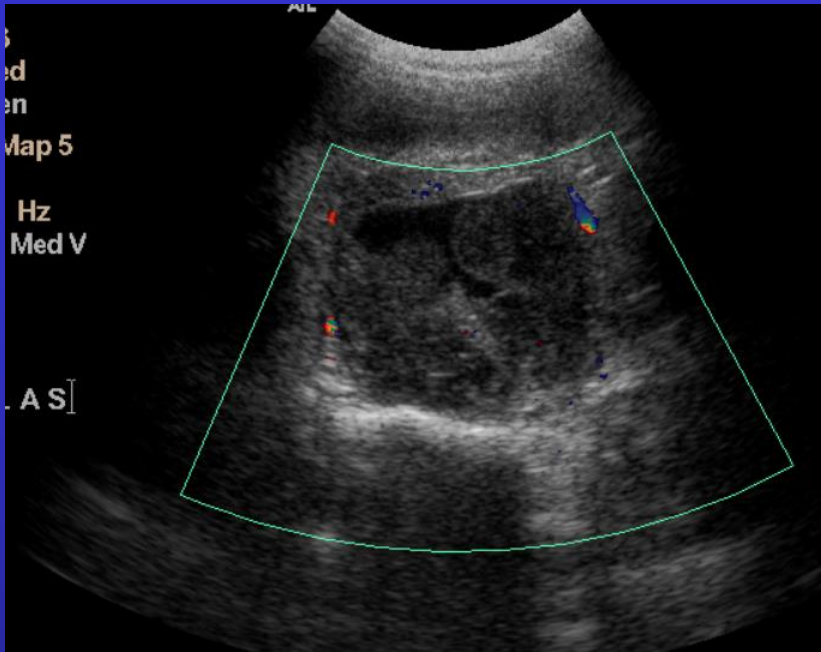
General clinic presentation

- 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



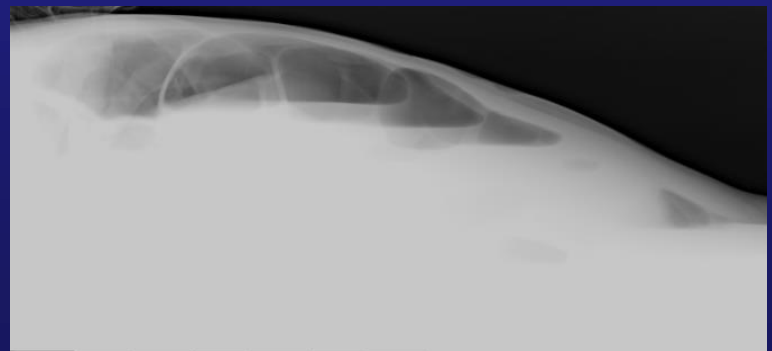
Gastro-enteritis

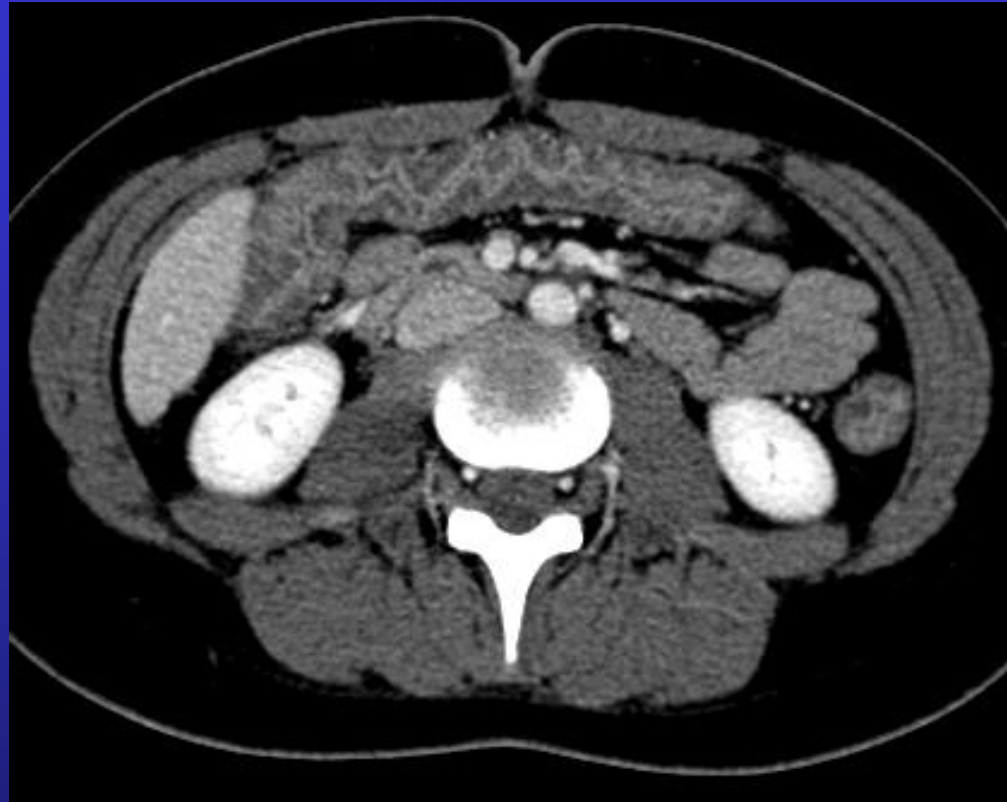
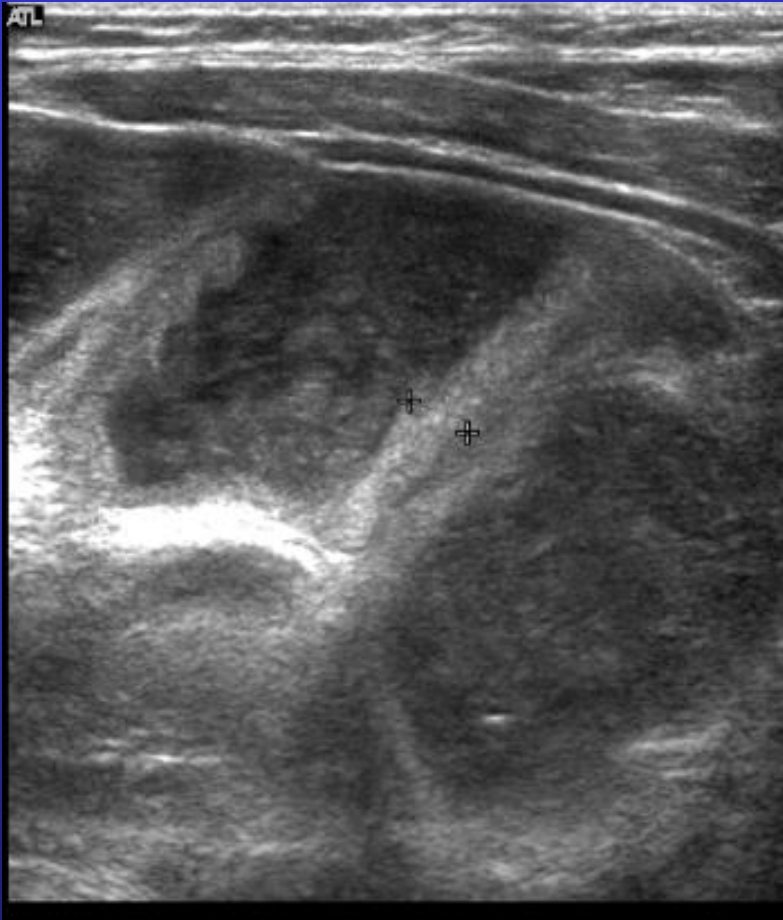
Clinical presentation

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

Imaging priority

- Abdominal plain film
- US
- CT





Ultrasound by gastro-enteritis.

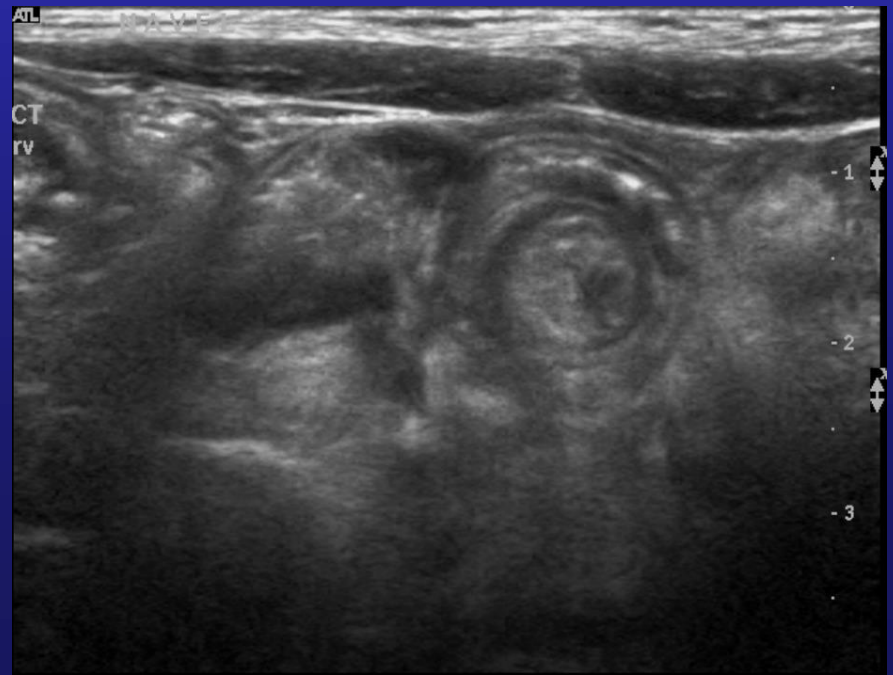
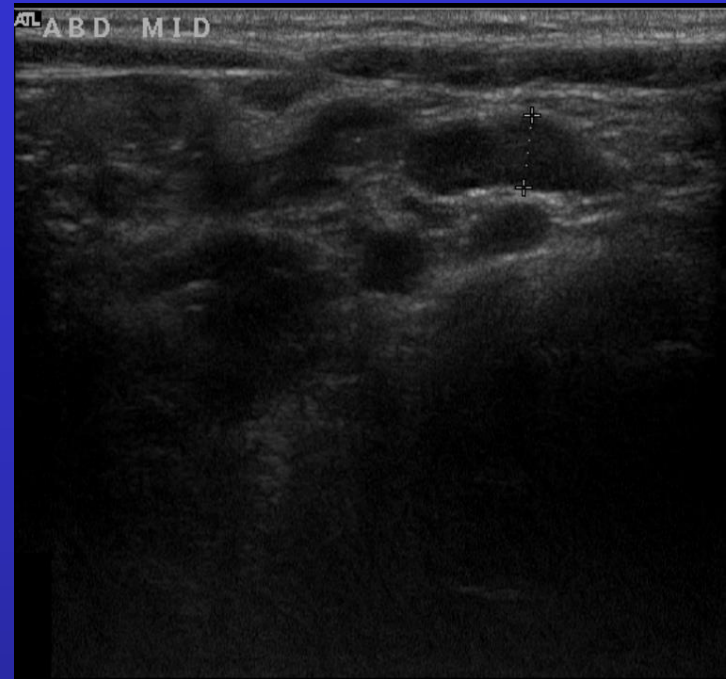
Mesenteric lymphadenitis

Clinical presentation

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

Imaging priority

- US



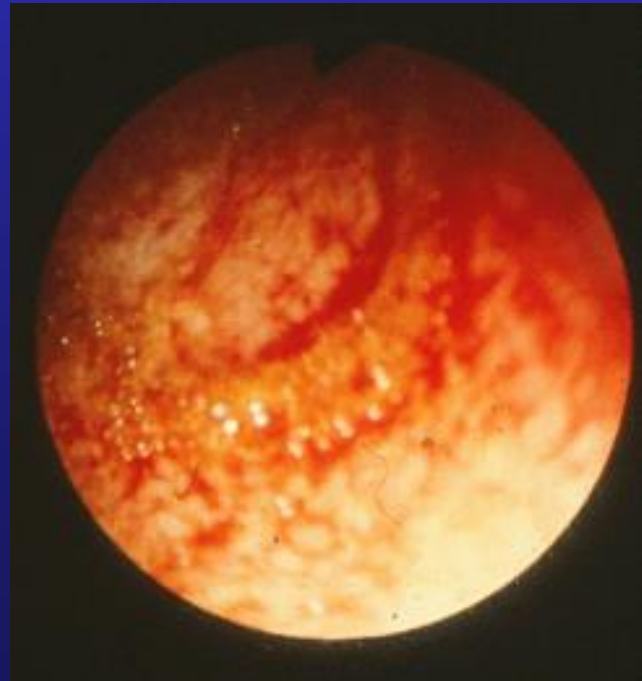
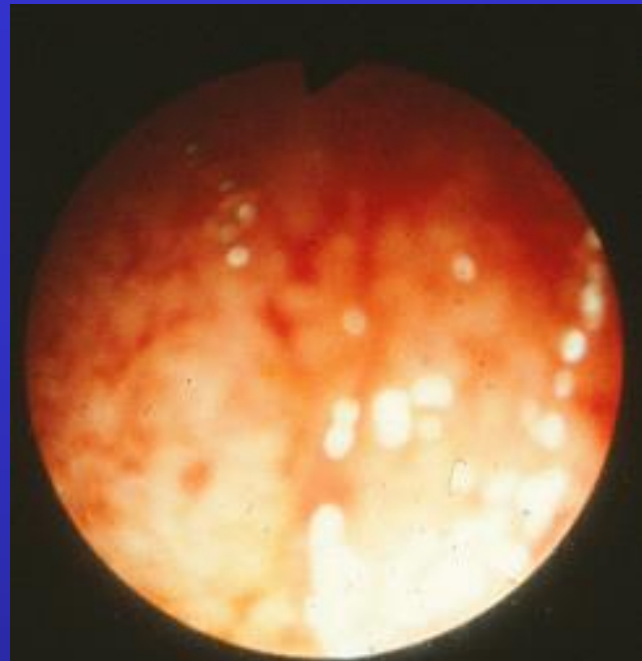
IBD Ulcerative colitis

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 entroclysis





Sonographic finding and barium
enemaby colitis ulcerosa

IBD Crohn disease

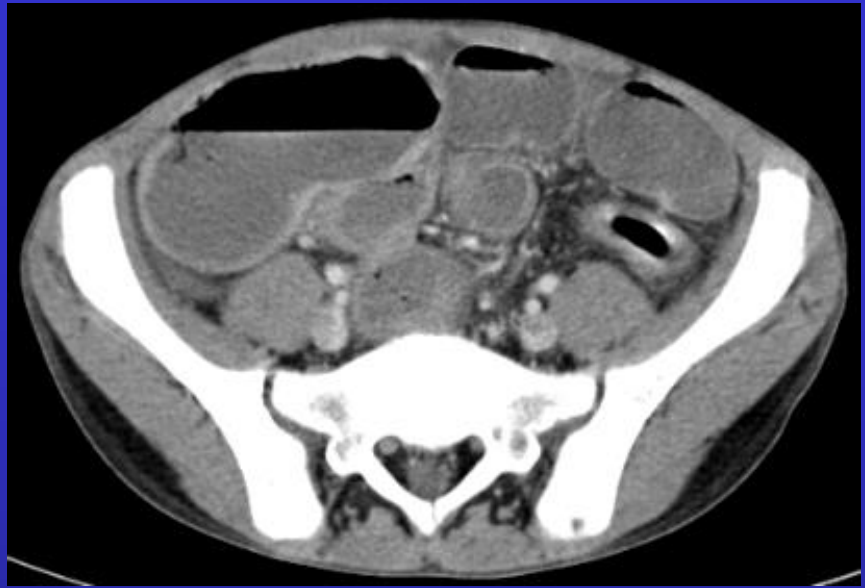
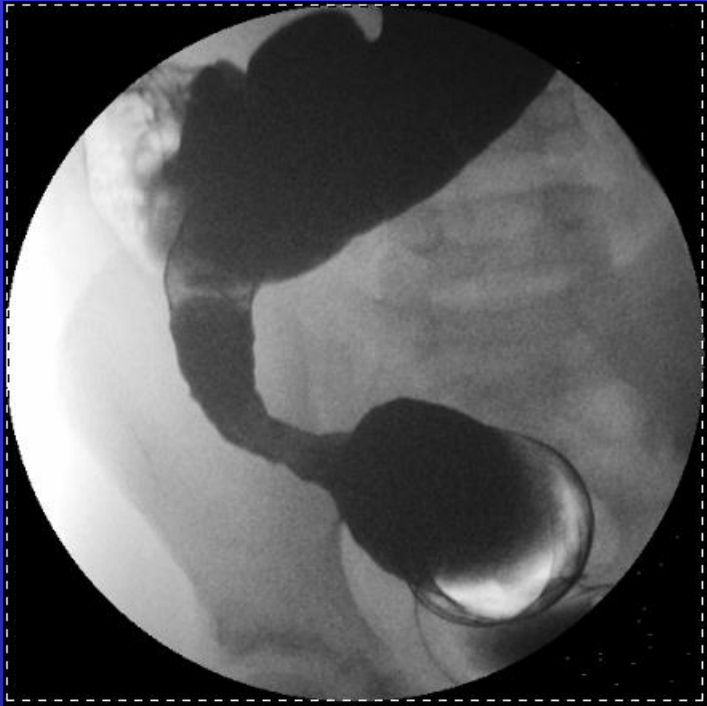
Clinical presentation

- Abdominal pain
- Diarrhoea
- Frequent bowel movement
- Fatigue
- malabsorption
- Unrelated to the GI tract
 - Iritis
 - Joint pain
 - Skin lesion
 - Aptheus ulcera
 - Growth failure
 - Abscess

Imaging priority

- Endoscopy
- US
- MR enteroclyse
- GI series
- CT





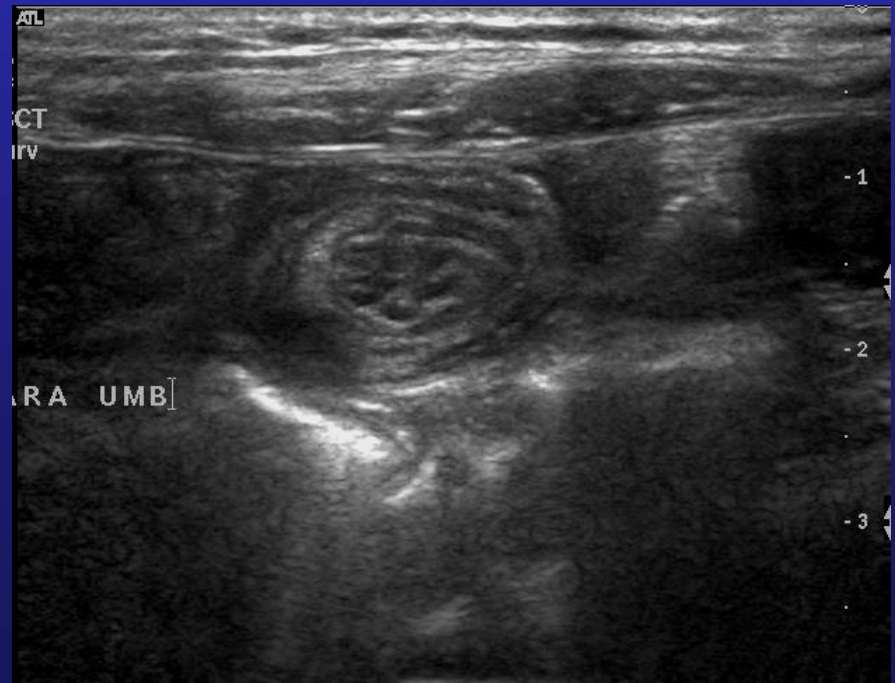
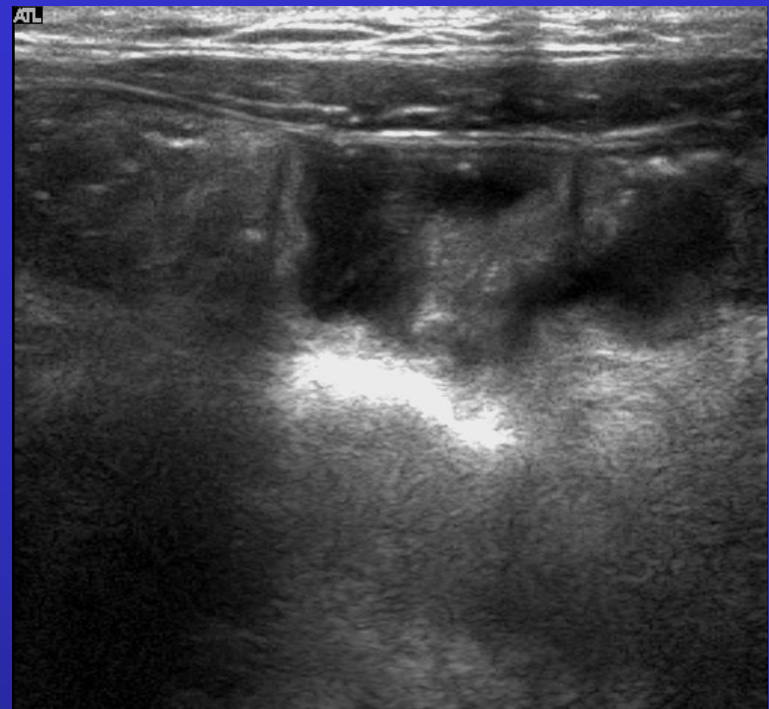
Ileocolitis

Clinical presentation

- Abdominal pain (RLQ)
- Intermittent colicky
- Mild diarrhoea

Imaging priority

- US



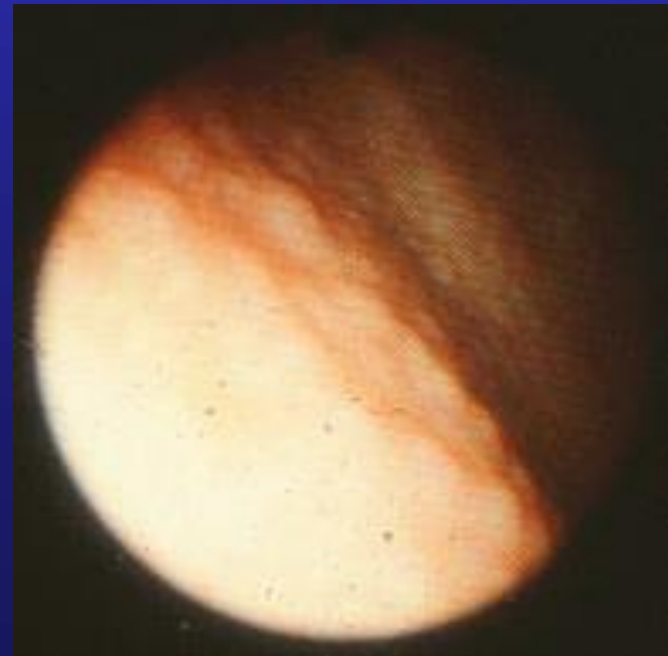
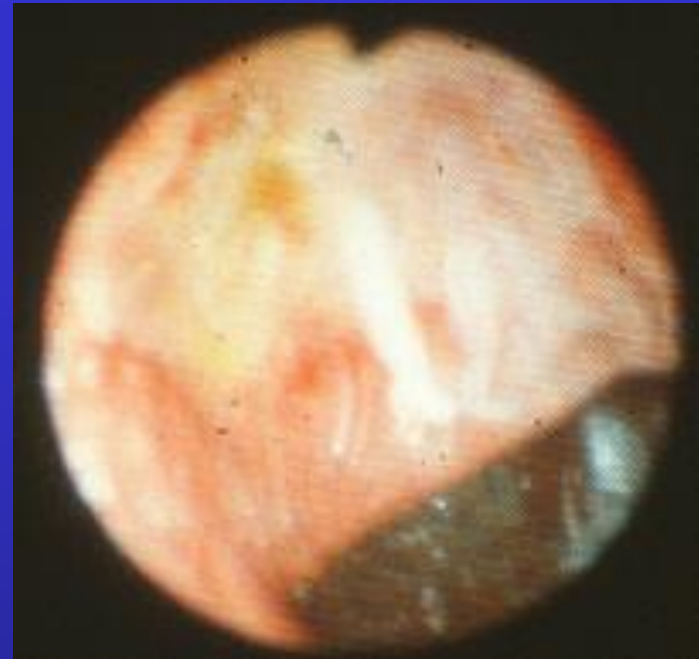
Peptic ulcer

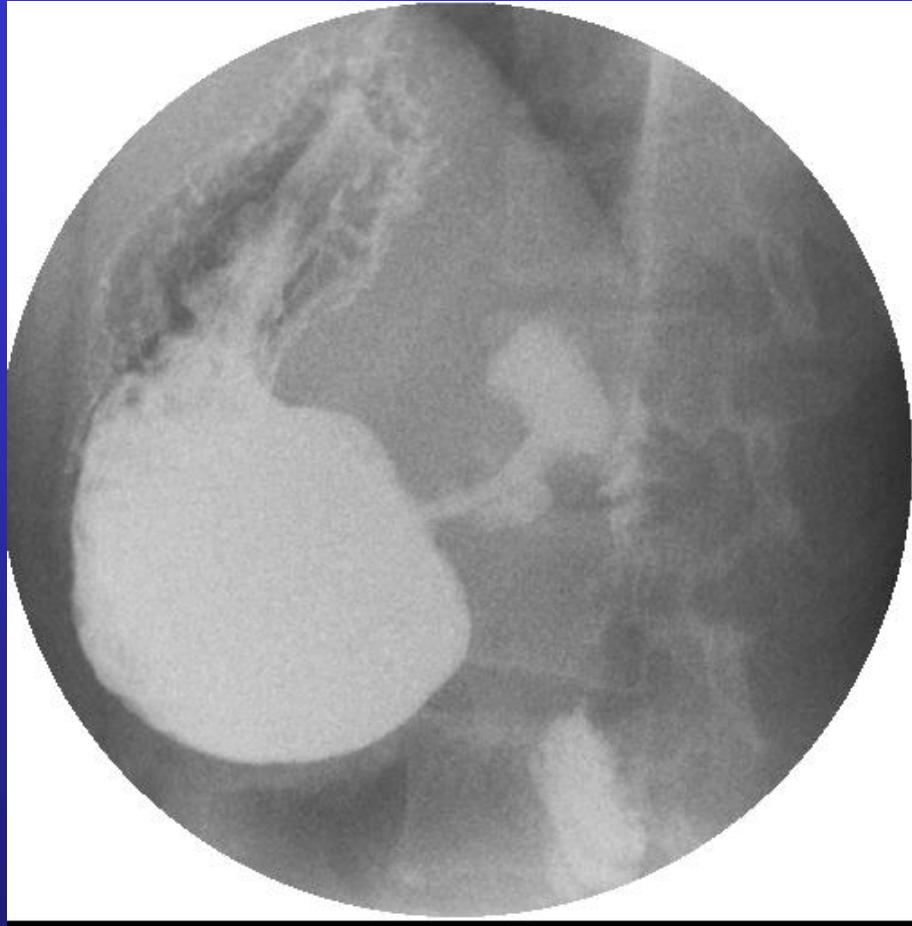
Clinical presentation

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

Imaging priority

- Endoscopy
- GI series





Peritonitis

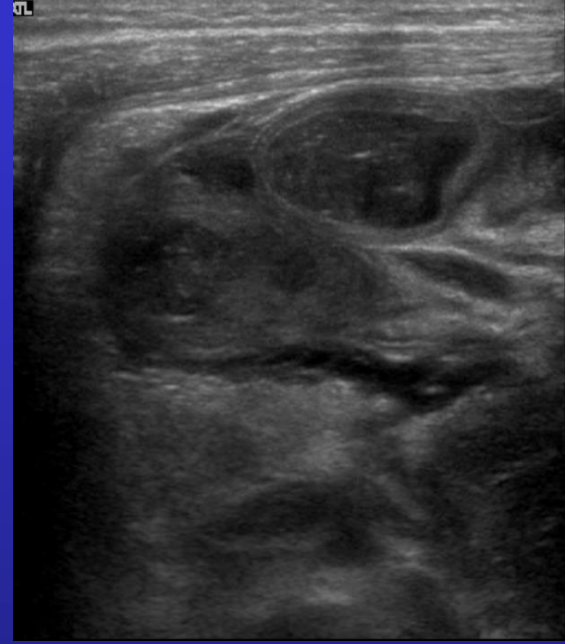
Clinical presentation

- 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 McCaville et al (2004))

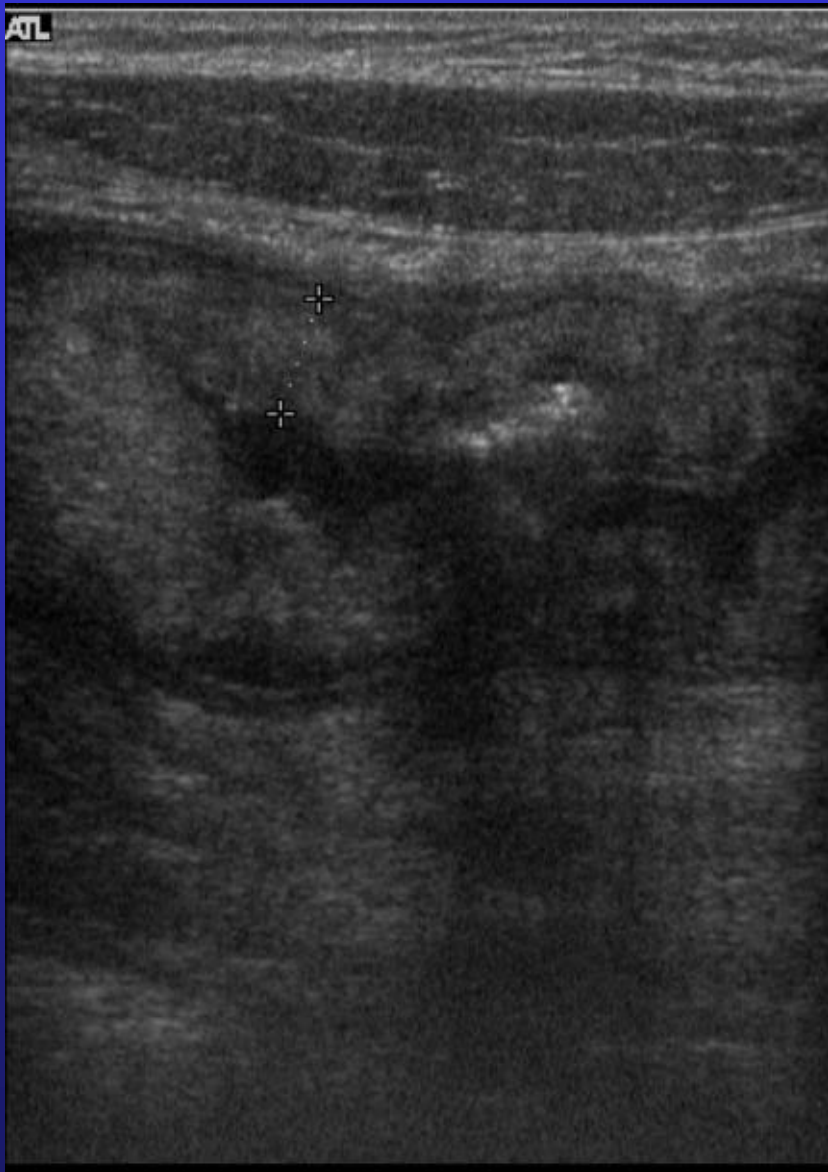
Abdominal pain	91%
Fever	84%
Abdominal tenderness	82%
Diarrhoea	72%
Emesis	64%
Nausea	59%
Constipation	6%

Imaging priority

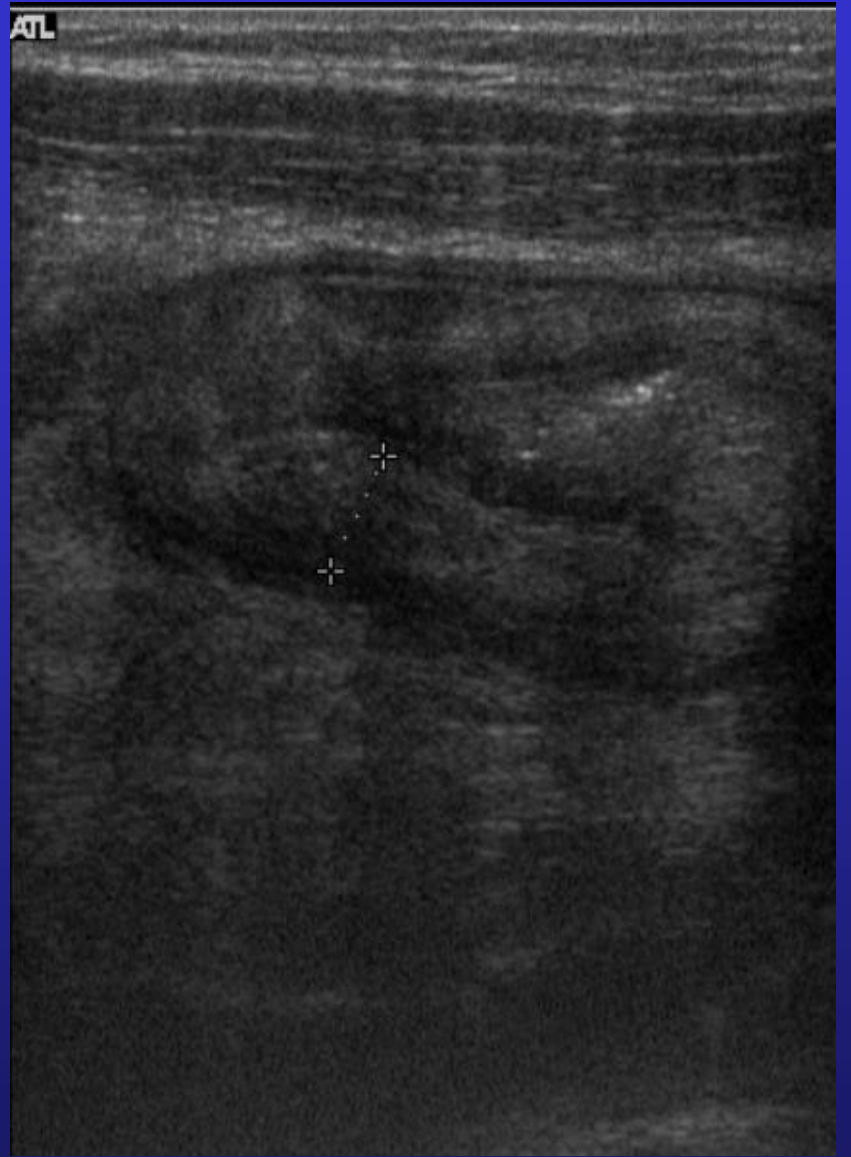
- Abdominal plain film
- US



ATL



ATL



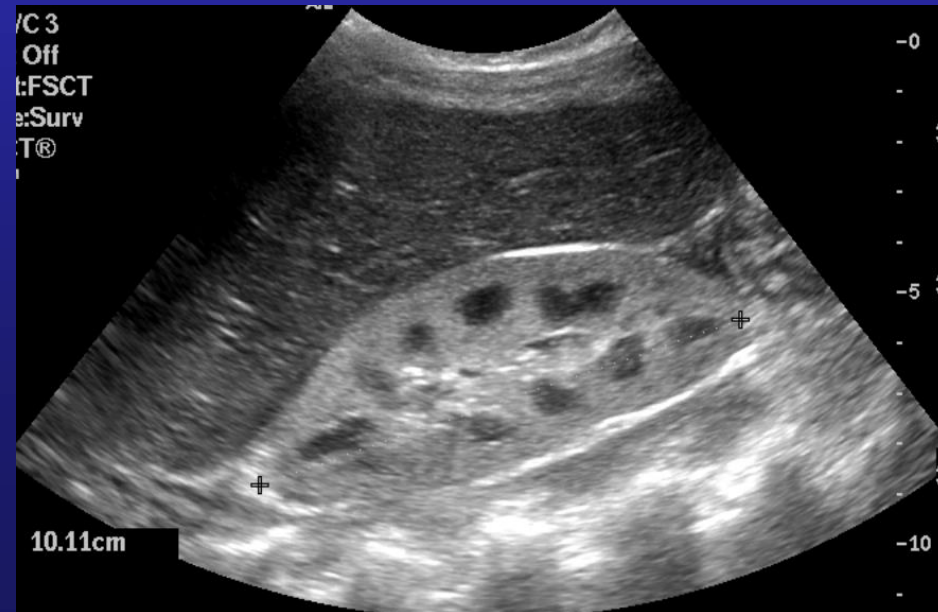
GI hemolytic uremic syndrome from diarrhoea to dialyse

Clinical presentation

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

Imaging priority

- US
- Barium enema



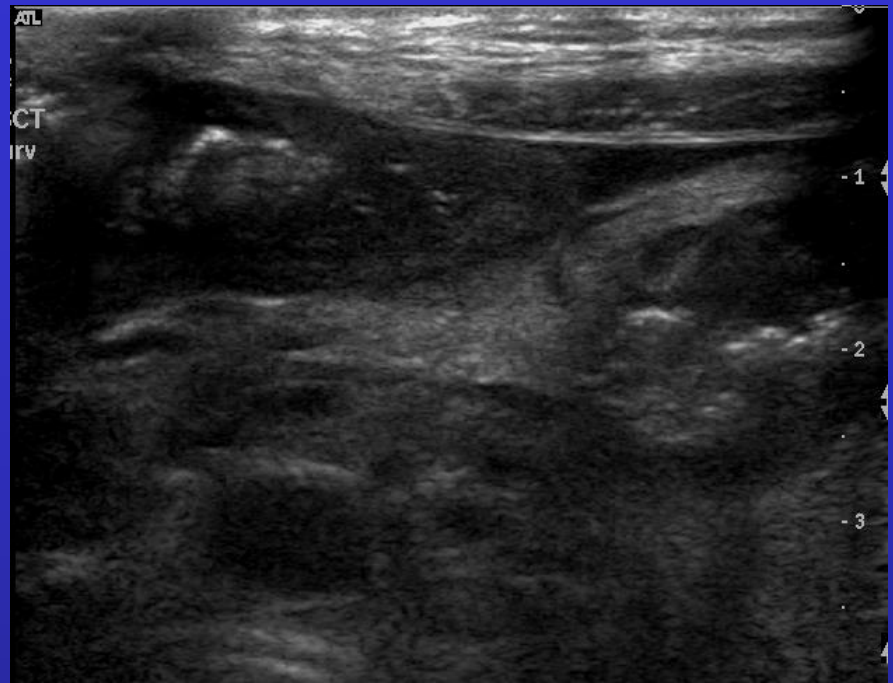
Henoch-Schönlein purpura

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