Imaging in intussusception

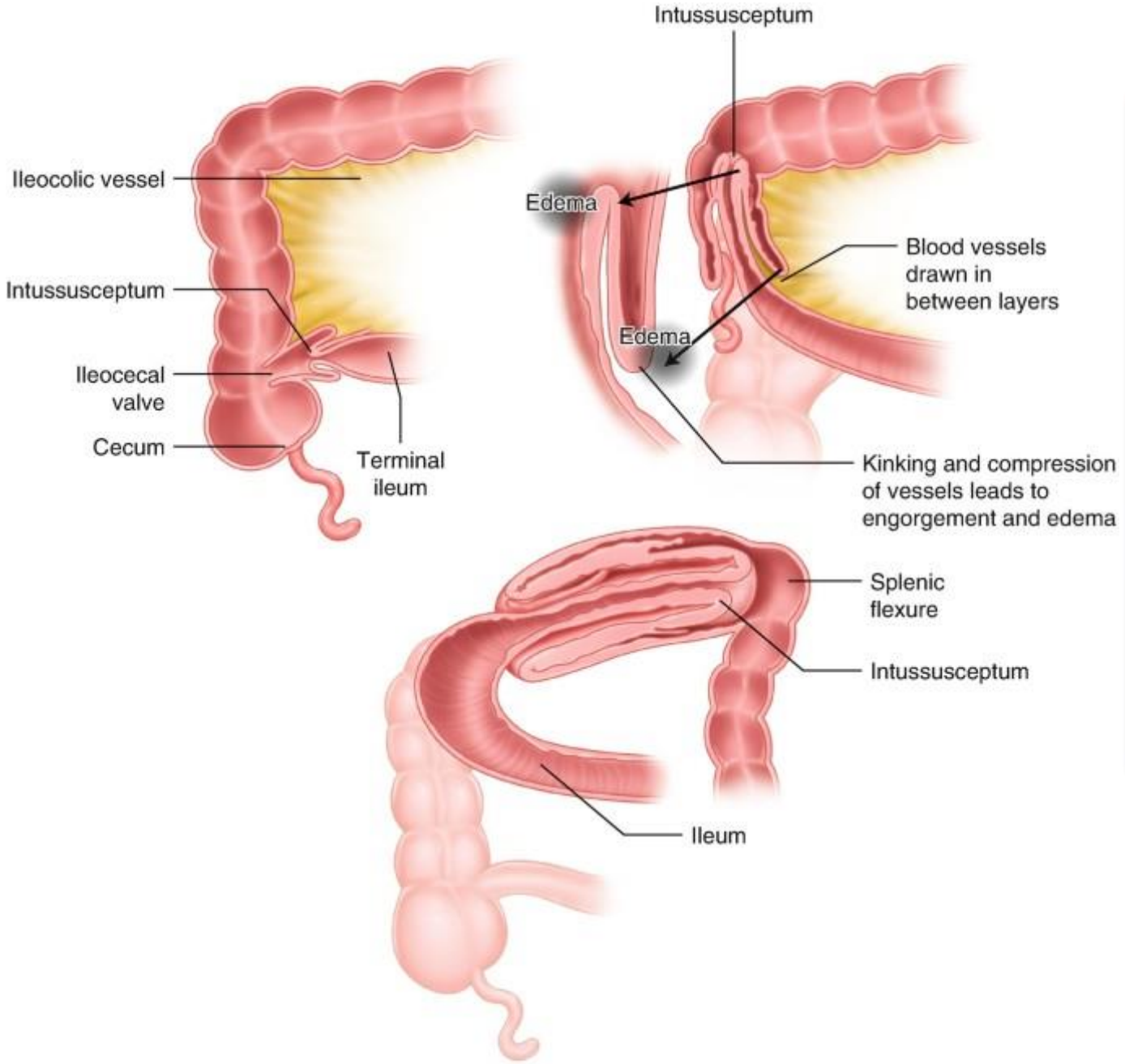
MEHRZAD MEHDIZADEH

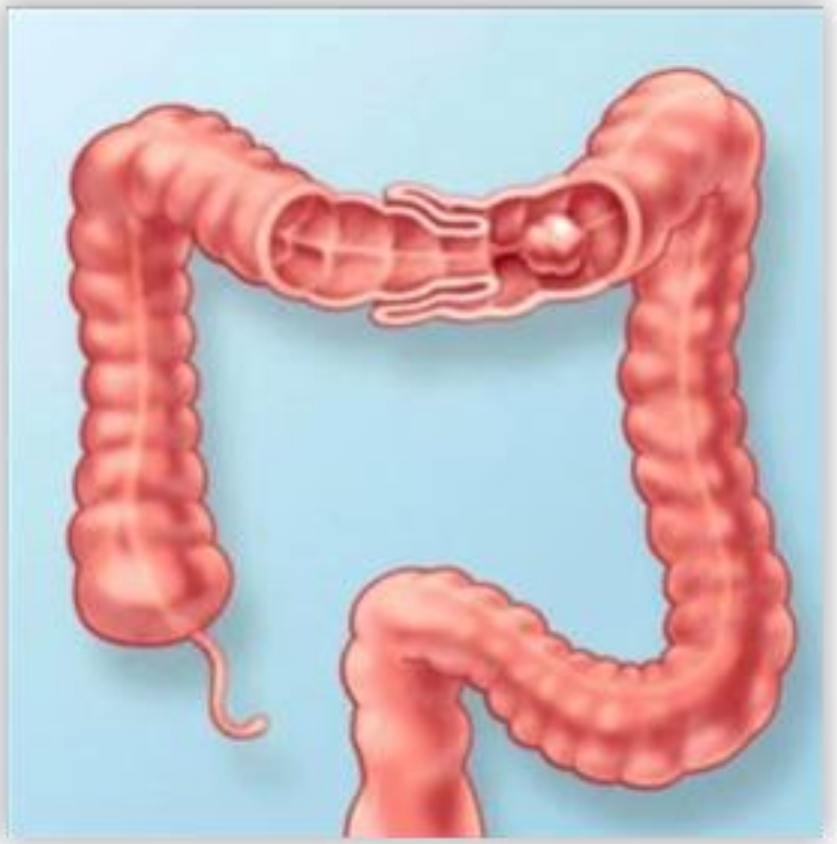
PROF. OF TUMS

CHILDREN MEDICAL CEENTER

pathology

- proximal bowel (called the intussusceptum) pulled into and pushed through distal bowel (called the intussuscipiens) by peristalsis
- usually requires a lead point as a cause:
  - typically lymphoid tissue in children (which can be hypertrophied due to intercurrent illness)
  - often a polyp or tumor in adults

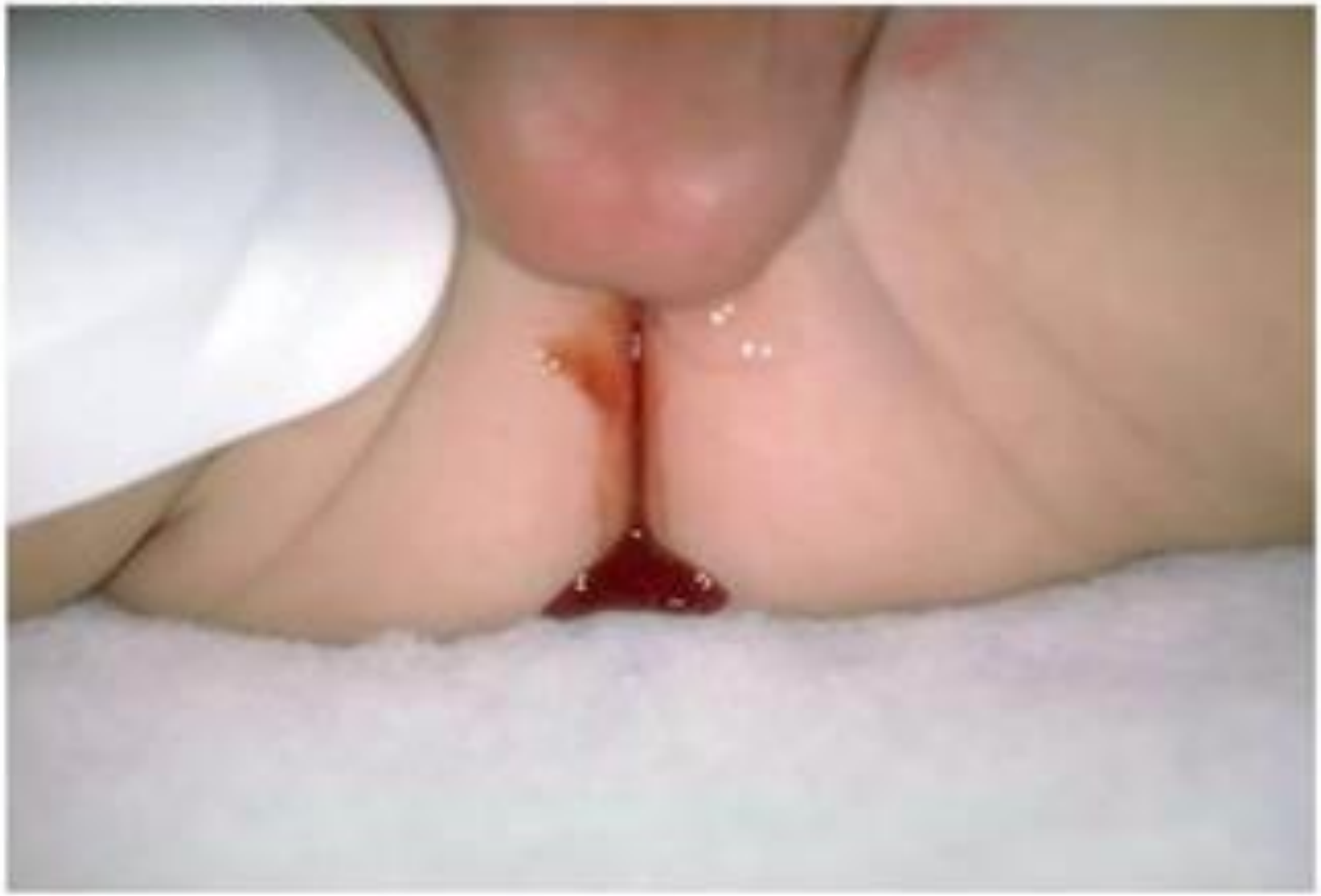

Ileocolic vessel
Intussusceptum
Ileocecal valve
Cecum
Terminal ileum
Intussusceptum
Edema
Edema
Blood vessels drawn in between layers
Kinking and compression of vessels leads to engorgement and edema
Splenic flexure
Intussusceptum
Ileum



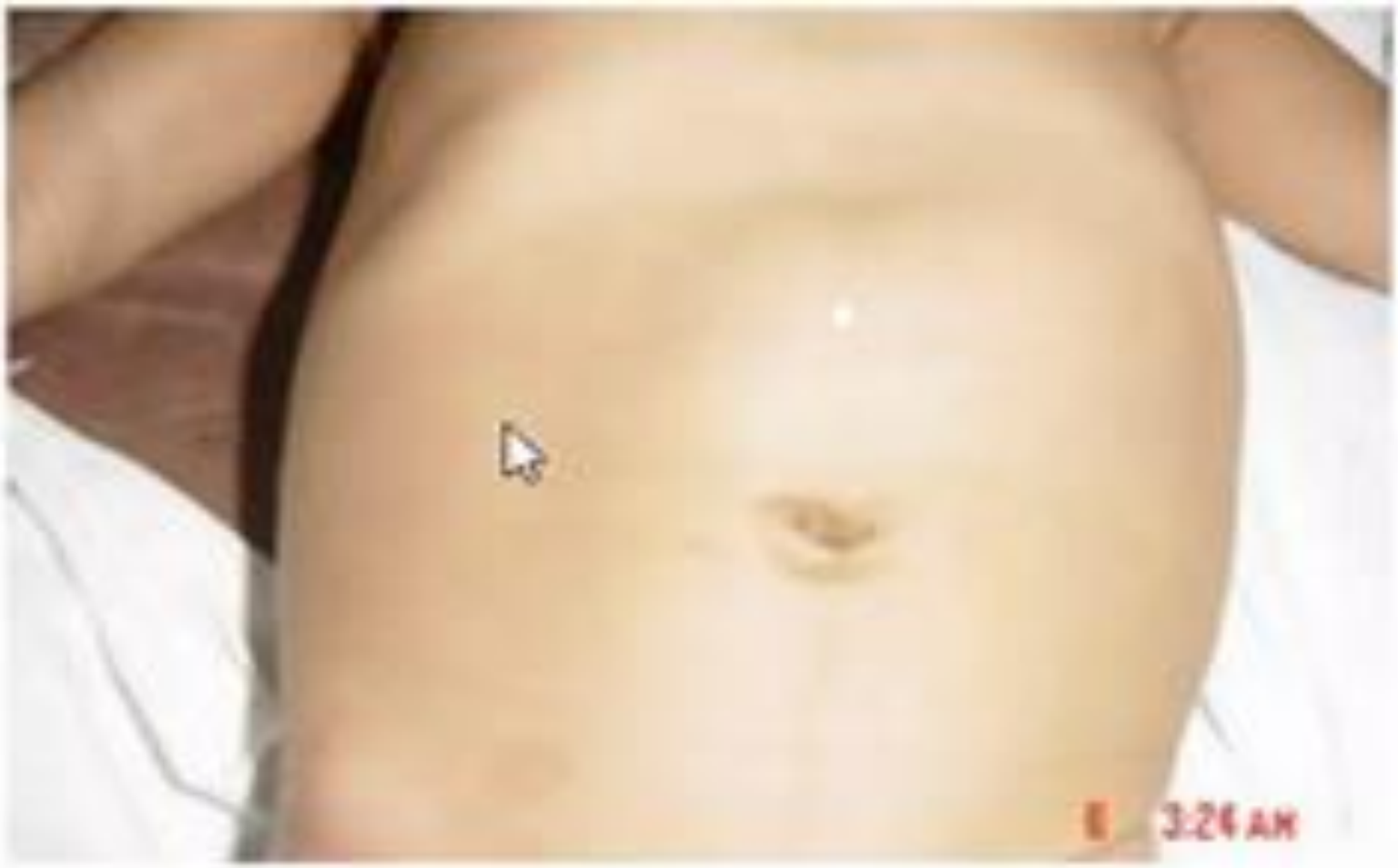
DIAGNOSTIC TESTS & INTERPRETATION

- **Lab:**
  - No lab testing is routinely necessary.
  - Consider serum electrolytes, glucose, and CBC with appropriate symptoms
  - Consider routine preoperative lab assays as per institutional protocol.

REDCURRANT JELLY STOOL



Dance’s sign

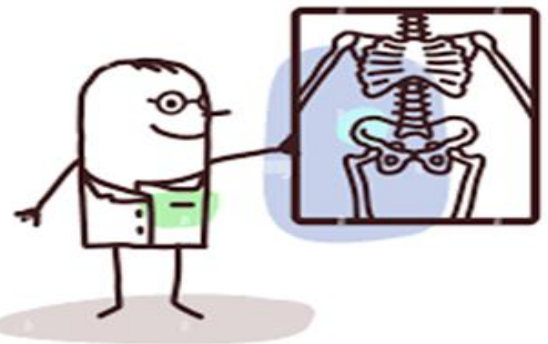


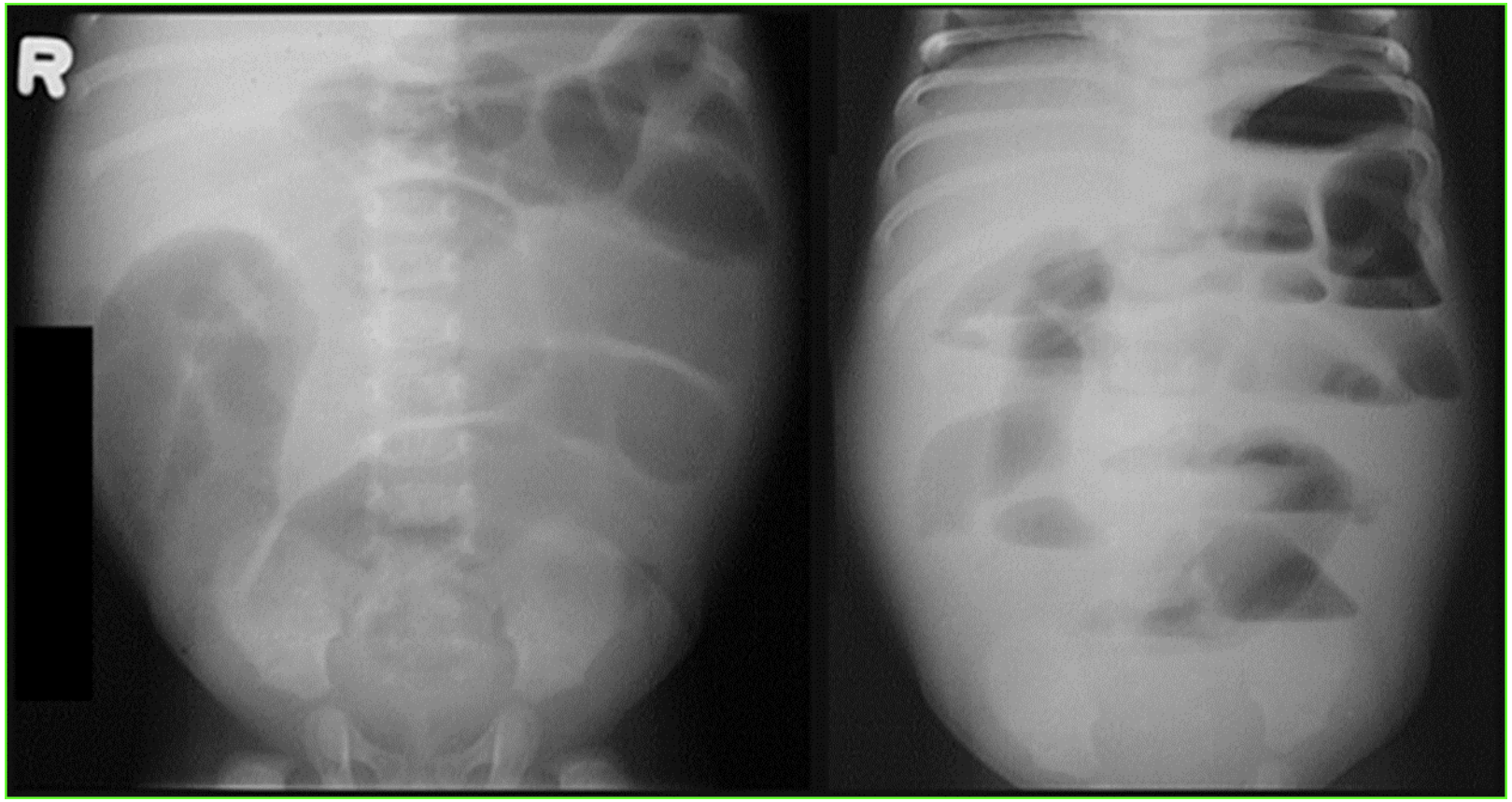
Imaging:

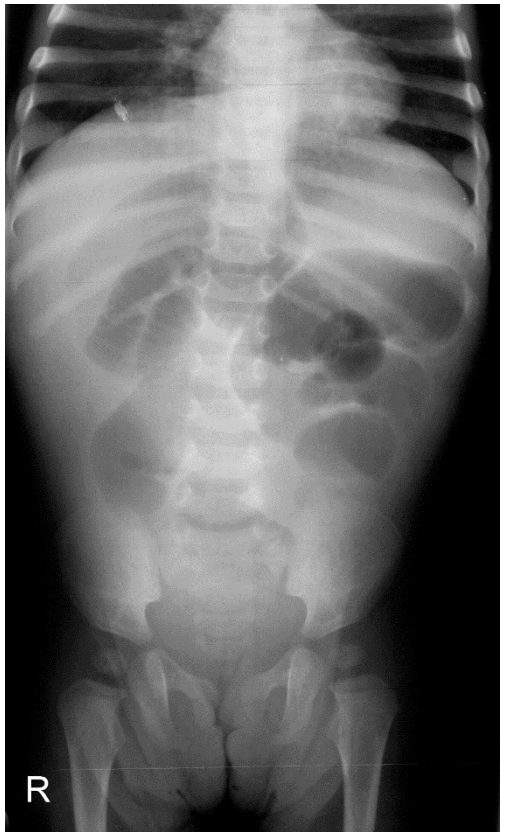
- **Plain radiograph:**May show features of bowel obstruction, with dilated bowel proximal to the intussusception and collapsed bowel distally
- Diagnosis in children often made by ultrasound, giving the target sign appearance of bowel within bowel
- Contrast enema may be used for diagnosis and treatment
- CT is often use in adults, which may also delineate the lead point

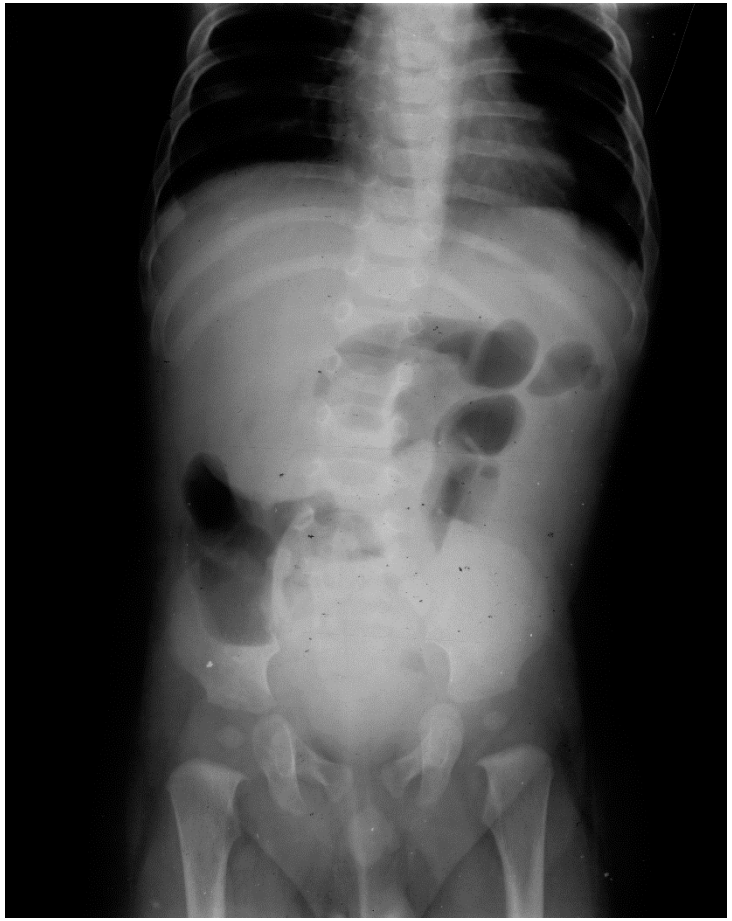
Imaging: Abdominal x-ray

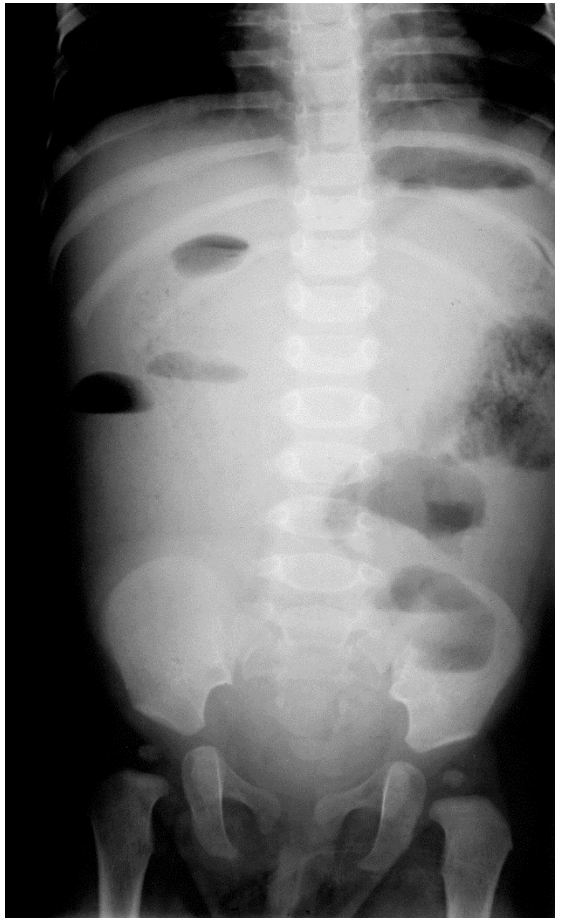
- Not sensitive or specific.
- Normal in early stages 25%.
- later can have absence of gas in right lower quadrant (RLQ) and RUQ, as well as RUQ soft tissue mass; with obstruction, will have air-fluid levels, paucity of distal gas.

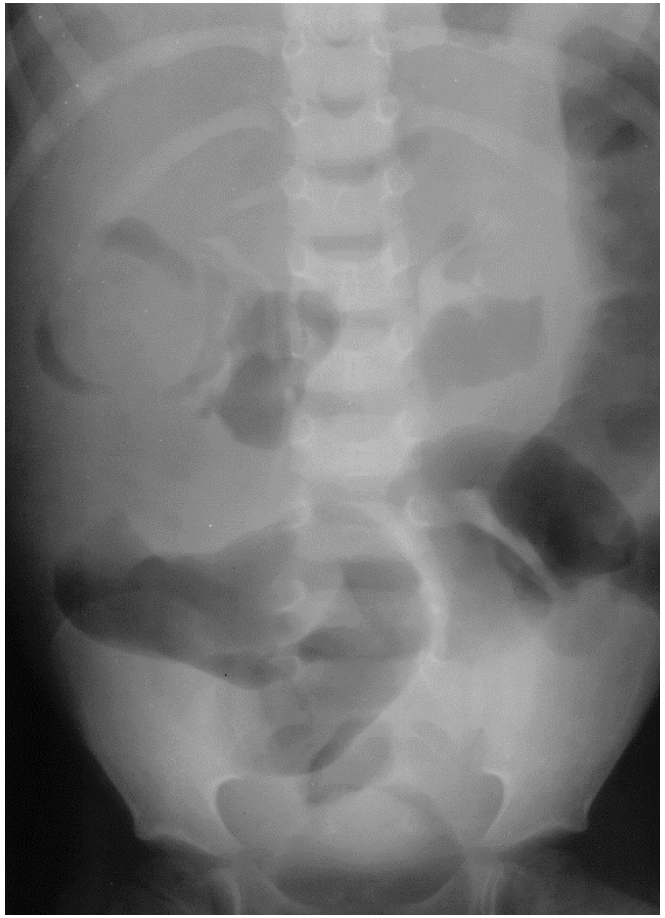



R

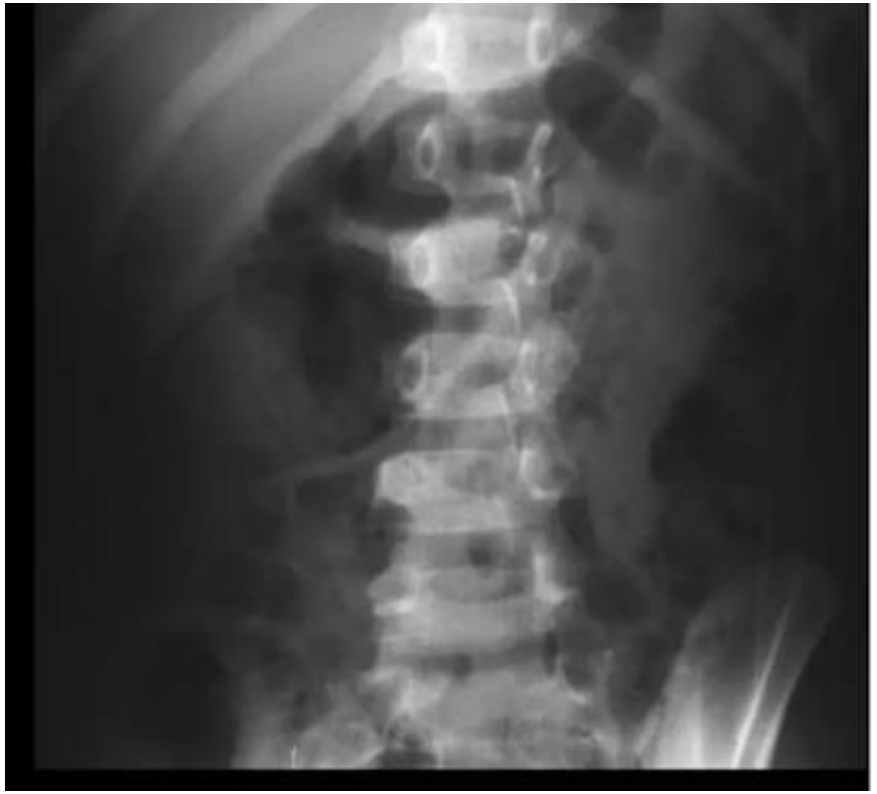

R

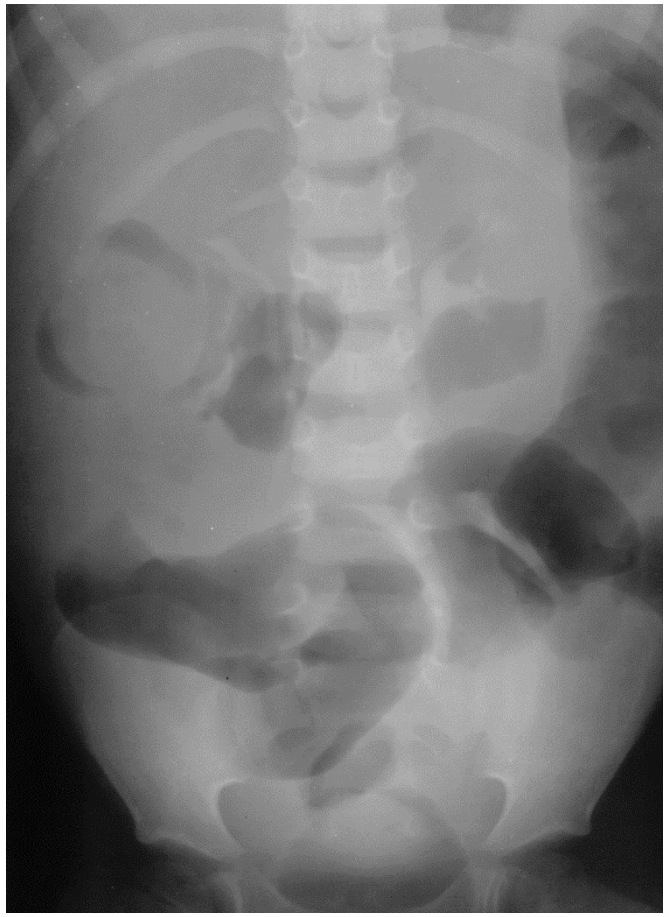






1. The target sign is a rounded soft tissue mass representing the intussusception, with concentric lucencies due to the presence of mesenteric fat within the mass





2. The meniscus sign is a crescent of gas within the colonic lumen outlining the apex of the intussusception

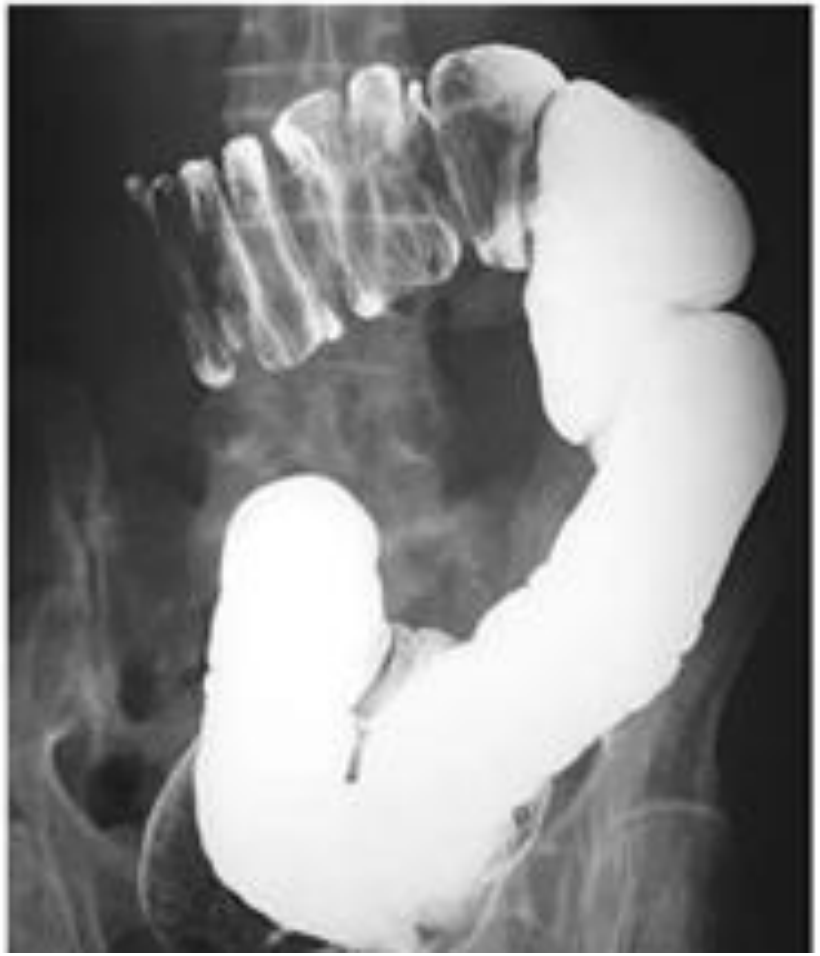
Barium enema

- was the gold standard for diagnosis of intussusception until the mid-1980s.

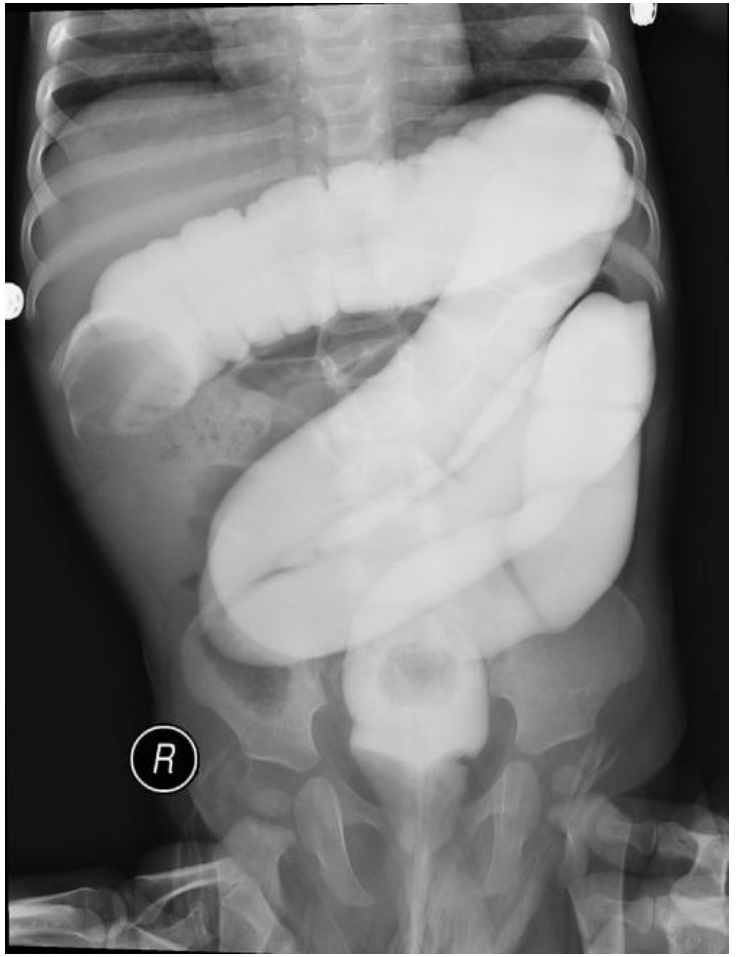
Diagnostic and therapeutic with reduction often achieved; air enema preferred because less perforation risk than barium; can miss a lead point

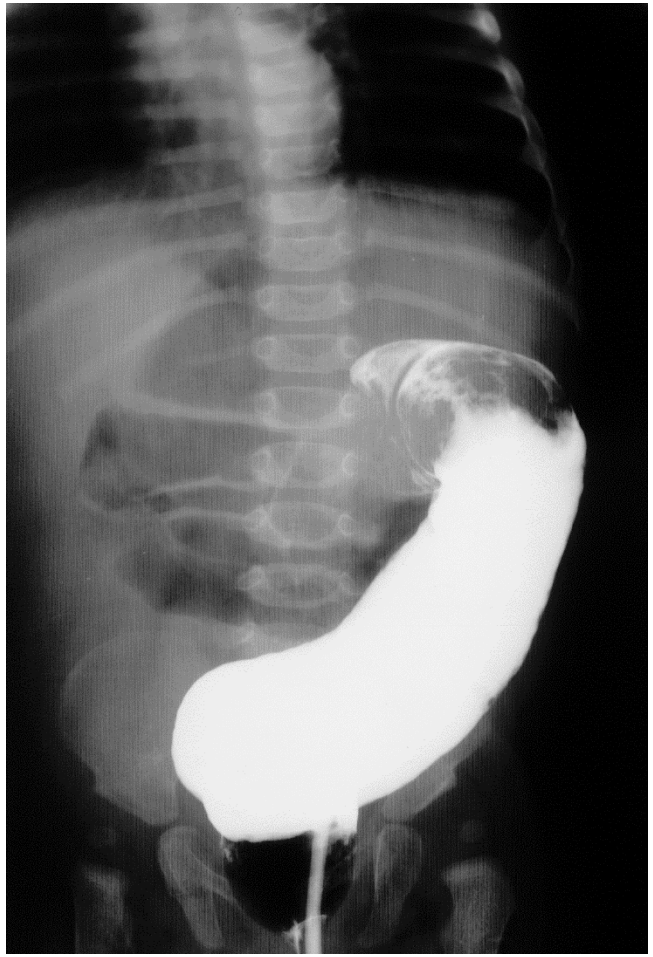
Fluoroscopy

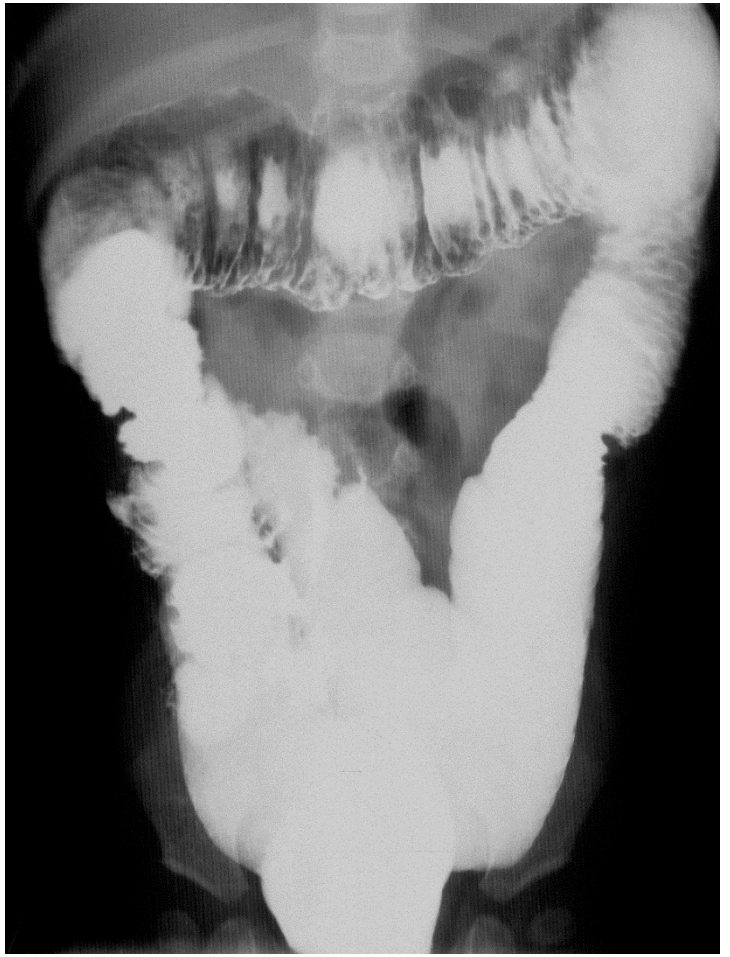
- Contrast enema will show the level of an intussusception as a mass protruding into the lumen and blocking retrograde contrast flow.
- Air enema may be effective at reducing the intussusception: air is insufflated under pressure to gently push the intussusceptum back out of the intussuscipiens.



the coiled spring sign which is produced when small amounts of contrast material accumulate between the intussusceptum and intussuscipiens.

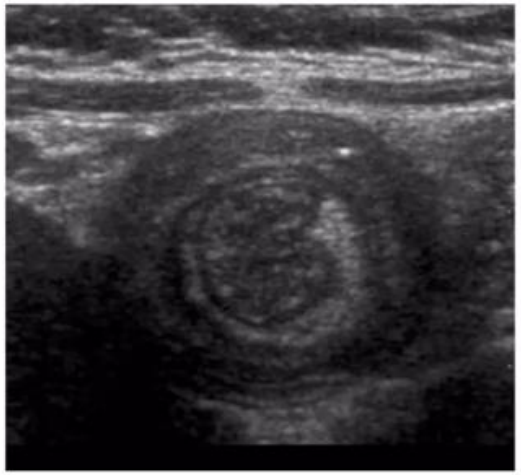

R



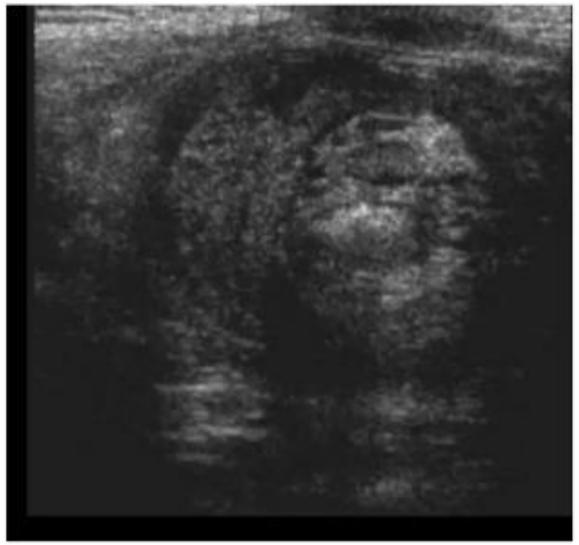


Ultrasound

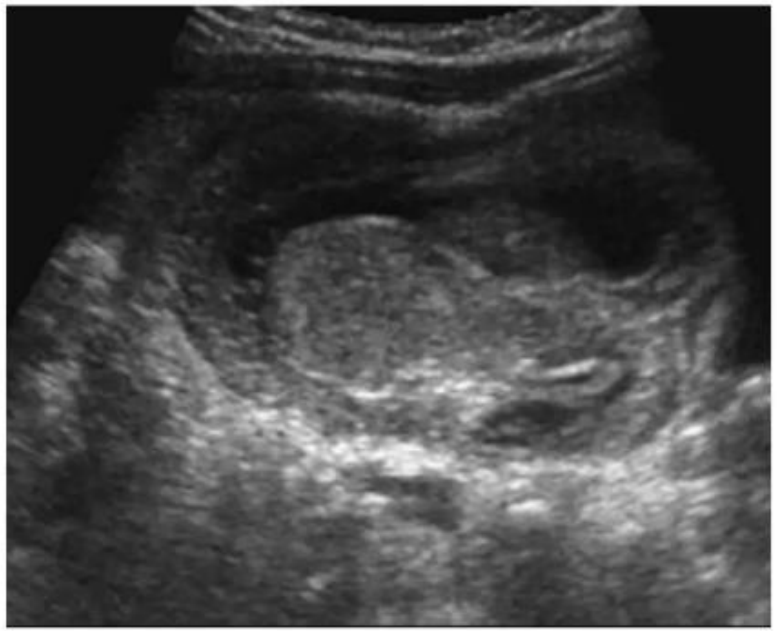
- Sensitive examination for intussusception, particularly in children. Target sign or doughnut sign of bowel in bowel is the most striking finding .
- May also identify lymph nodes or other lead point.



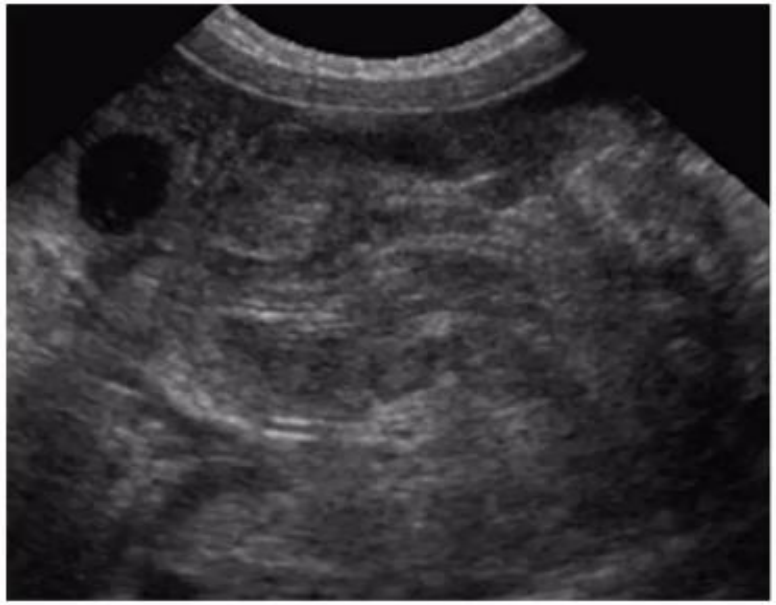
Enlarged lymphoid tissue or lymph nodes may be seen within the mass in transverse or longitudinal section

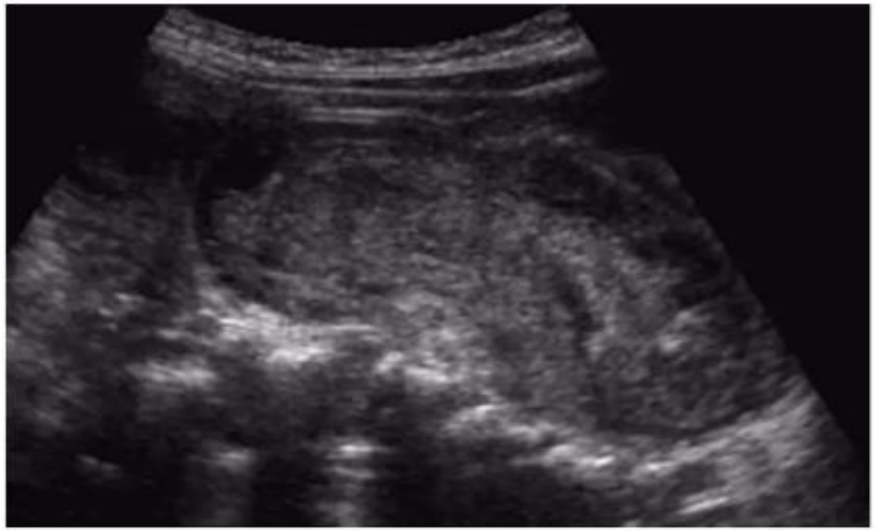


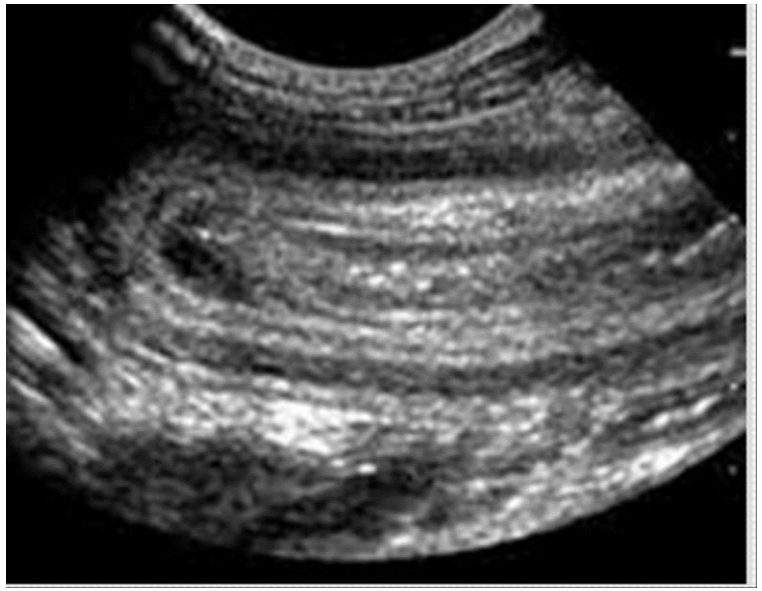
Other sonographic features such as trapped fluid between the layers of bowel

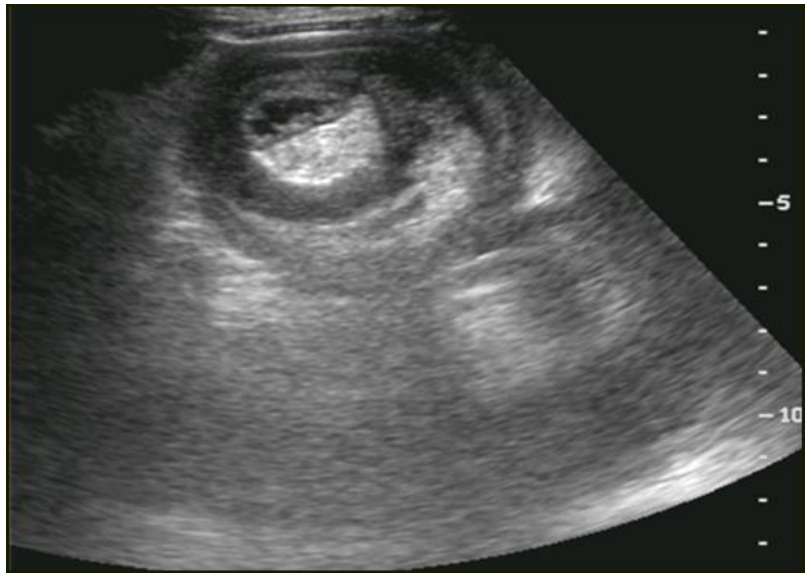


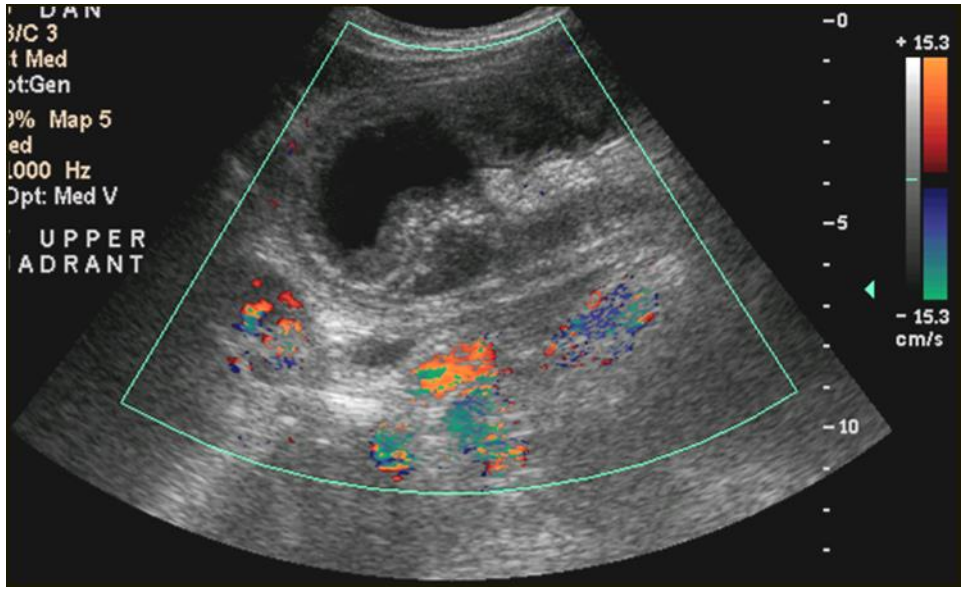
- In longitudinal section the mass is roughly ovoid in shape, with different tissues appearing layered longitudinally. This appearance is often likened to a sandwich or called the pseudokidney sign

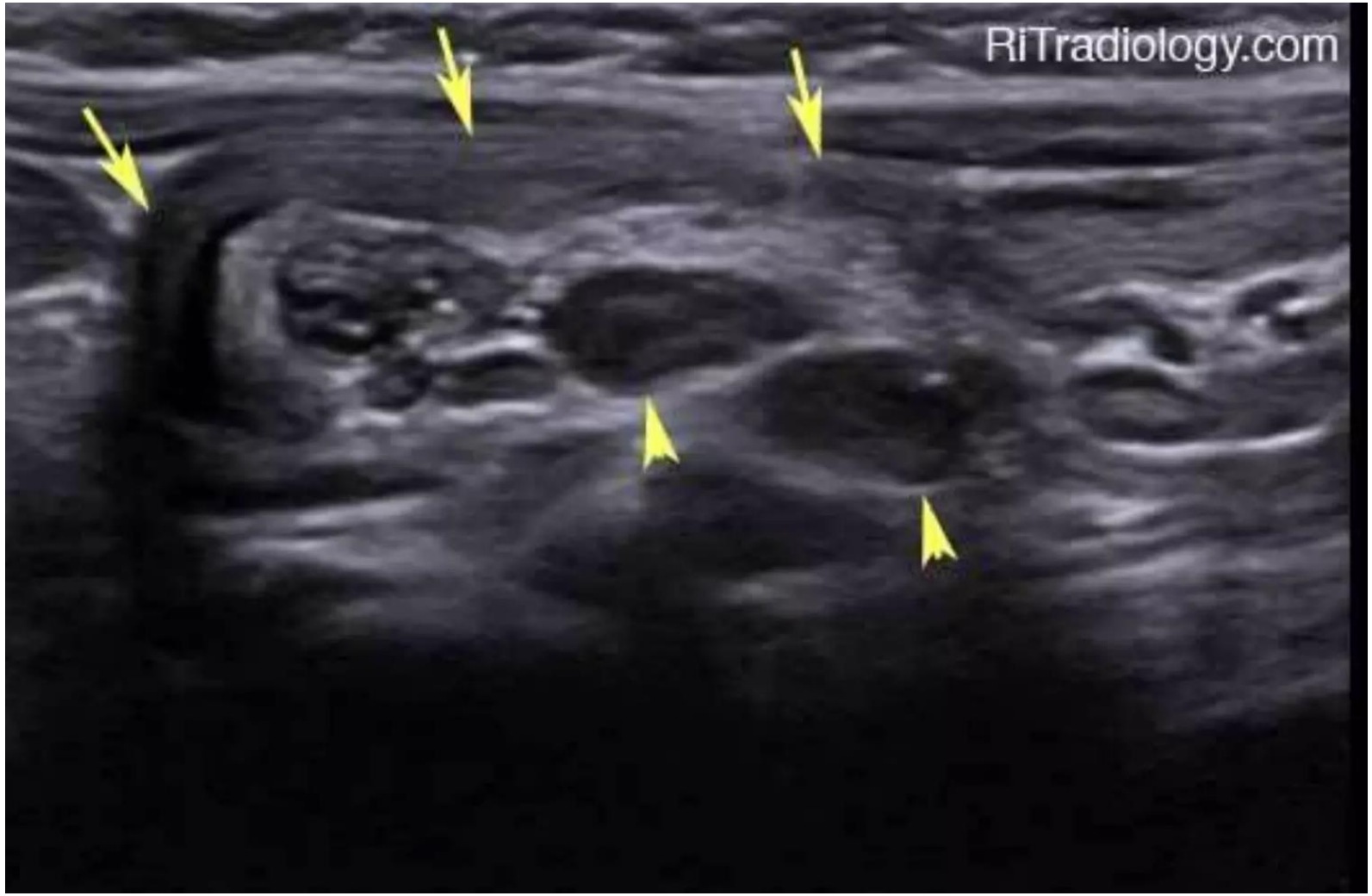


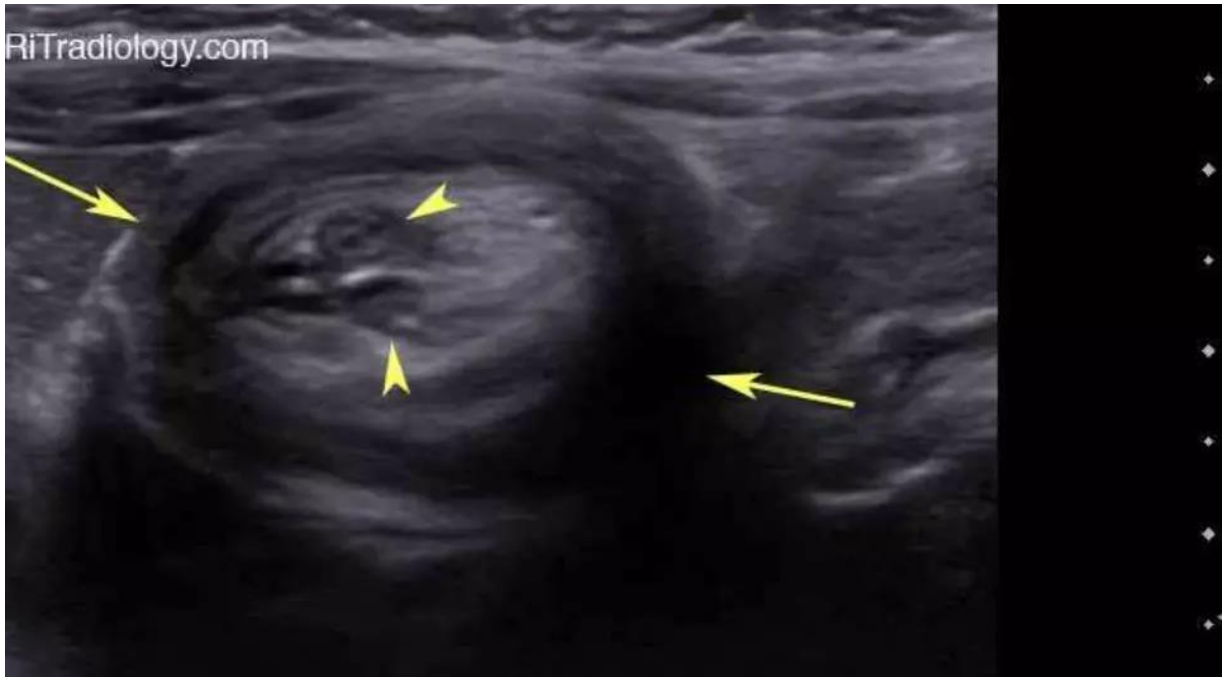


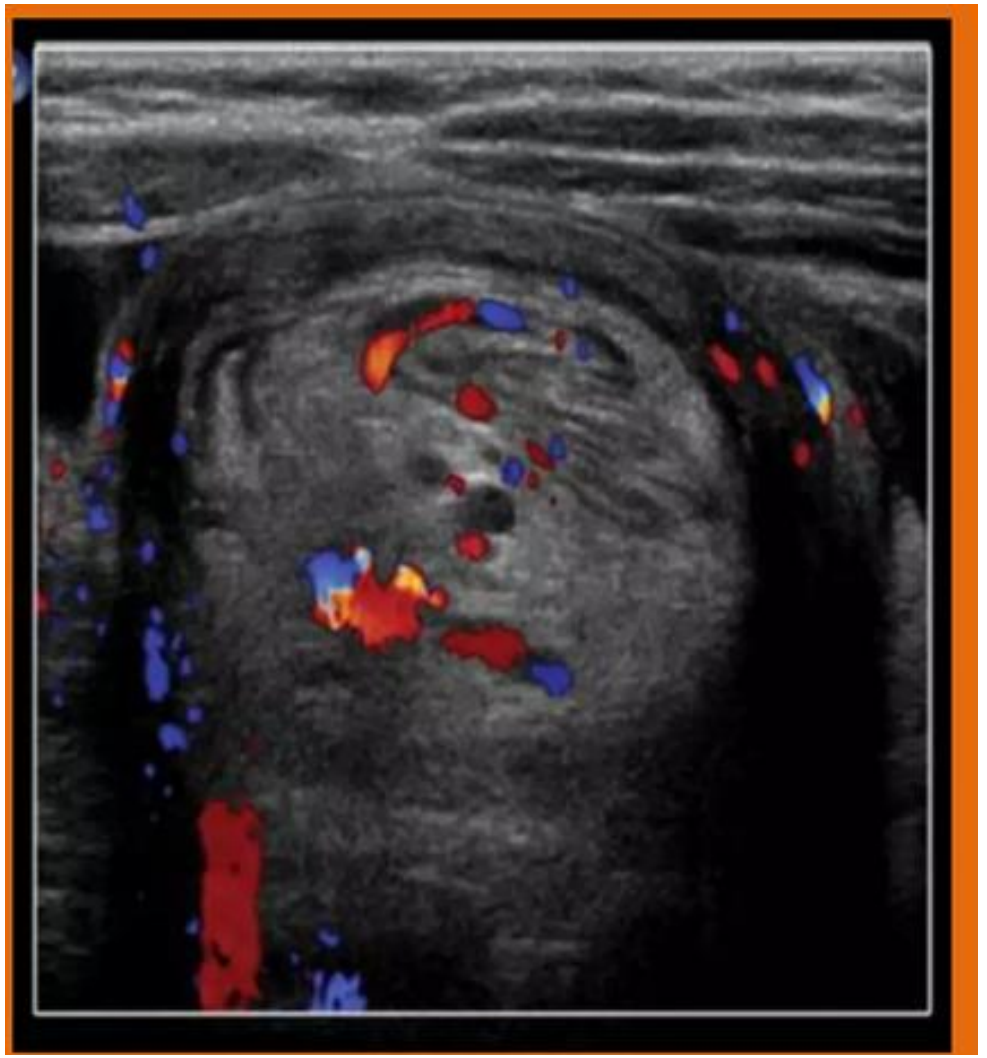



-5
-10


UPPER
ADRANT
-0
-5
-10
+ 15.3
- 15.3
cm/s

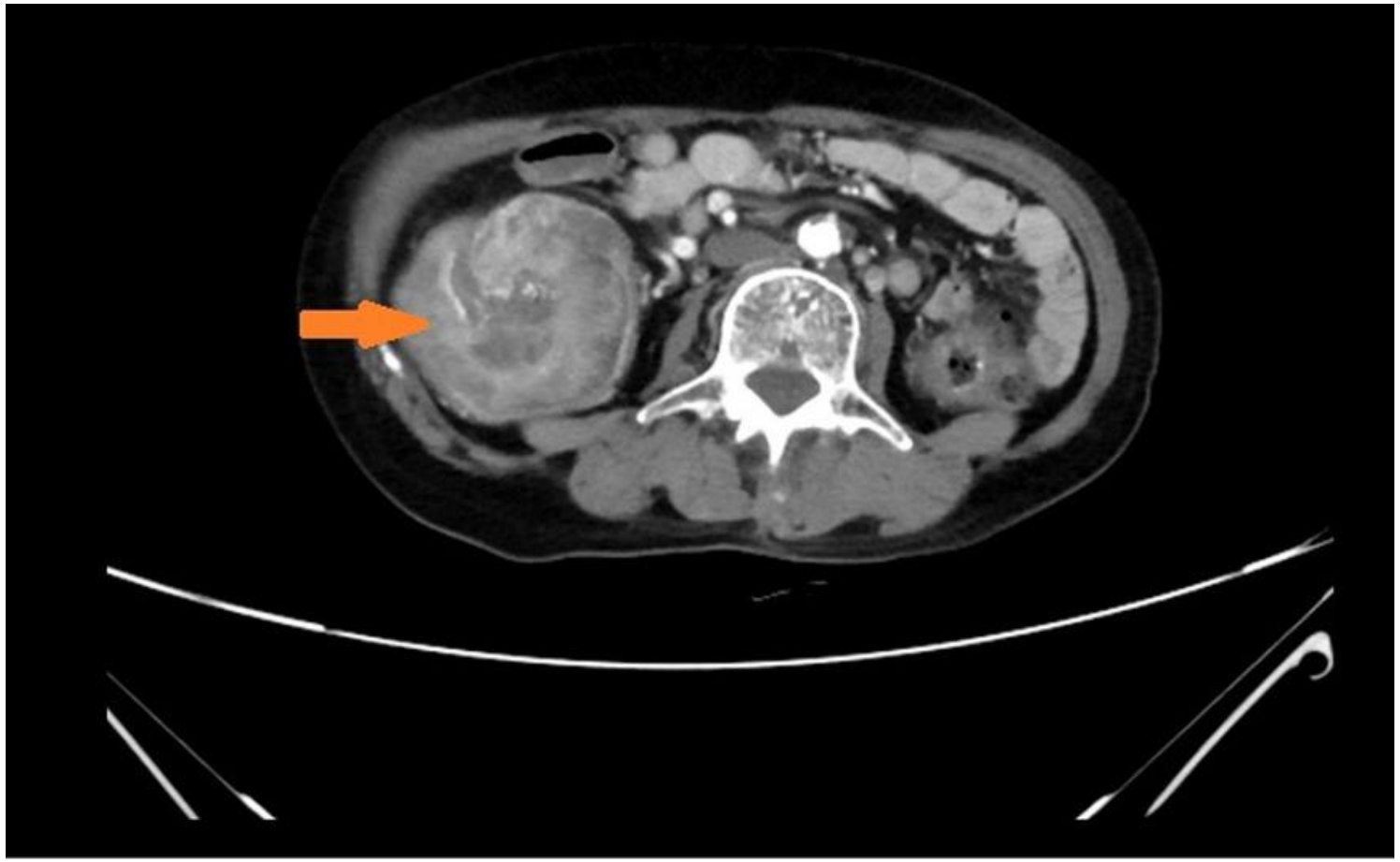

RiTradiology.com

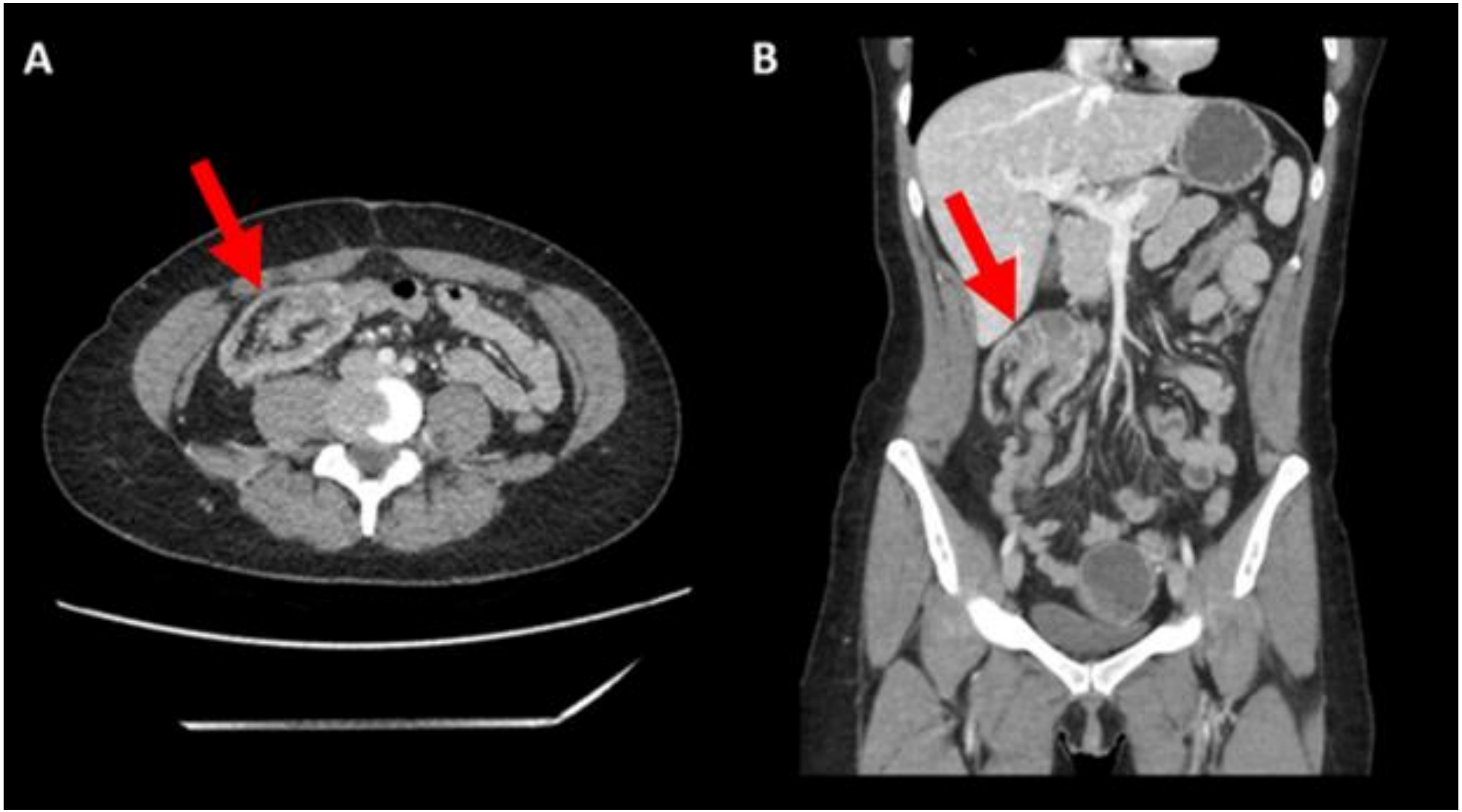

RiTradiology.com

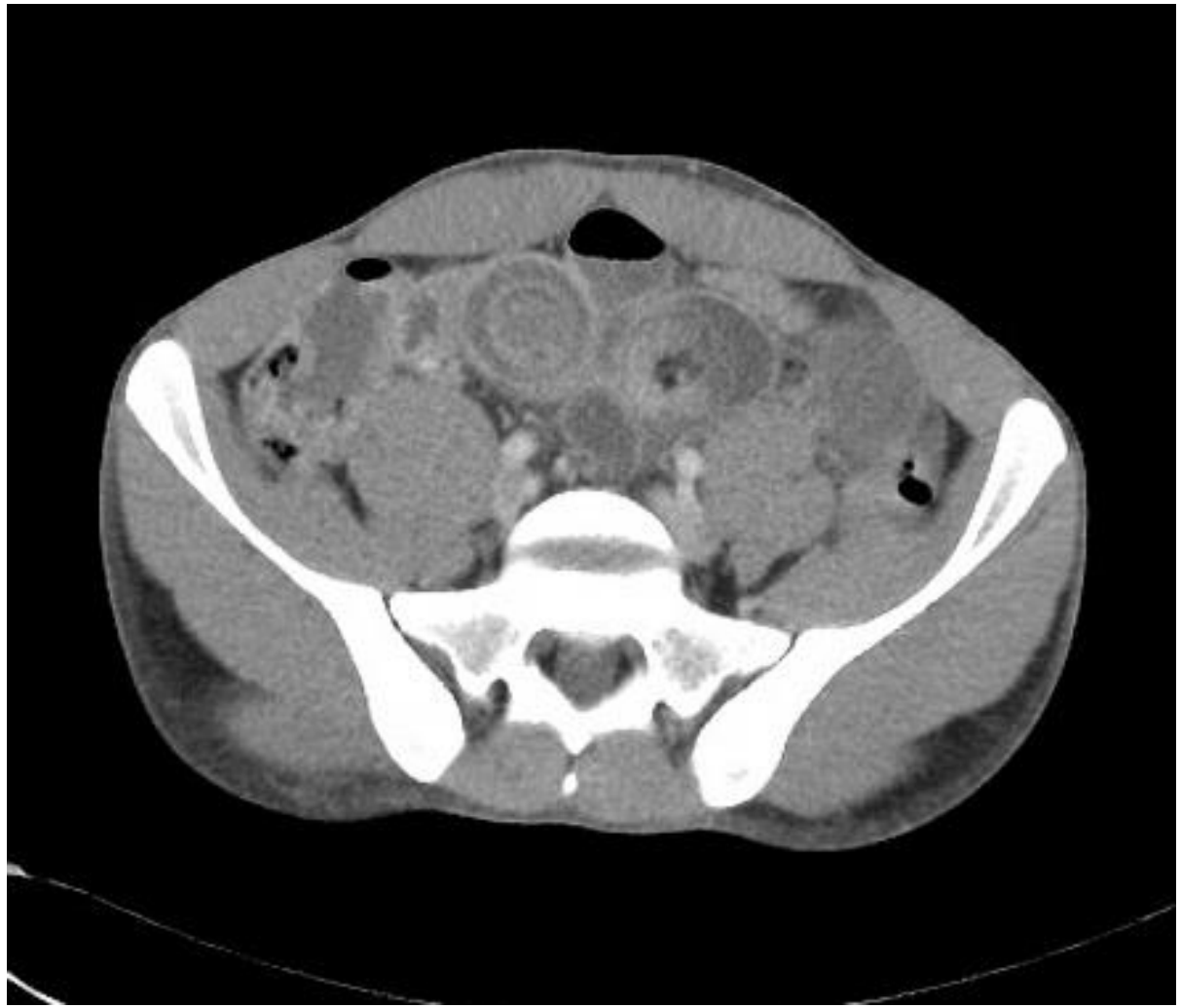


CT

- Less commonly used in children but more common to identify adult intussusception on CT, where assessment of lead point can also be made, and assessment for metastatic disease in the case of a tumor acting as the lead point




A
B



Air contrast or barium enema reduction is the standard nonoperative treatment for intussusception:

- 70–85% success with barium enema
- Up to 90% success with air enema Barium or air contrast enema exam is useful for both diagnosis and therapy.

Complication

- Typically do not occur within the first 24 hrs….
- Bowel obstruction.
- Intestinal ischemia.
- GI bleeding
- Perforation.
- Shock.
- Sepsis.
- dehydration.

Thus we have a window of opportunity in which to treat and avoid surgery.

Treatment for intussusception

Intussusception is not usually immediately life-threatening. It can be treated with either a water-soluble contrast enema or an air-contrast enema, which both confirms the diagnosis of an intussusception, and in most cases successfully reduces it.

treatment

- Successful management of intussusception depends on early recognition and diagnosis, adequate fluid resuscitation and prompt reduction.
- the longer the duration of symptoms (particularly if .24 h) the lower the likelihood of successful nonoperative reduction.
- Decreased reduction rates are also reported when the intussusception is situated in the rectum, in children with small bowel obstruction and those under 3 months of age.

Treatment of Intussusception

- **Conservative management:**

NG drainage , resuscitation with IV fluid ,antibiotics

- **Non operative management:**

- **Operative management:**

Reducible intussusception.

Irreducible intussusception.

Resection with primary anastomosis.

- There are several ways that reduction can be achieved radiologically:
- air-reduction under fluoroscopic guidance
- hydrostatic-reduction under fluoroscopic guidance
- physical reduction under US guidance
- hydrostatic-reduction under US guidance

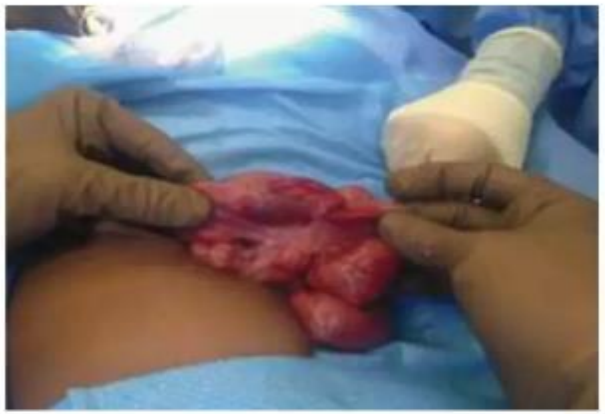
- Assessment with ultrasound prior to the reduction allows stratified risk assessment. Intussusception with reduced vascularity or interloop fluid is usually more challenging to reduce. Most facilities that perform this procedure require IV access, staff, and equipment for fluid resuscitation with the backup of a pediatric surgeon.

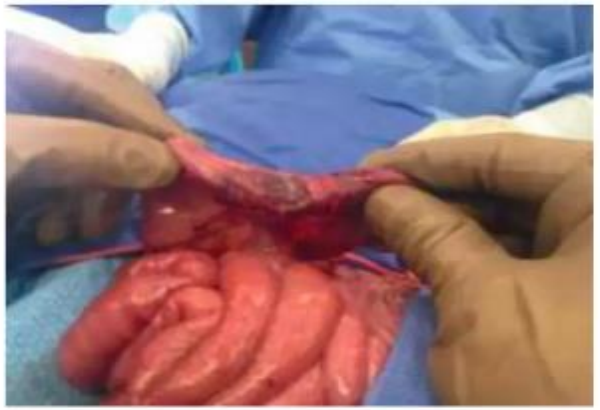
Contraindications

- signs of peritonitis
- Perforation

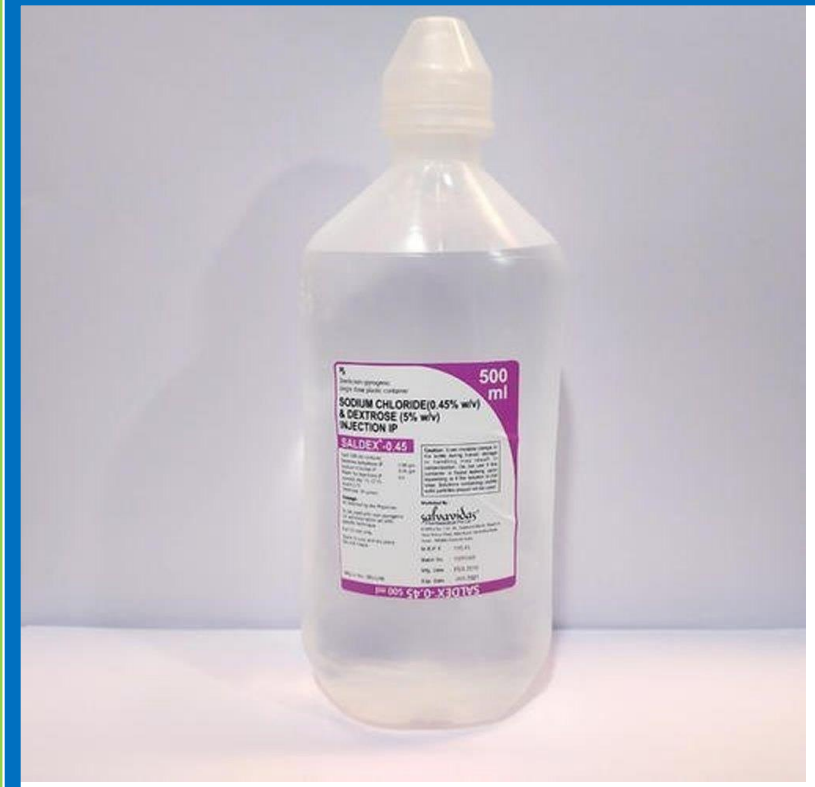
SURGERY/OTHER PROCEDURES

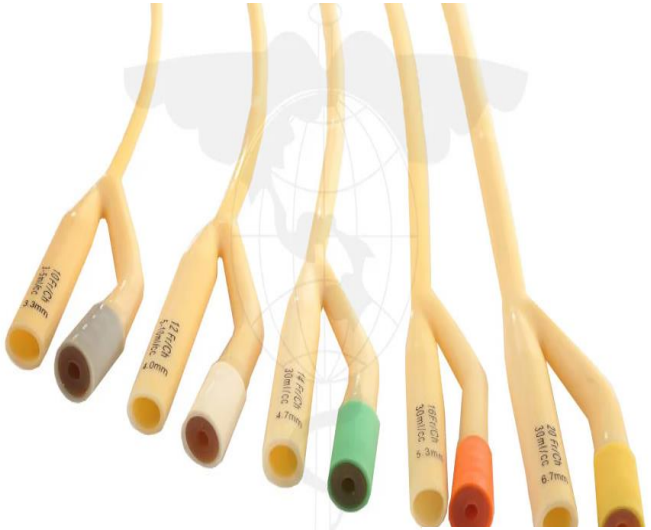
- If perforation/peritonitis exists, patient is unstable, nonoperative reduction is unsuccessful, or lead point is identified, proceed to surgical reduction.



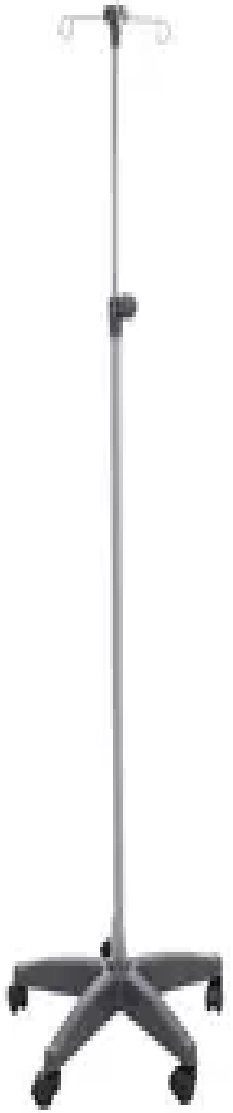


- There are a variety of protocols that have been suggested with some advocating 3 attempts lasting 3 minutes. Success is achieved when there is reduction of the 'mass' and air or contrast refluxes into the terminal ileum. Reduction is less likely to be successful if: there is associated small bowel obstruction

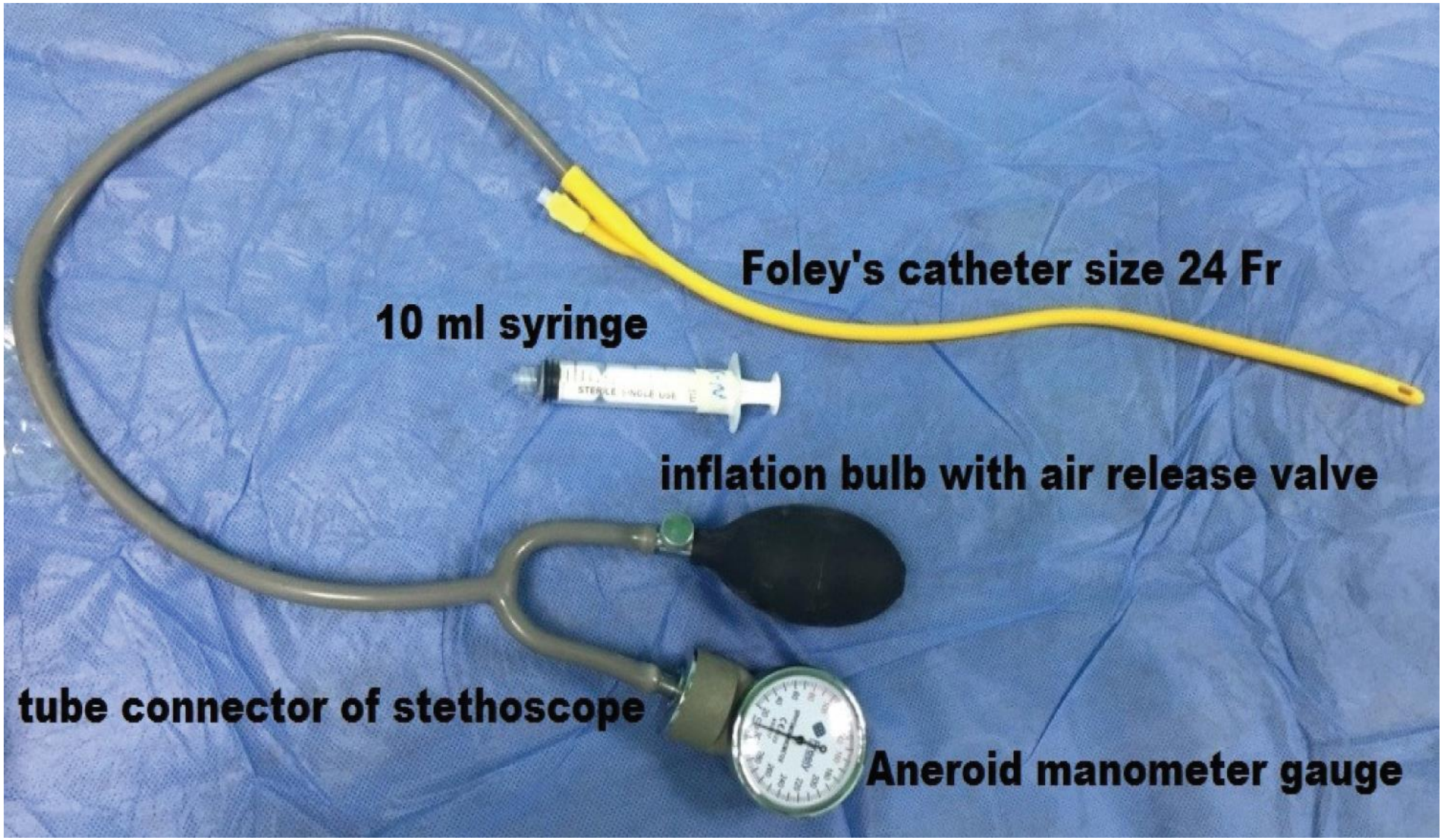

500 ml
SODIUM CHLORIDE(0.45% w/v)
& DEXTROSE (5% w/v)
INJECTION IP
SALDEX -0.45




ZINC OXIDE
ADHESIVE PLASTER

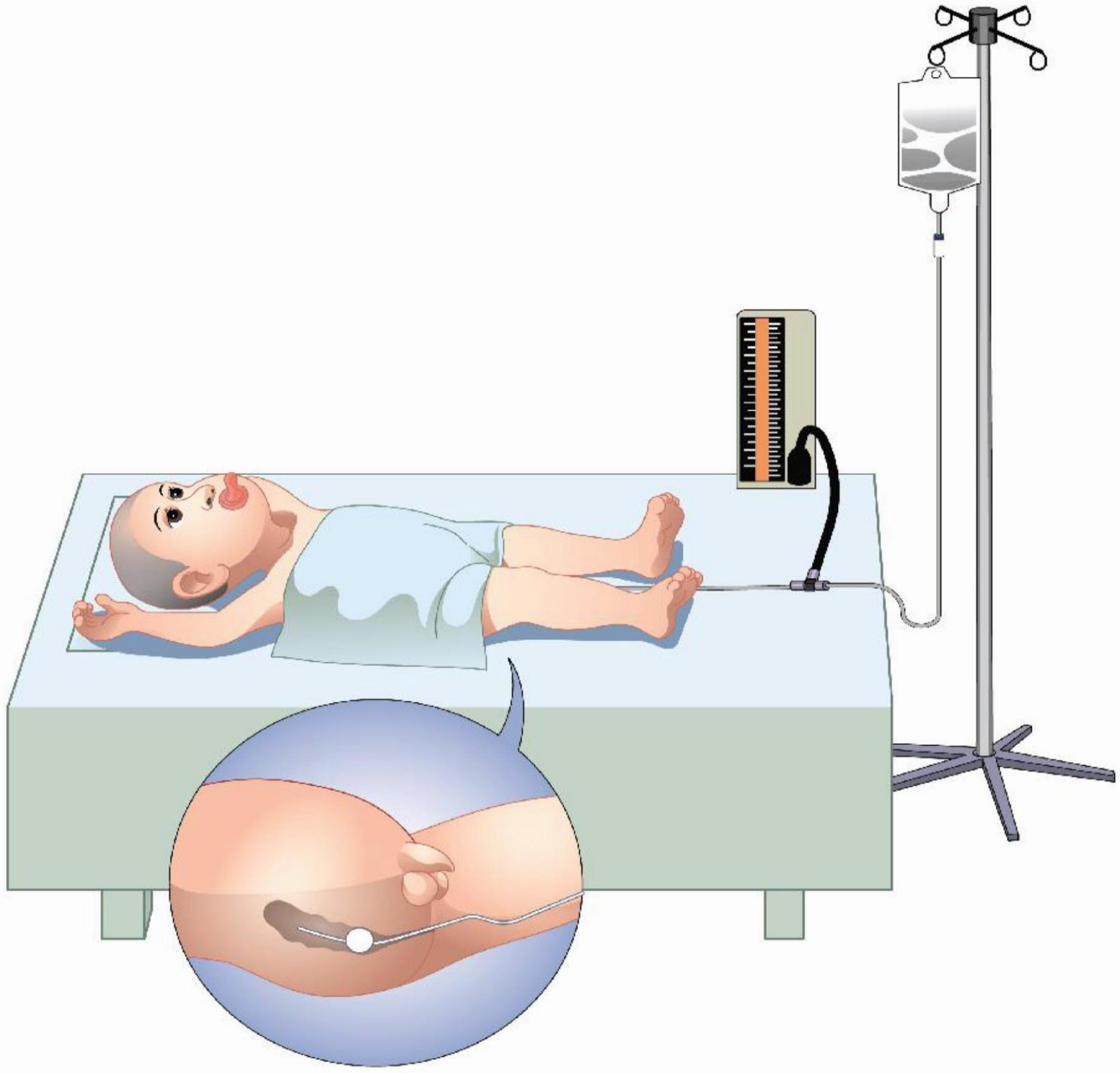


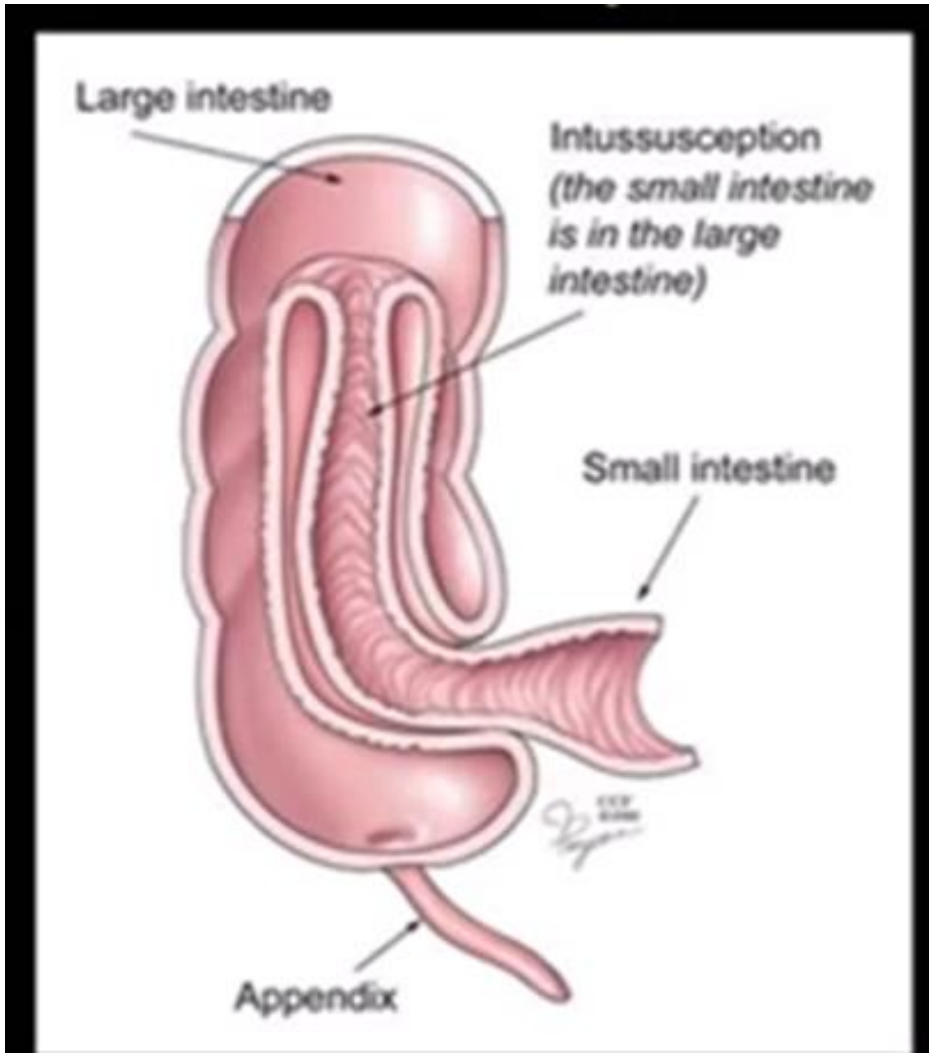

SUPERMAX
STERILE
POWDERED LATEX SURGICAL GLOVES
SIZE
LOT

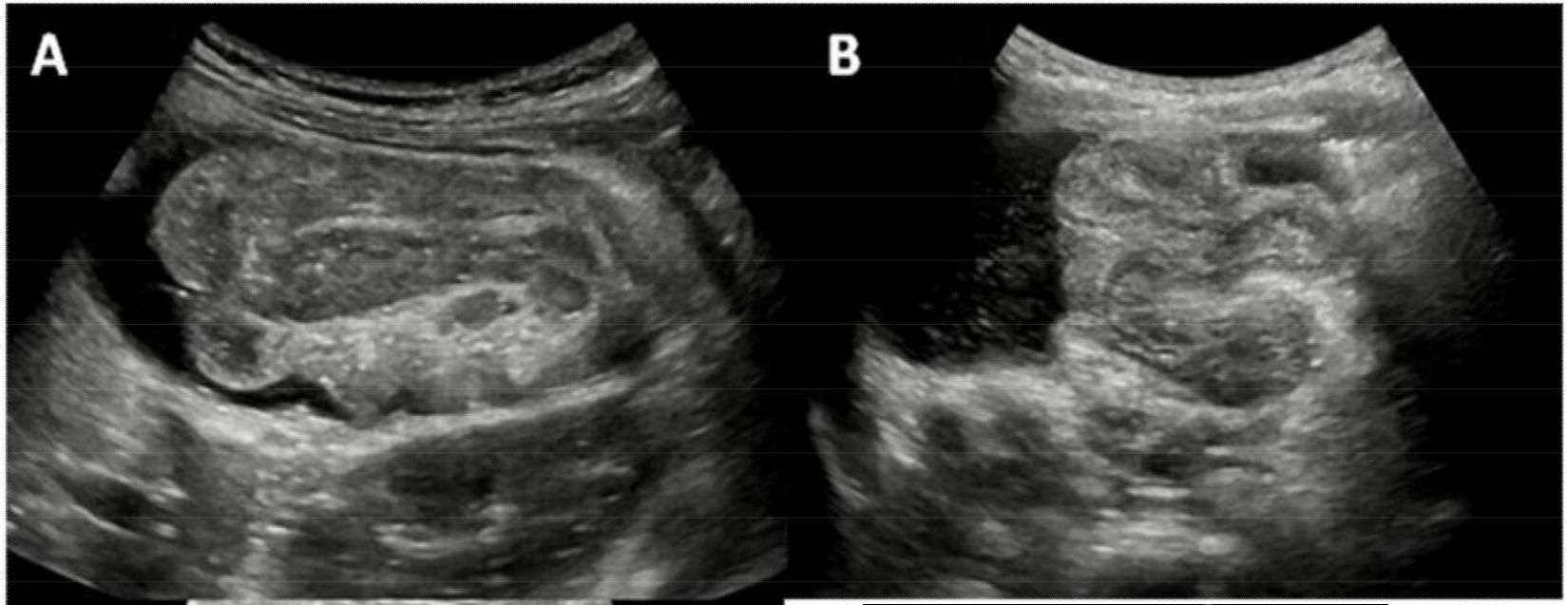

Foley's catheter size 24 Fr
10 ml syringe
inflation bulb with air release valve
tube connector of stethoscope
Aneroid manometer gauge

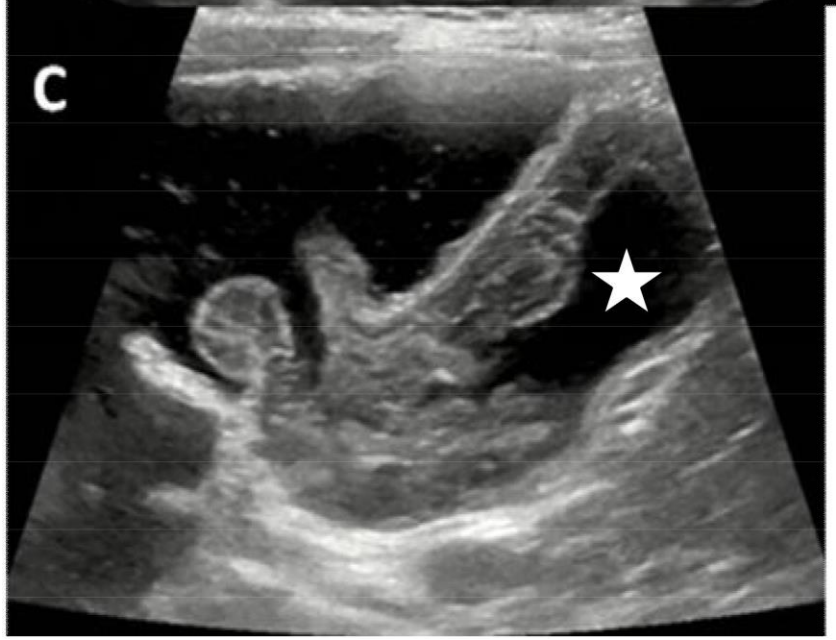
- In air-reduction and water-reduction methods, a catheter is inserted into the rectum of the child, and under fluoroscopic guidance, air or water is instilled into the large bowel.

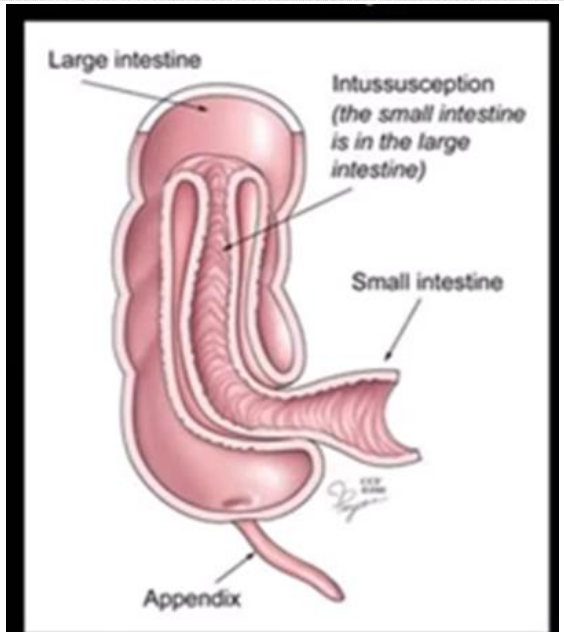
Sedation

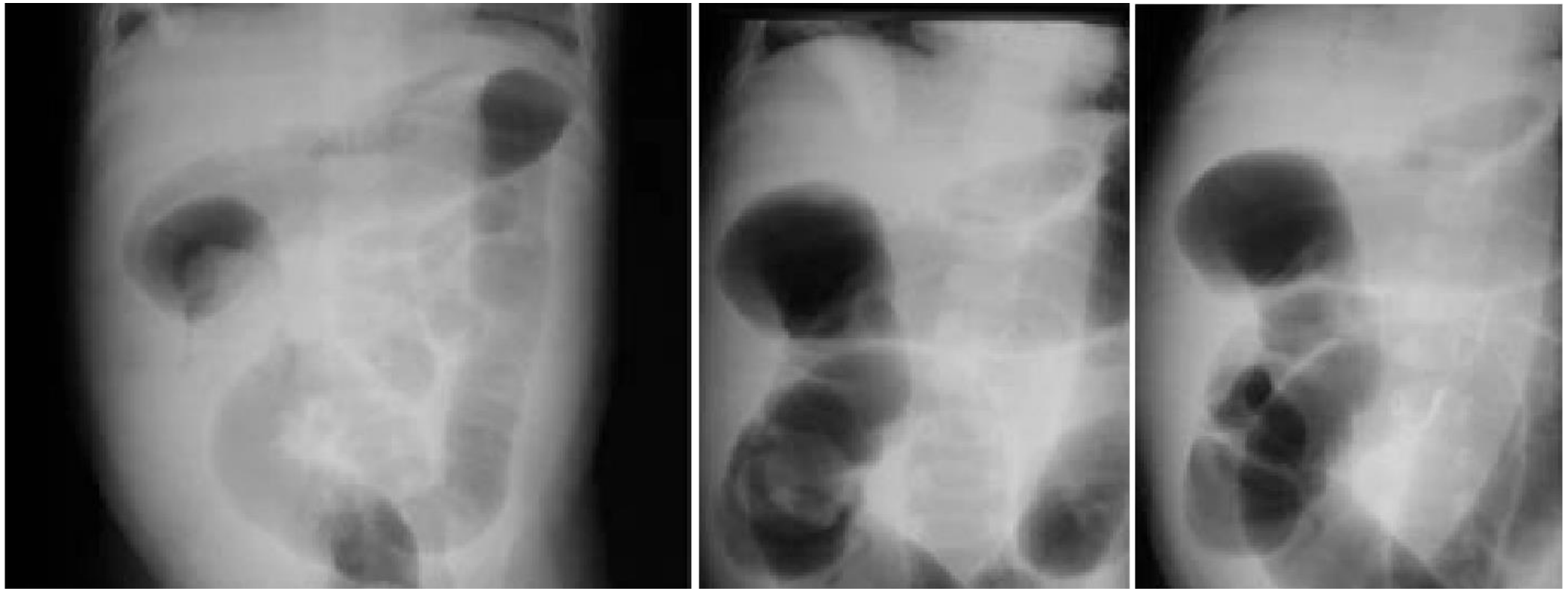


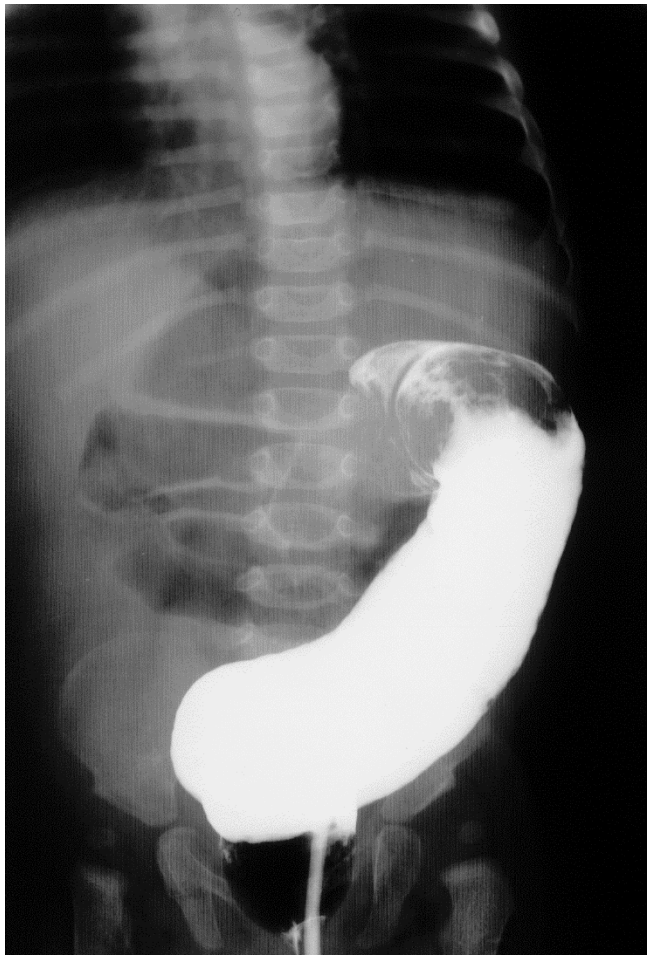

Large intestine
Intussusception
(the small intestine
is in the large
intestine)
Small intestine
Appendix

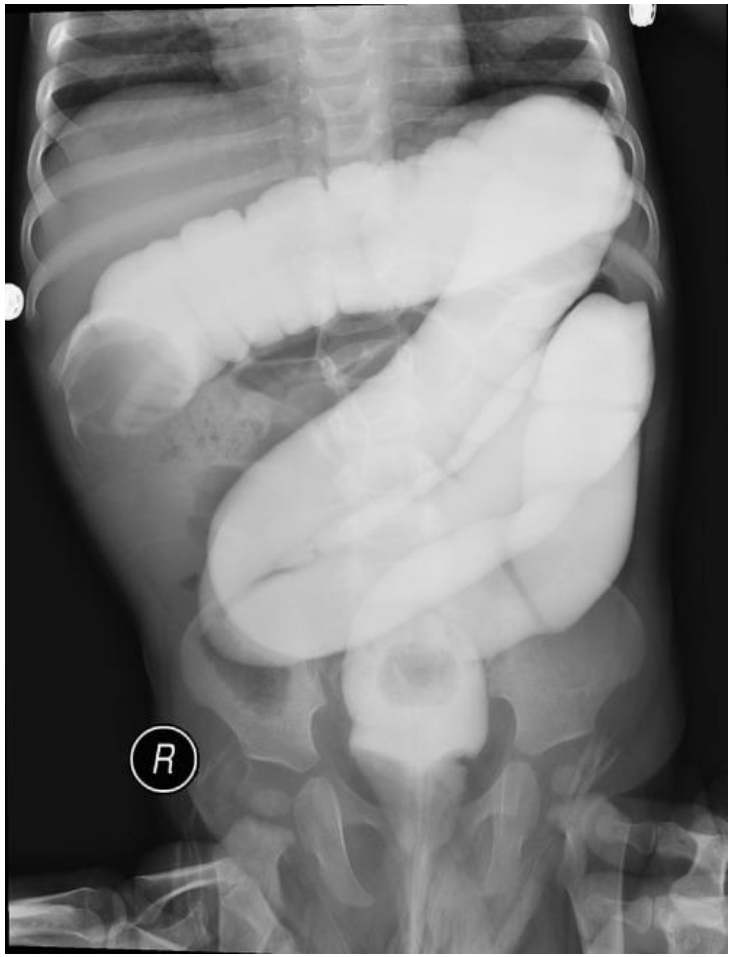

A
B

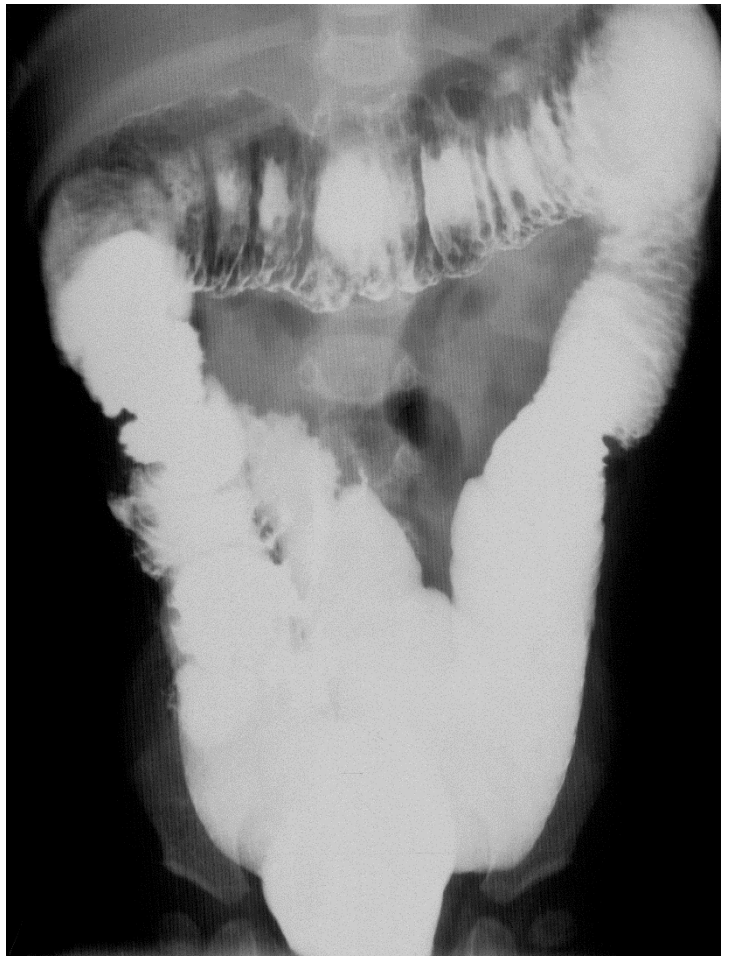

C


Large intestine
Intussusception
(the small intestine
is in the large
intestine)
Small intestine
Appendix






R



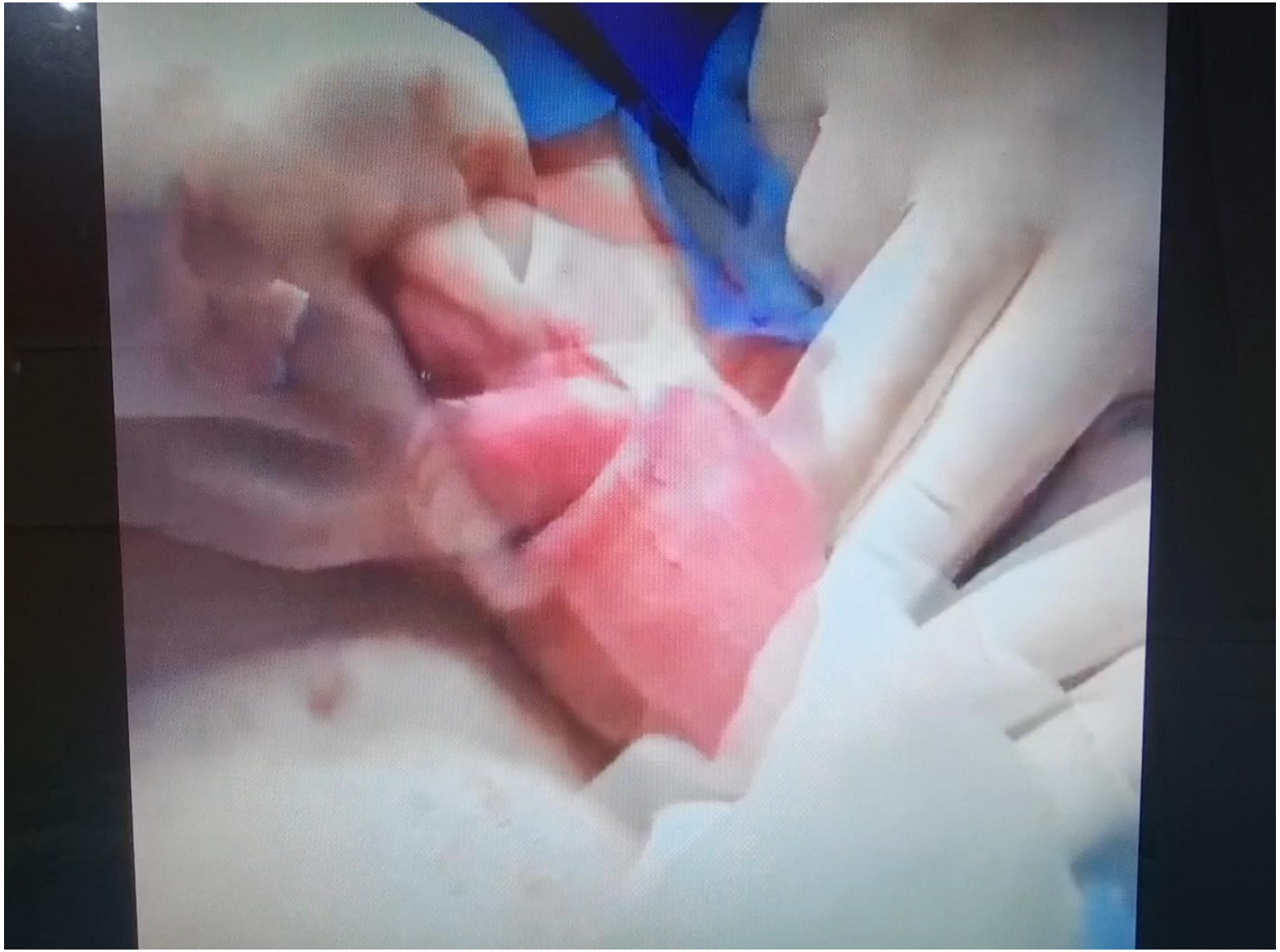
Complications

- perforation:
  - it is the main risk of reduction, but since without radiological reduction, an operation is required, this risk is worth taking
  - rectum is the most likely portion of the bowel to perforate, so it is important to monitor the diameter of the rectum during the procedure rather than just concentrating on the position of the intussusception
- recurrence:
  - may occur in up to 10%, often within 3 days
  - repeat imaging-guided reduction is advised but should not be attempted more than 3 times

- Reduction is less likely to be successful if:
- there is associated small bowel obstruction
- over 24 hours of symptoms????
- lethargy

Treatment in adults,

- Laparotomy or laparascopic reduction is usually required, as the lead point often requires resection



از توجه شما سپاسگزارم