BY THE NAME OF ALLAH THE MOST GRACIOUS THE MOST MERCIFUL

Intestinal Obstruction

د . أحمد اسامة حسن

Specialist in General Surgery and Laparoscopic Surgery

To be read in
Bailey & Love's Short Practice of Surgery 26th Edition.

Ch 70 (1181 - 1198)

OBJECTIVES

- Concept of Intestinal Obstruction.
- Classification.
- Assessment & Evaluation.
- Interpretation of Imaging.
- How you can deal with such a case.
- Clinical Solved Problems.
- Follow Up.

DEFINITION

-It is a state of impairment of normal peristaltic transmission or evacuation of bowel contents or both.

- *Result* : (1) Accumulation of bowel content with propulsve evacuation (Vomitus).(Proximal).

Or (2) bowel distention (Middle), leading to Midline pain with subsequent (1).

Or (3) Constipation (Distal) with subsequent (2),then (1).

- It is an Acute Abdomen State.

Pathophysiology

Mechanical I.O.

Proximal to Obstruction

-Proximal peristalsis started to increased to over come the obstruction.

- If the is not relieved , the bowel continues to dilate.

- Ultimately , there is reduction in peristaltic strength resulting in flaccidity and peristalsis.

- Proximal distention is due to (gas and fluid).

Pathophysiology cont.

-Next dehydration and electrolytes imbalance started to develop.

- At the end Bacterial transmigration will ensue due to decrease bowel wall immunity.

- Exudates would pass out of the bowel into the sac or peritoneal cavity.

- The bowel may blow out due to increase intraluminal pressure and sloughed bowel wall (Focused ischemia).

Pathophysiology

Distal to Obstruction

- The bowel which is distal to the obstruction exhibits normal peristalsis and absorption until it becomes empty and collapse.

Pathophysiology

Functional I.O.

-Electrolytes Disturbance.

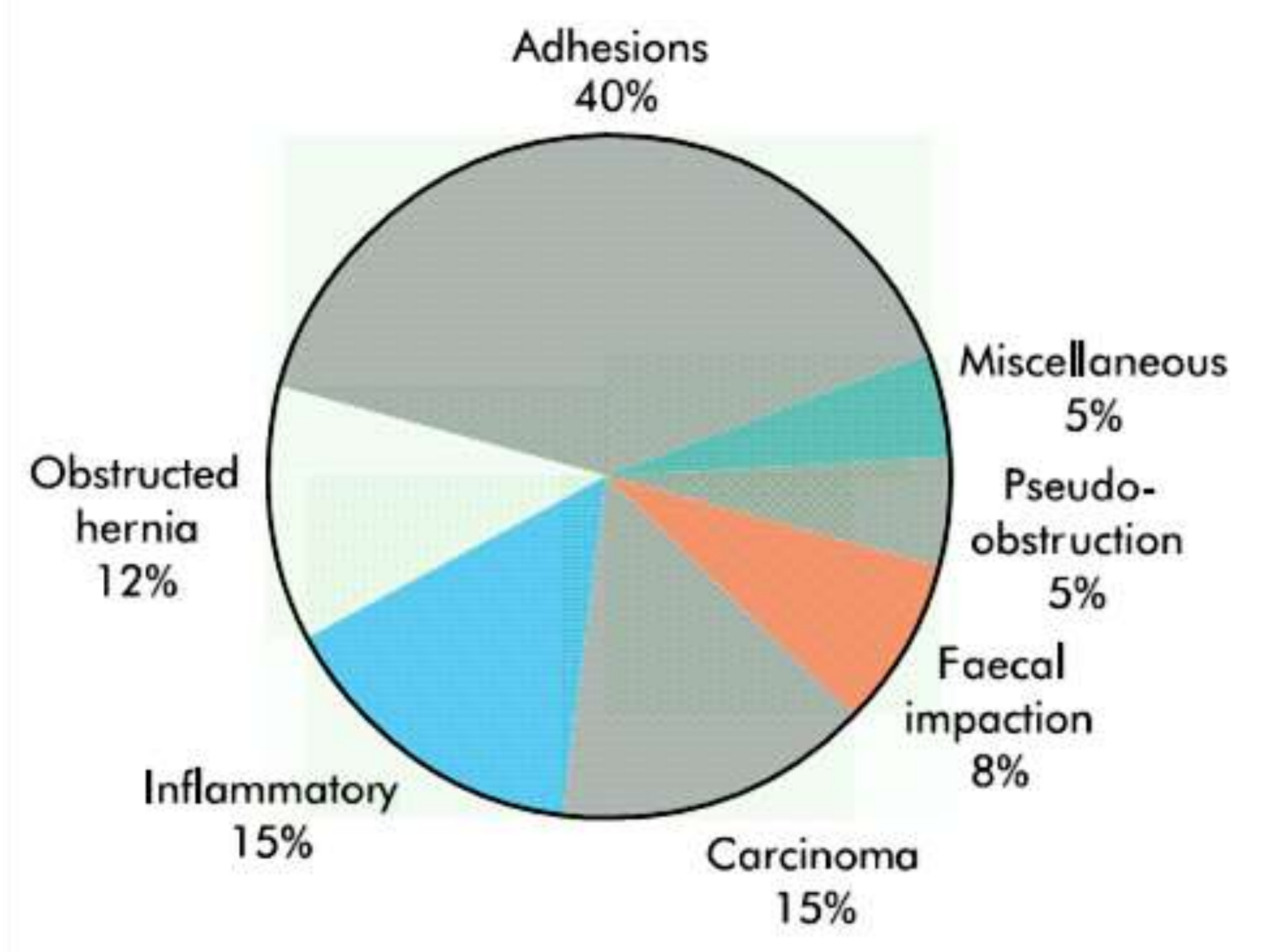
-Post-Operative.(Type of surgery).

- Vascular deprivation: (Mesenteric Vascular Occlusion).
- Drugs (anticholinergics, Anasthesea).
- Metabolic .
- Neuronal.
- Myopathies.

CONTINUE

Classified into:

- Dynamic I.O. (Mechanical):
  - IntraLuminal.
  - IntraMural.
  - ExtraMural.
- Adynamic I.O. (Functional).


Adhesions
40%
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5%
Pseudo-
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Faecal
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Carcinoma
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Inflammatory
15%
Obstructed
hernia
12%

WORK UP

- Assessment

(History, Examination and Investigation).

YOU HAVE TO REACH THE DIAGNOSIS.

Which type of obstruction and you have to define the cause.

- Resuscitation (Emergency).
- Evaluation

(Assessment with suitable Treatment considering anesthesia).

HISTORY (Symptoms)

High Small

VOMITING (profuse) .
PAIN (mild)
Abdominal Distention (mild) .
Constipation

Low Small

PAIN (severe) .
Abdominal Distention (central) .
VOMITING
Constipation

Large Bowel

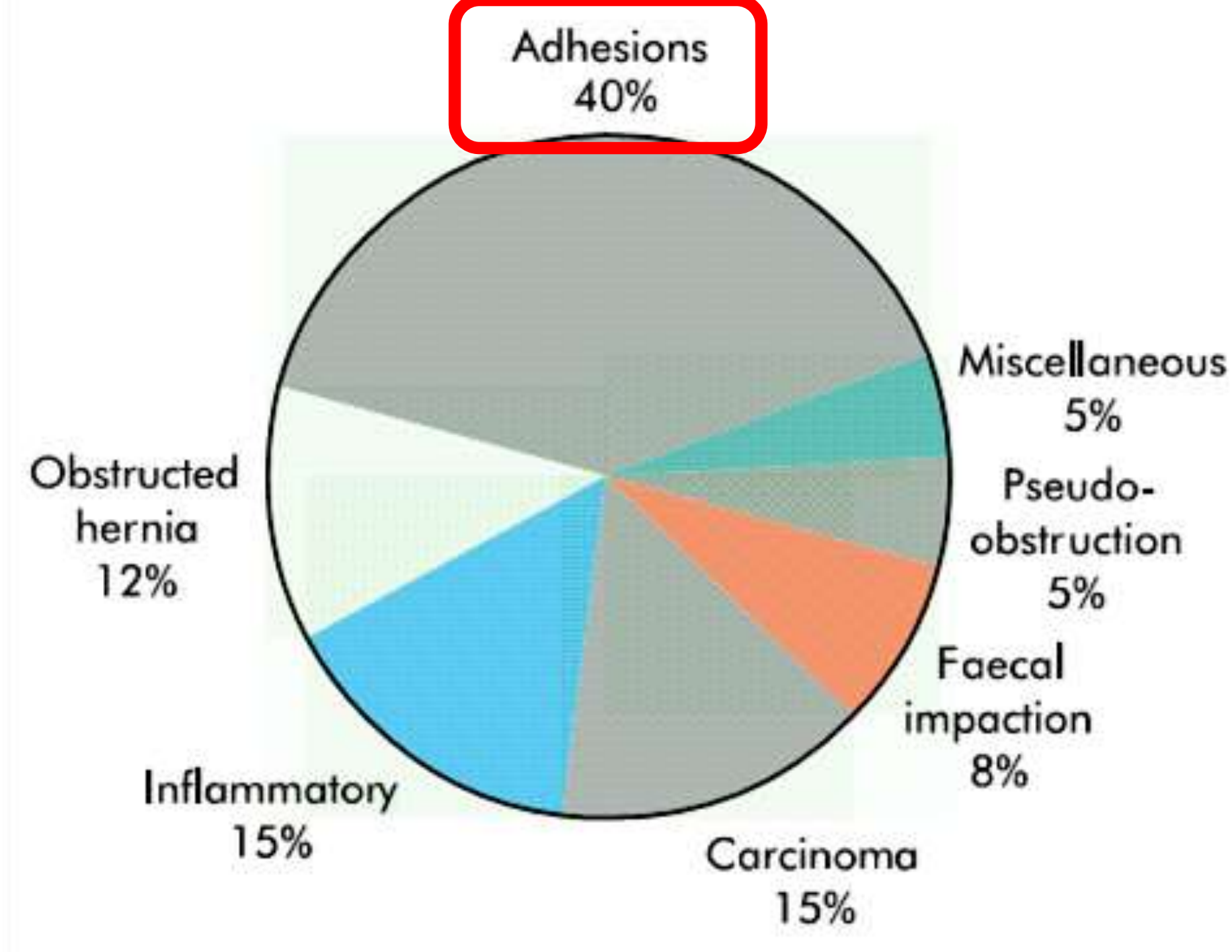
Constipation
PAIN (suprapupic) .
Abdominal Distention (segmental) +/- small B. dilatation
VOMITING (faecal)

EXAMINATION (SIGNS)

- Signs of Dehydration including vital signs.
- Signs of Electrolytes Disturbances.
- Abdominal Distension.
- Tense Abdomen.
- Tympanic on percussion.
- Bowel Sounds:

    (Aggressive / Exaggerated) = Dynamic O.

    (Sluggish / Absent) = A dynamic or dynamic with fatigability in late stage.
- L.N., Ascitis, Hernial Orifices.
- Per-Rectal Examination.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OBSTRUCTION BY ADHESION OR BAND

- The most common cause.

-It is common due to abdominal surgical operations.

- Two Types :

- Fibrinous **(Easy Flimsy)** : Early post-op. period, it would disappear when the cause is removed. The fibrin acts like a glue to seal the injury and builds the fledgling adhesion.

- Fibrous **(Difficult dense)** : If above becomes vascularized and replaced by mature fibrous tissue.

-It is due Peritoneal irritation.

- It usually involves lower small bowel, and almost never involve the large bowel.

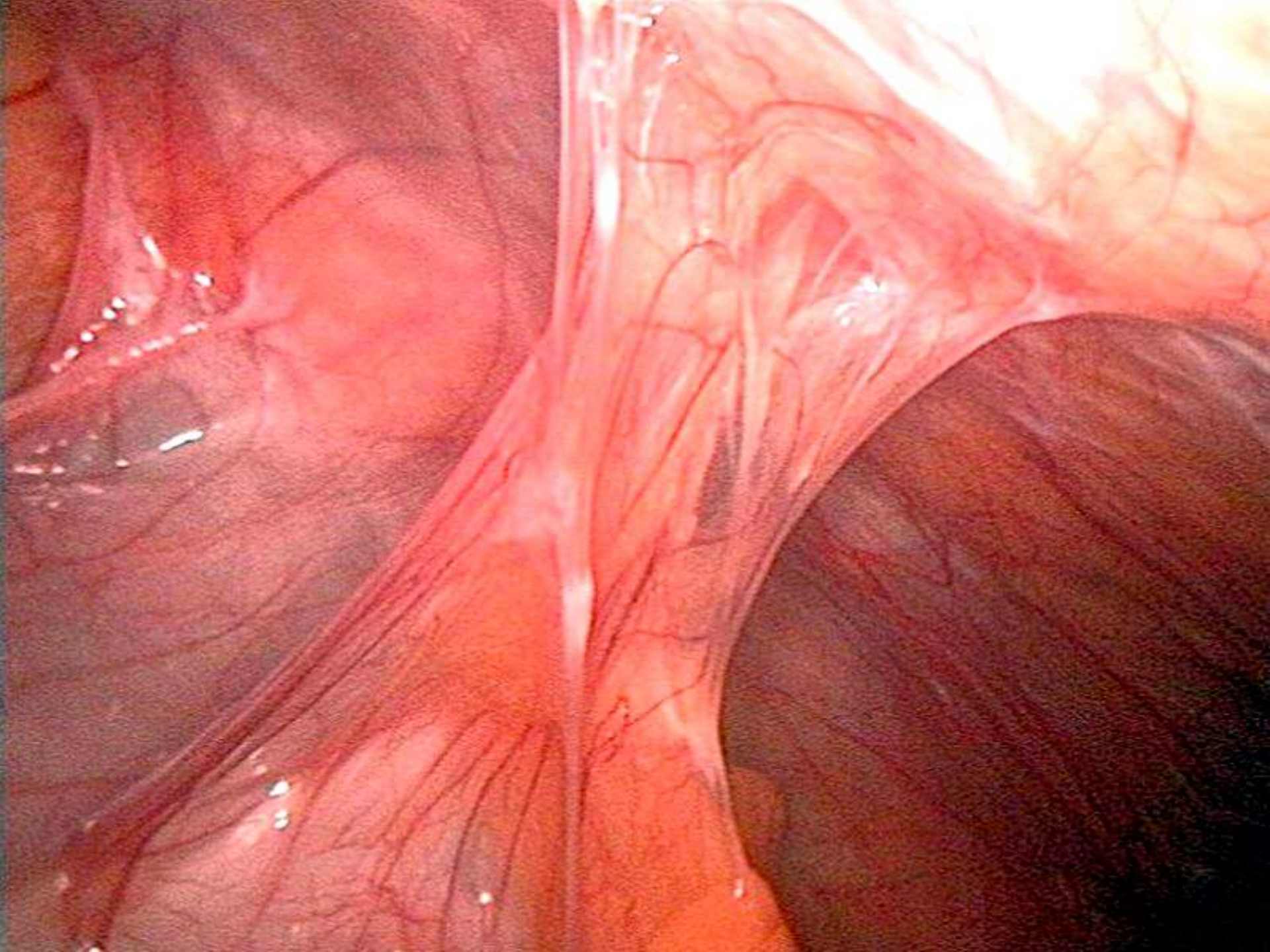


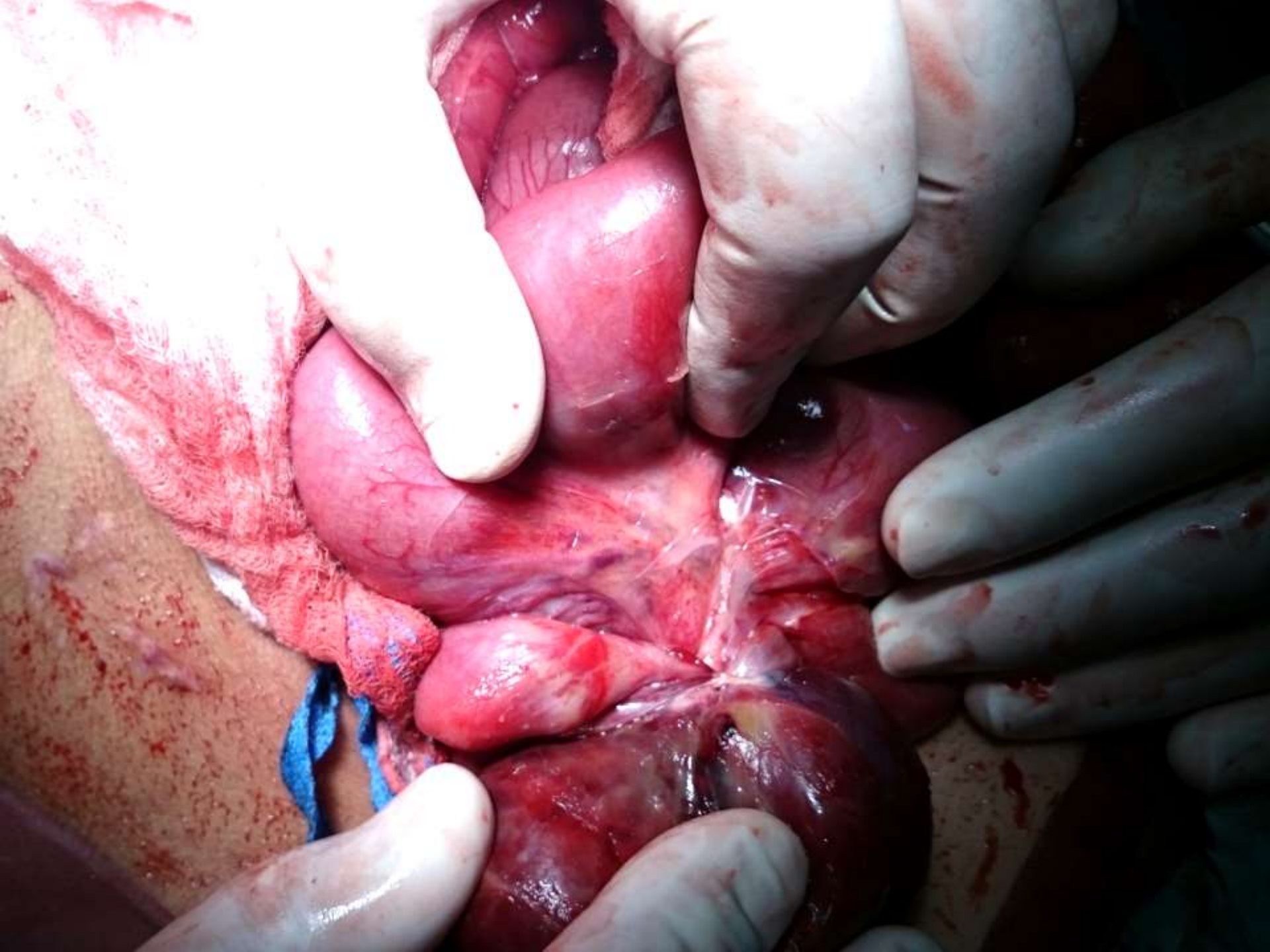
Table 70.1 The common causes of intra-abdominal adhesions.

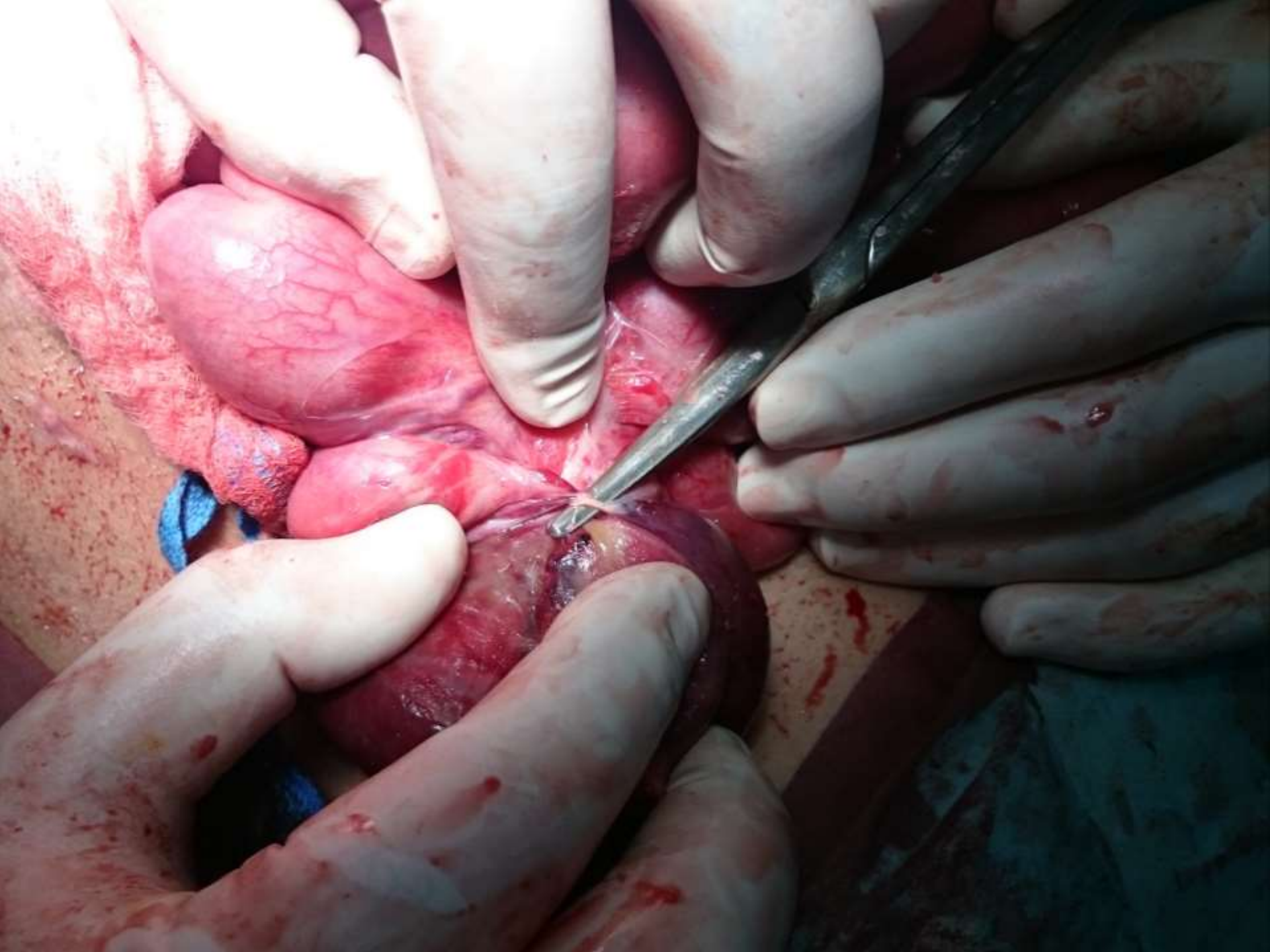
Acute inflammation	Sites of anastomoses, reperitonealisation of raw areas, trauma, ischaemia
Foreign material	Talc, starch, gauze, silk
Infection	Peritonitis, tuberculosis
Chronic inflammatory conditions	Crohn's disease
Radiation enteritis	

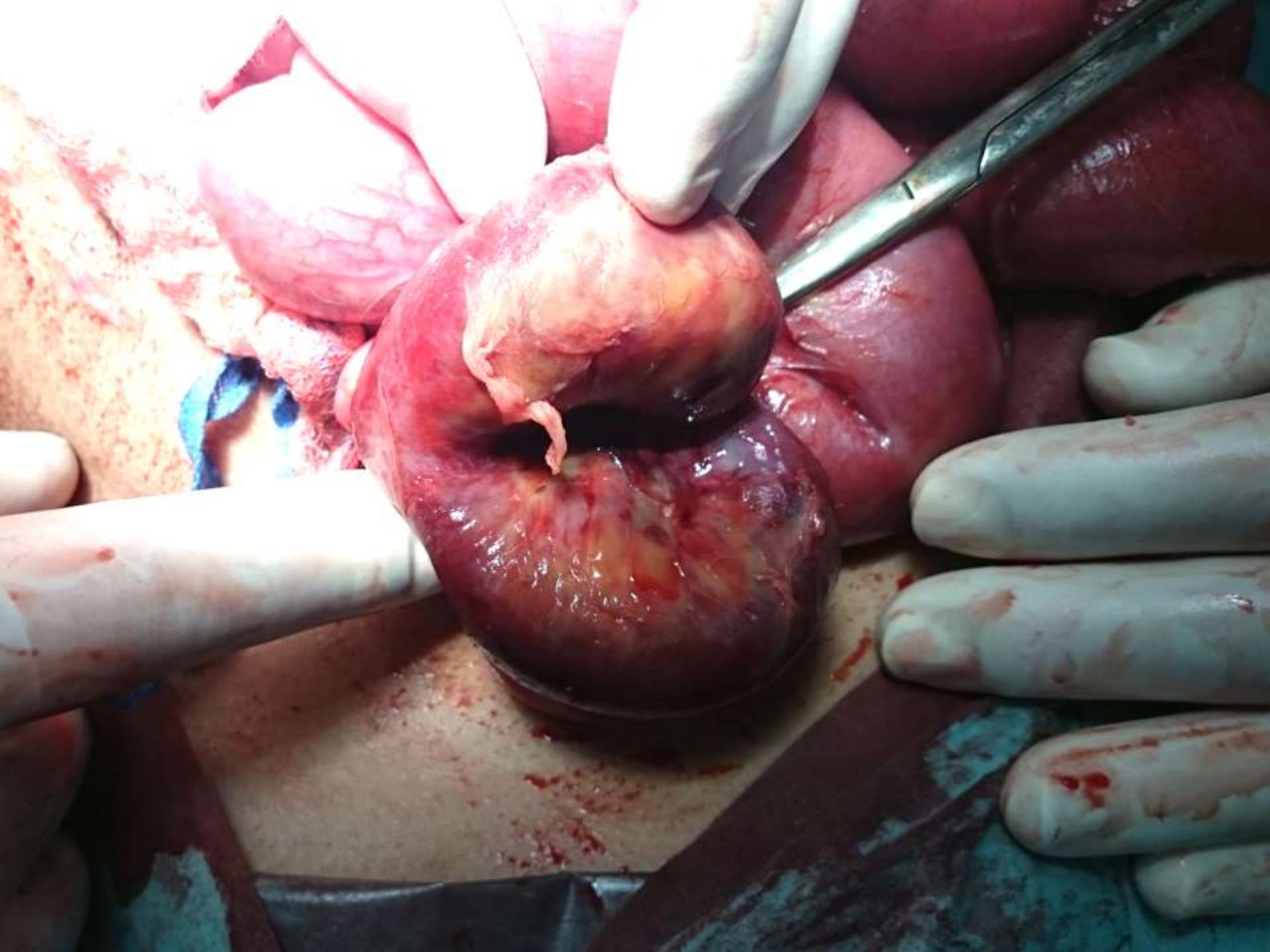
OBSTRUCTION BY BAND

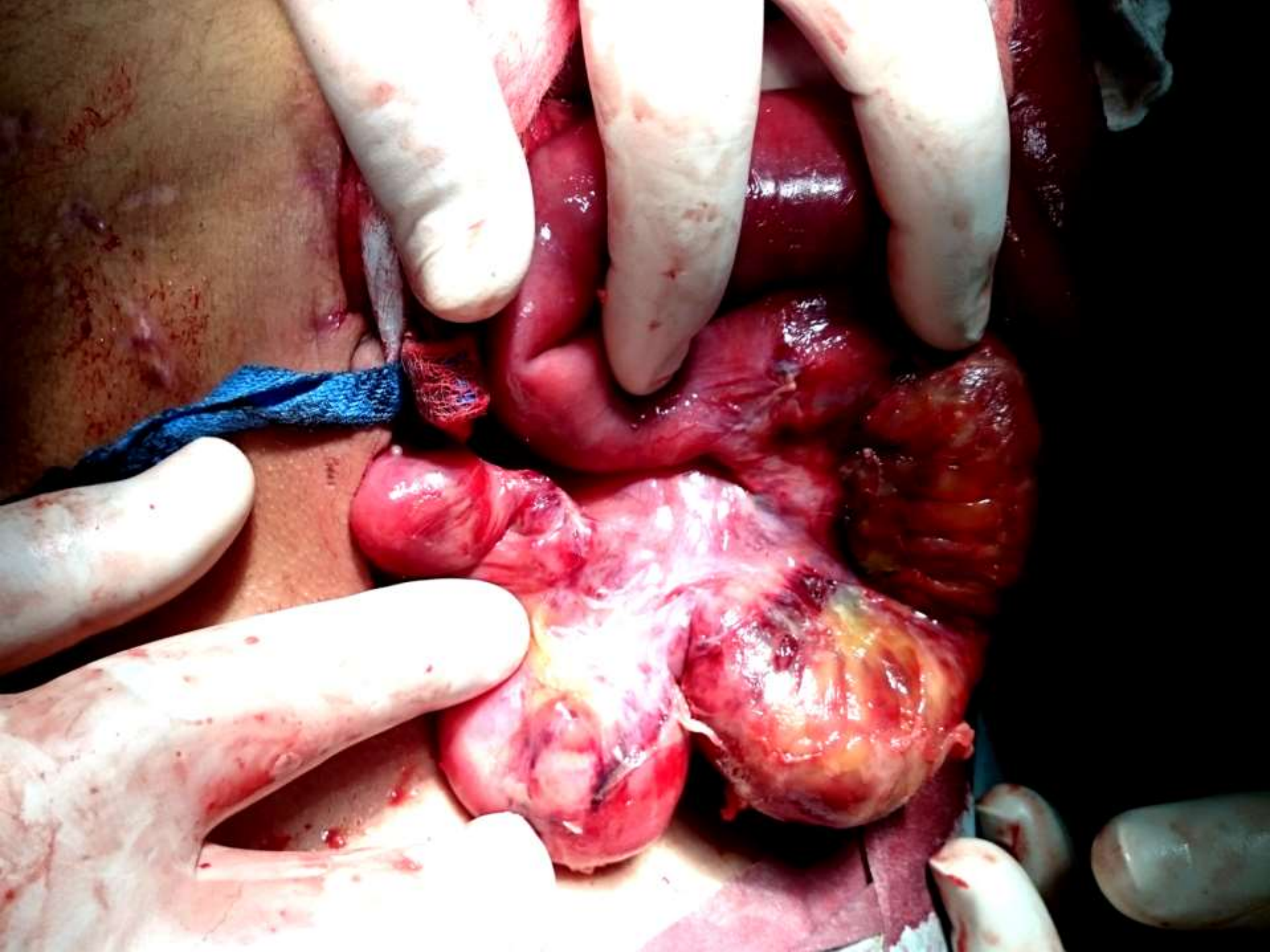
-Band is a fibrous stalk of a peritoneal tissue attaching the bowel to the abdominal wall .

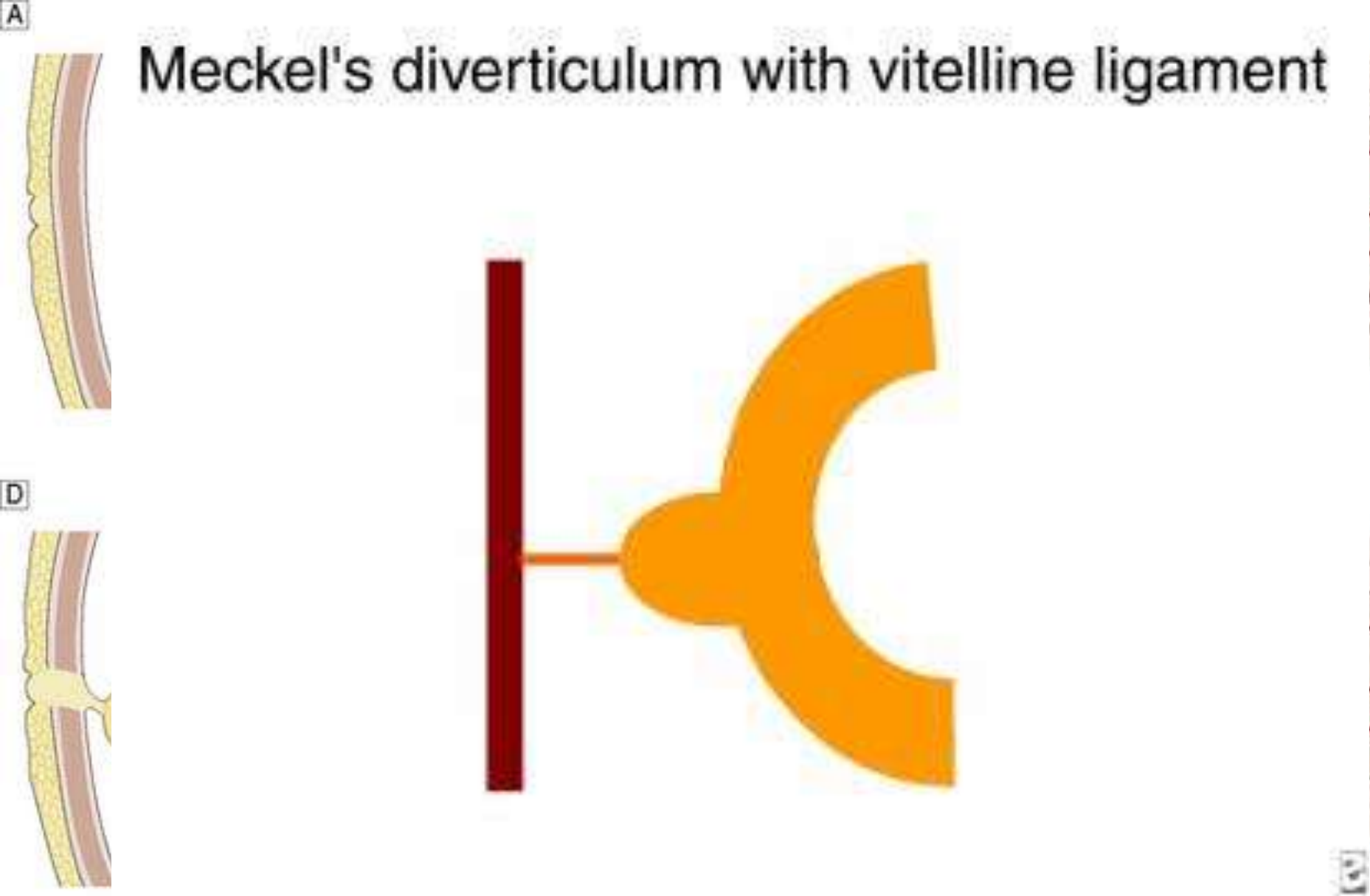
- Types:
  - Congenital: Obliterated vitello-intestinal duct, Band of Ladd.
  - String band following previous peritonitis (bacterial or inflammatory).
  - Portion of G. omentum , usually adherent to the parietes.
- Treatment : Surgical incision.



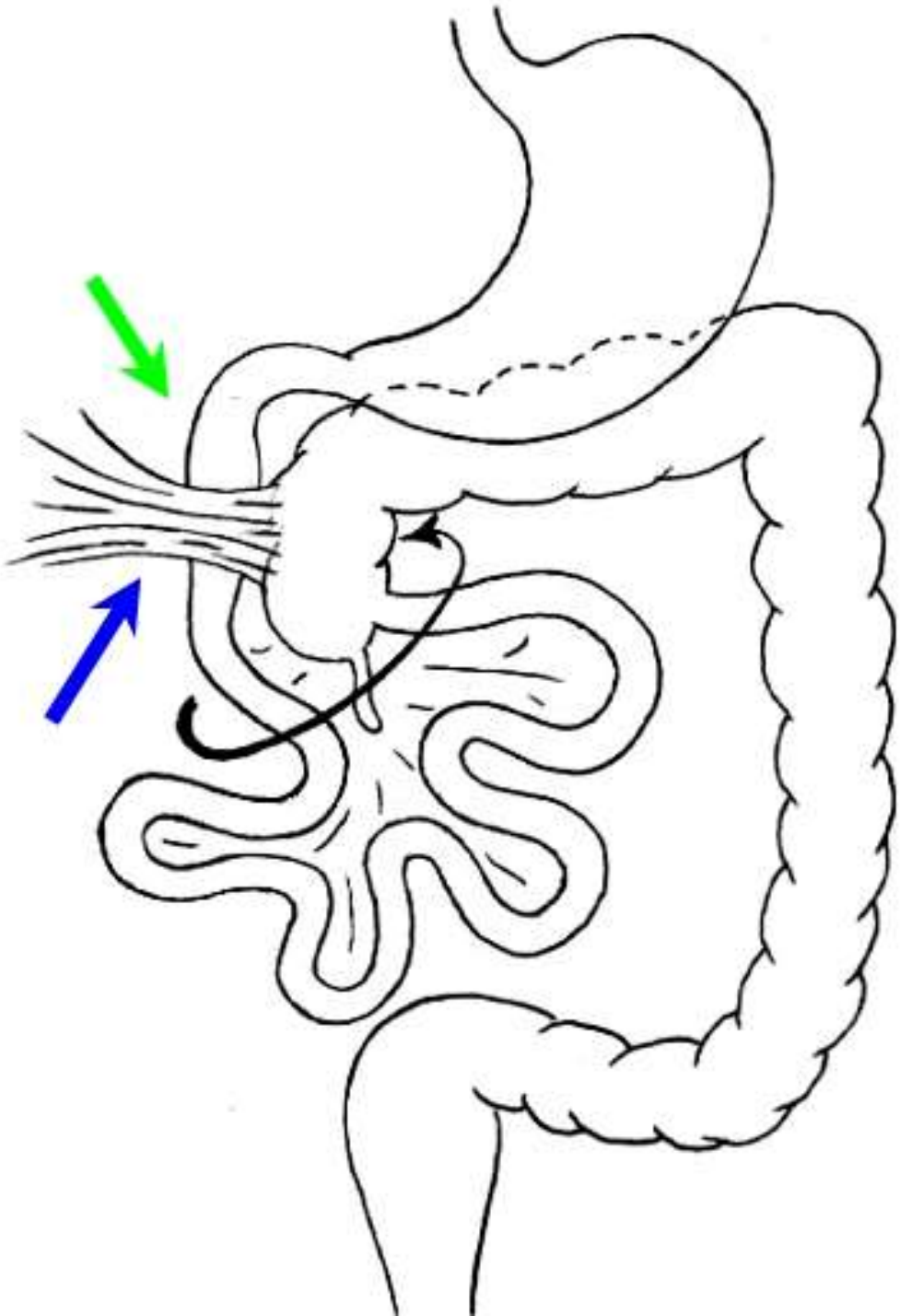


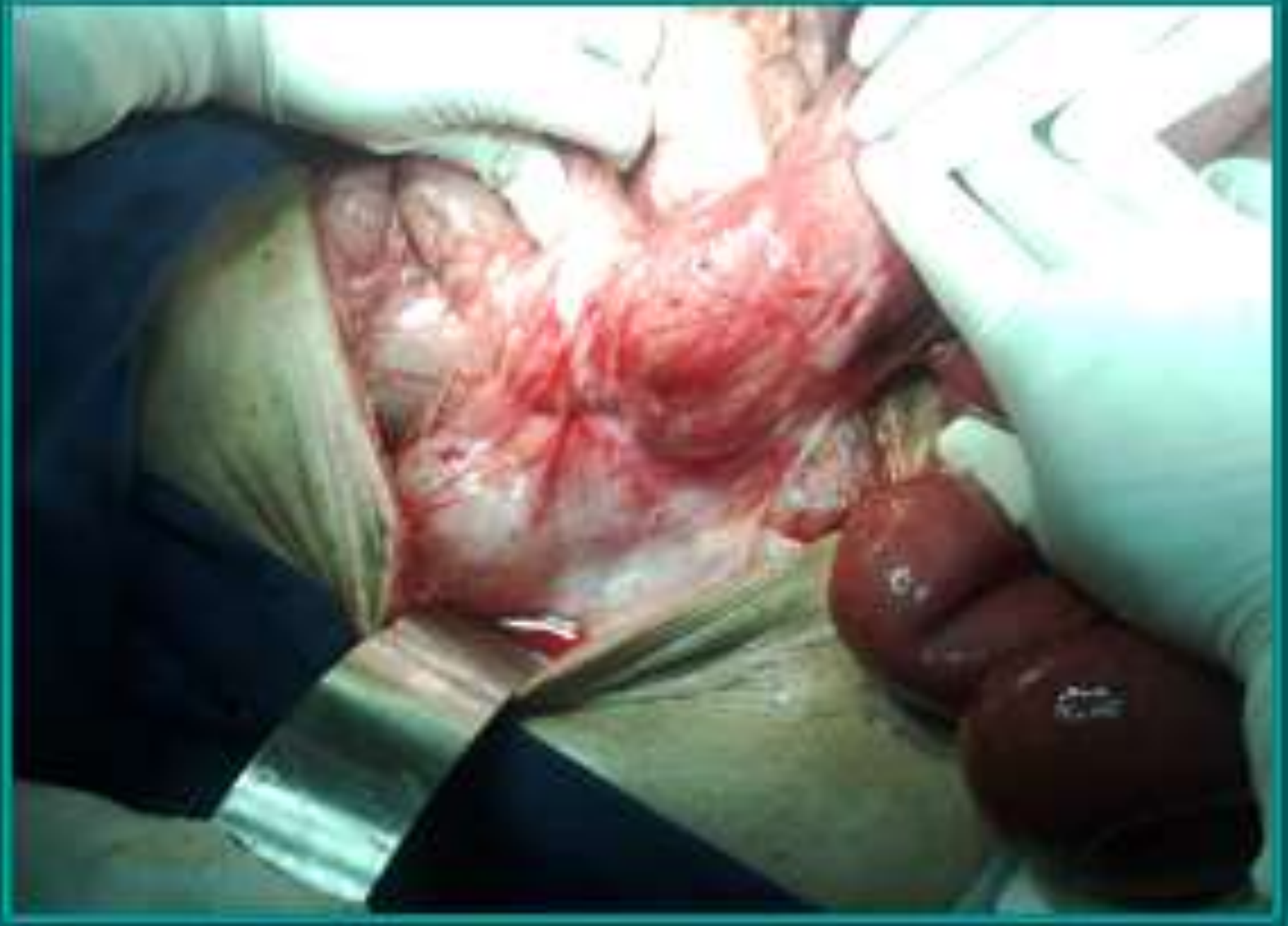


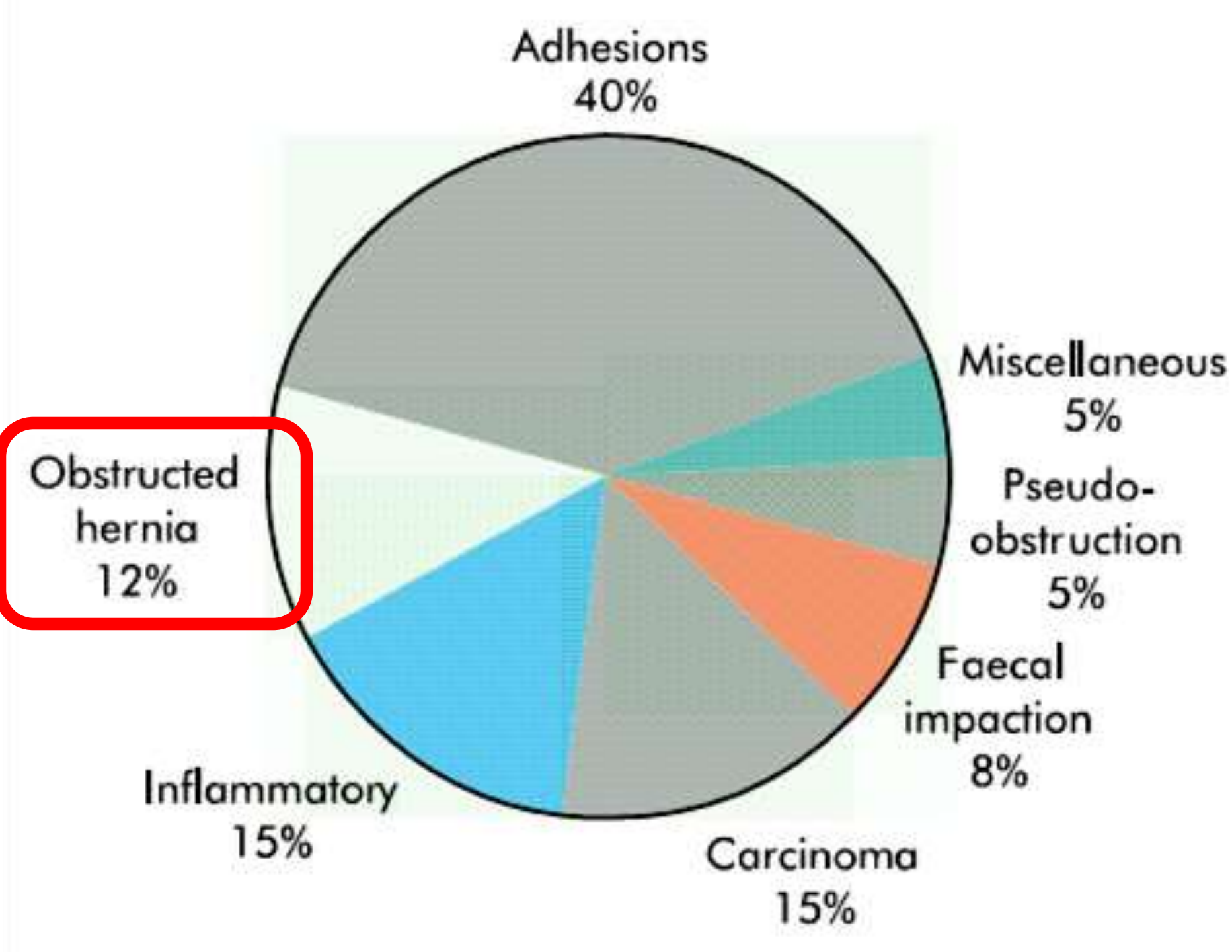




Persistence of the vitello-intestinal duct, giving rise to developmental abnormalities.
A A Meckel's diverticulum. **B** A fibrous cord to the ileum. **C** An umbilical intestinal fistula. **D** An enterocystoma. **E** An umbilical sinus. **F** An enteroteratoma.



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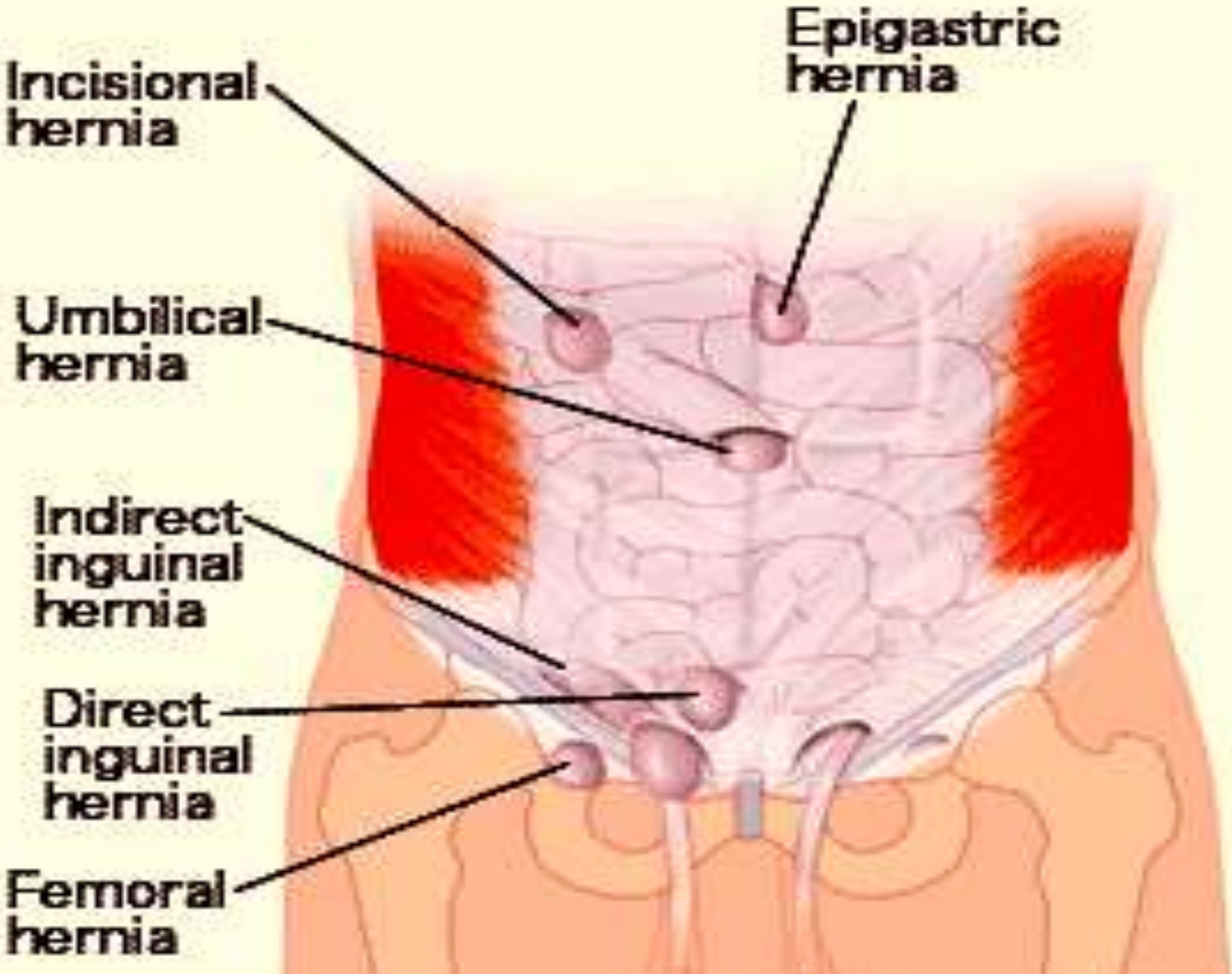
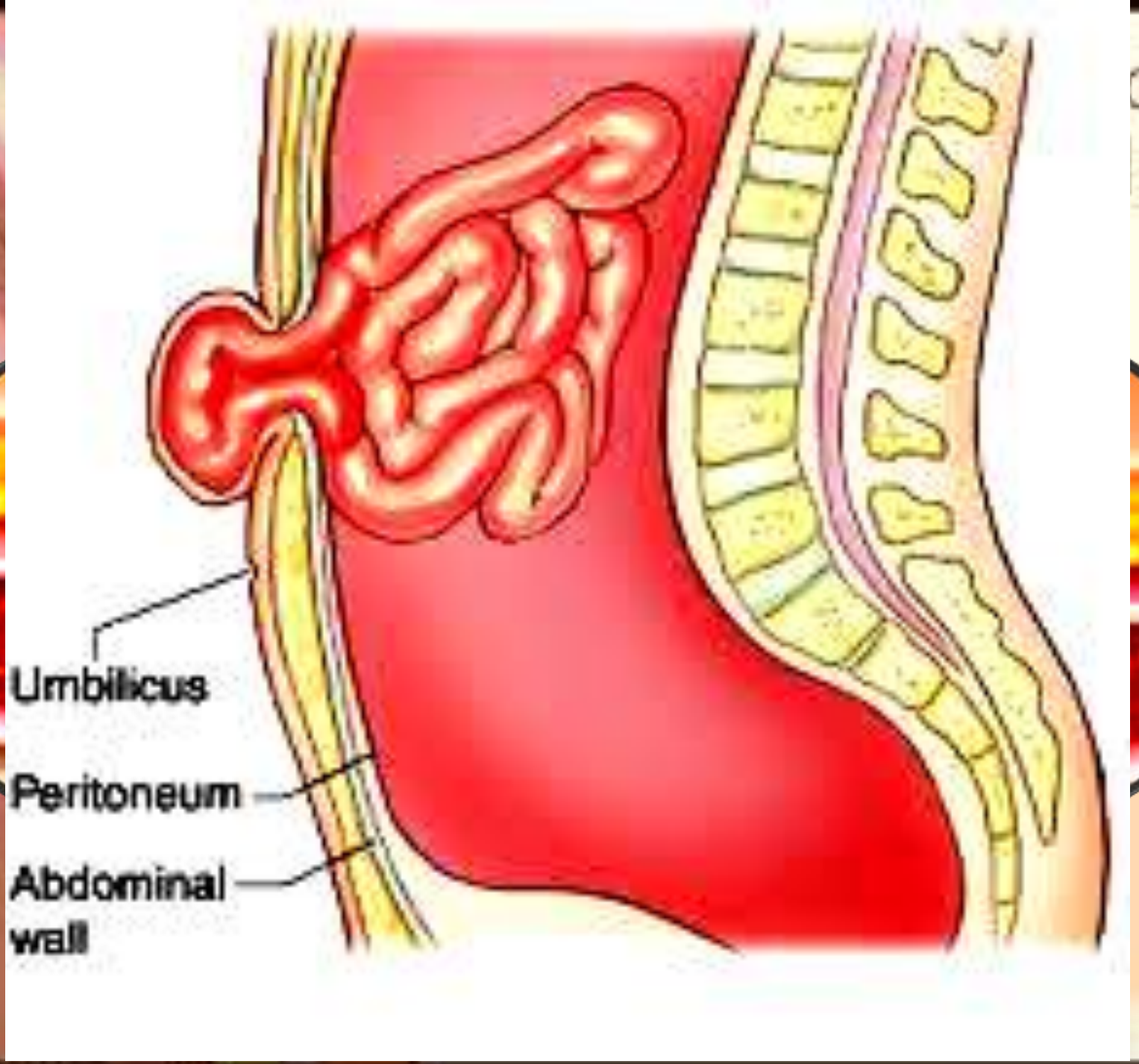
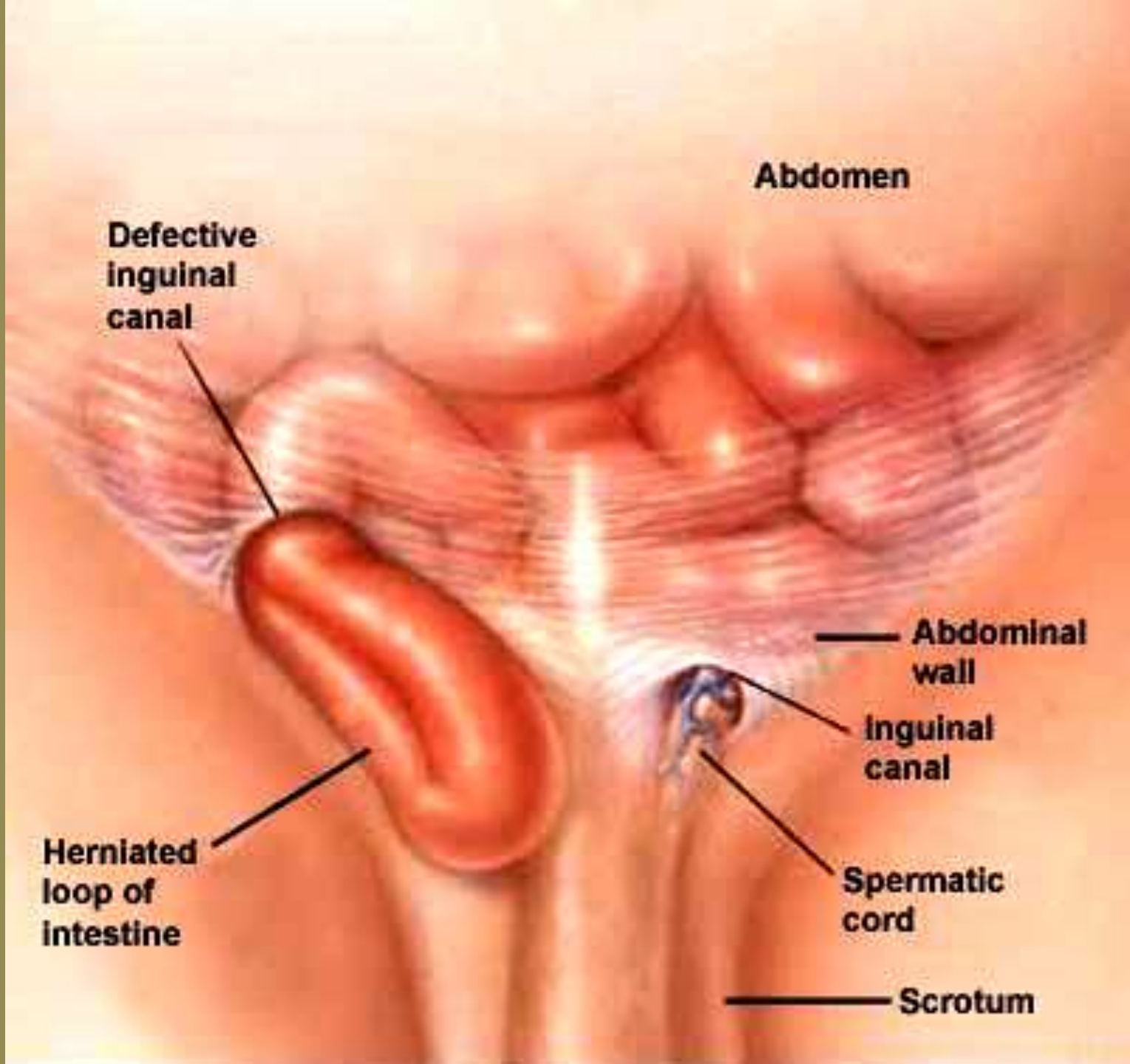
HERNIA (EXTERNAL , INTERNAL)

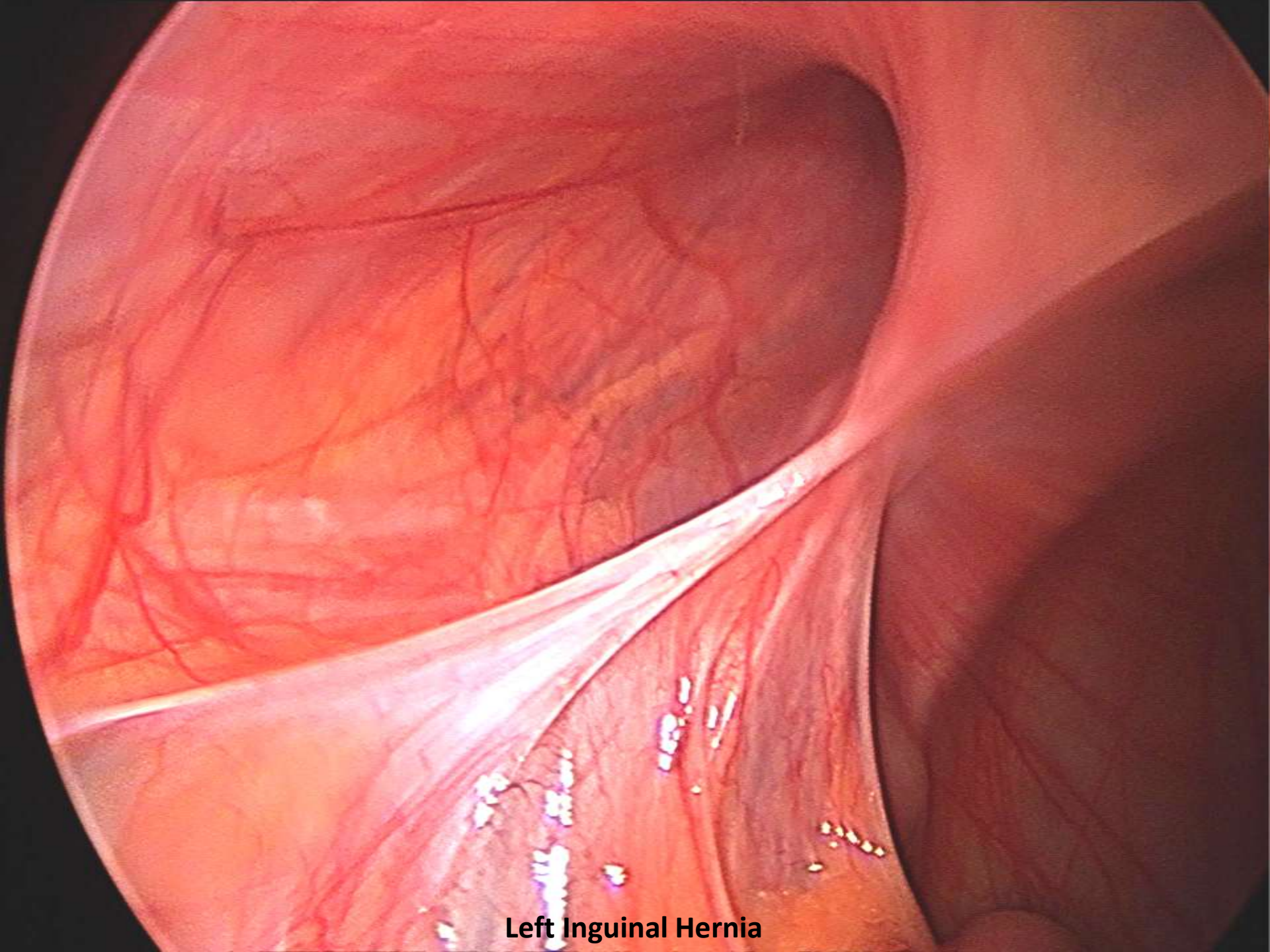
External Hernia

- Normal Hernia Orifices.
- Extra-luminal.
- Depends on the level.
- Compound (Two component).
- Incarciration.
- Obstruction
- Strangulation.

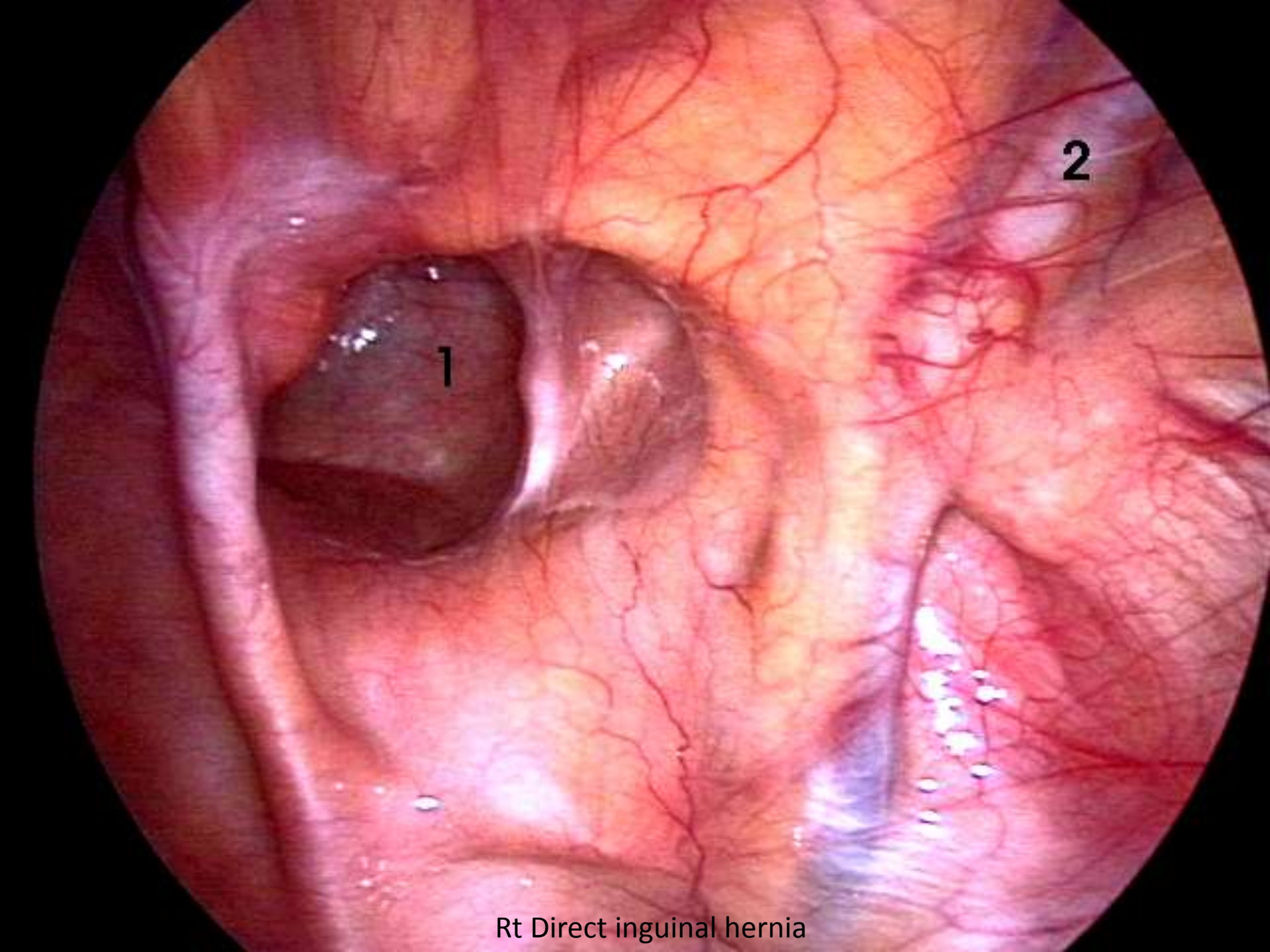

Incisional hernia
Epigastric hernia
Umbilical hernia
Indirect inguinal hernia
Direct inguinal hernia
Femoral hernia


Umbilicus
Peritoneum
Abdominal wall

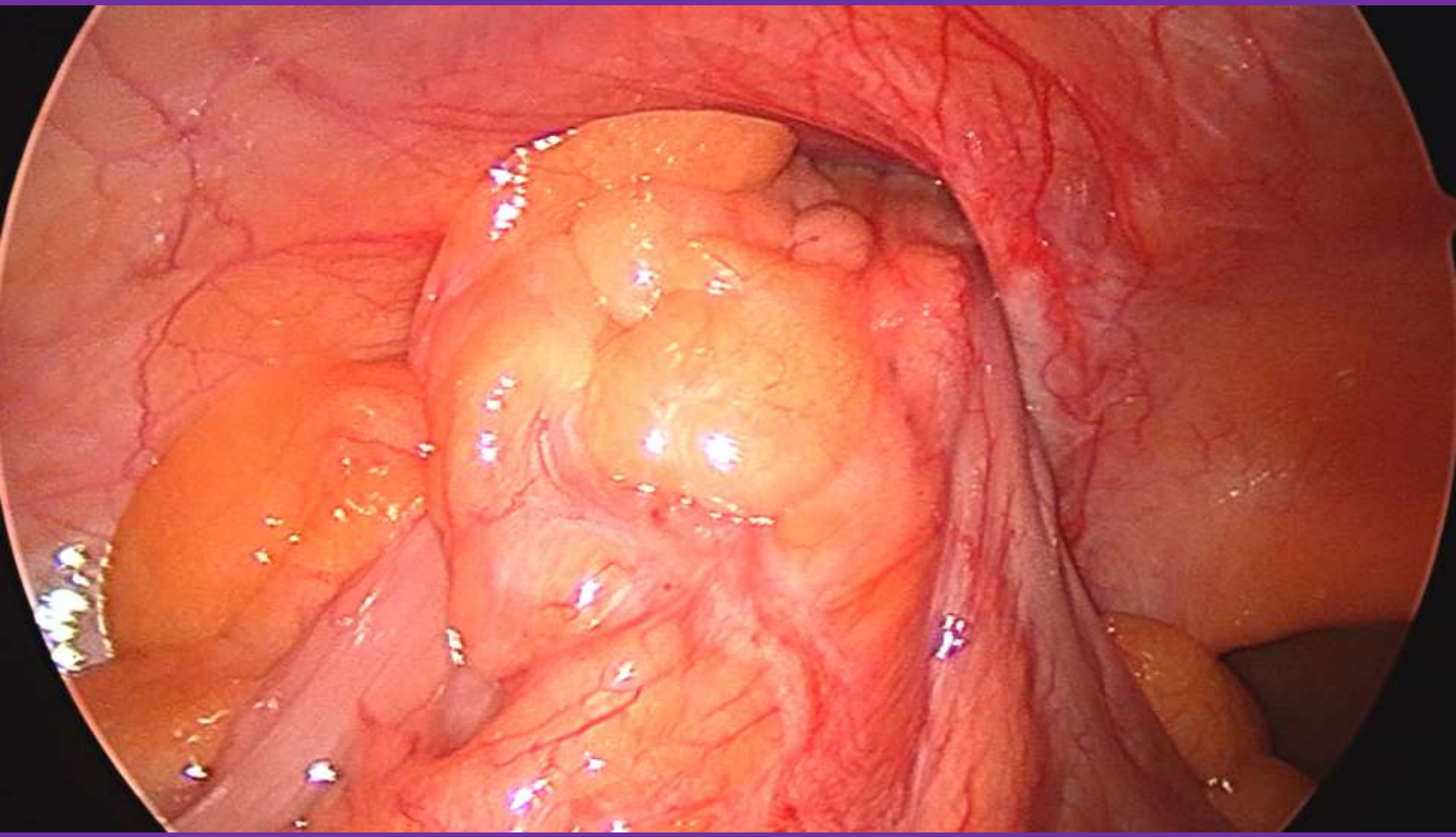

Abdomen
Defective inguinal canal
Abdominal wall
Inguinal canal
Herniated loop of intestine
Spermatic cord
Scrotum



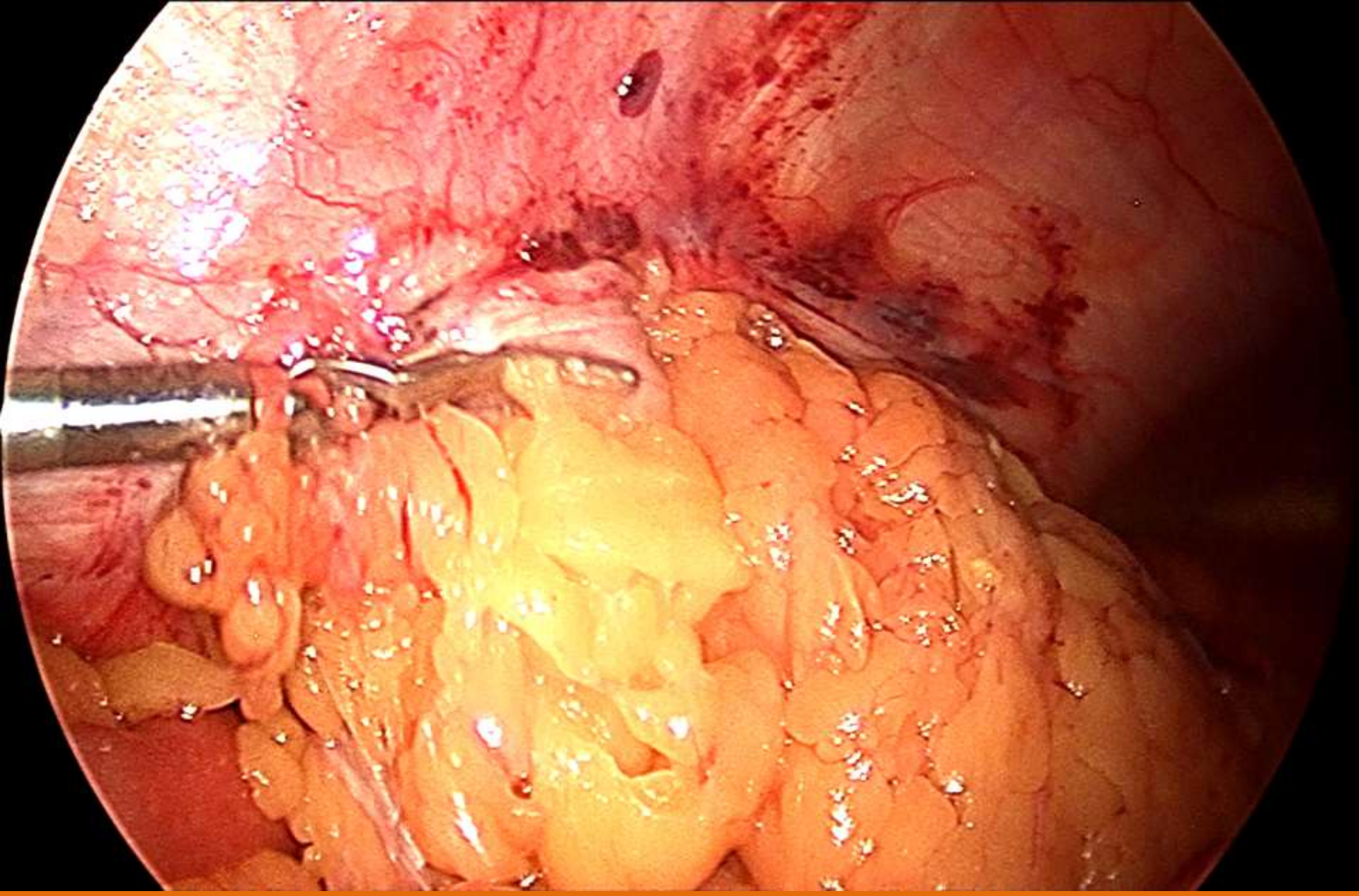
Left Inguinal Hernia



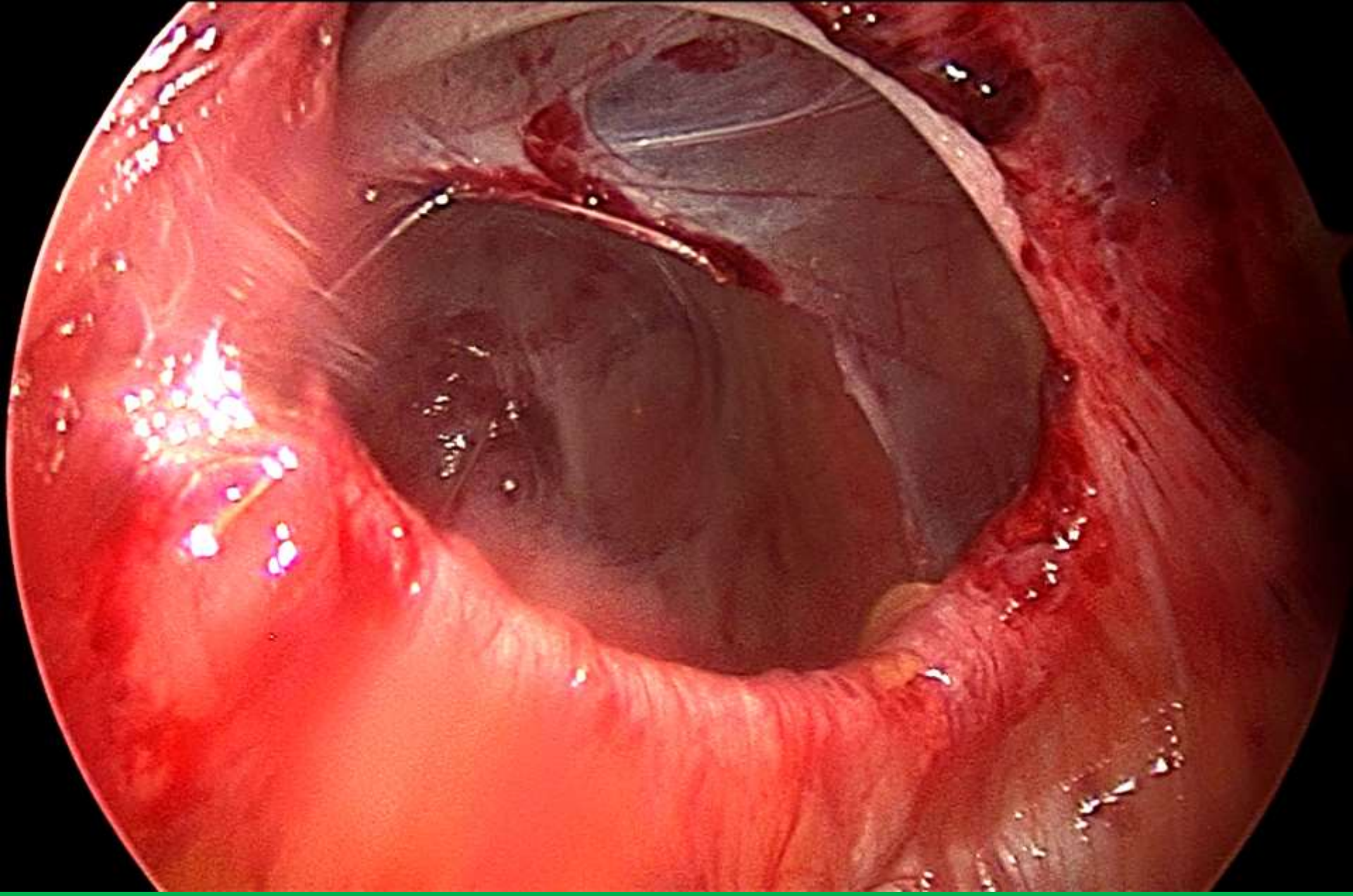
Rt Direct inguinal hernia



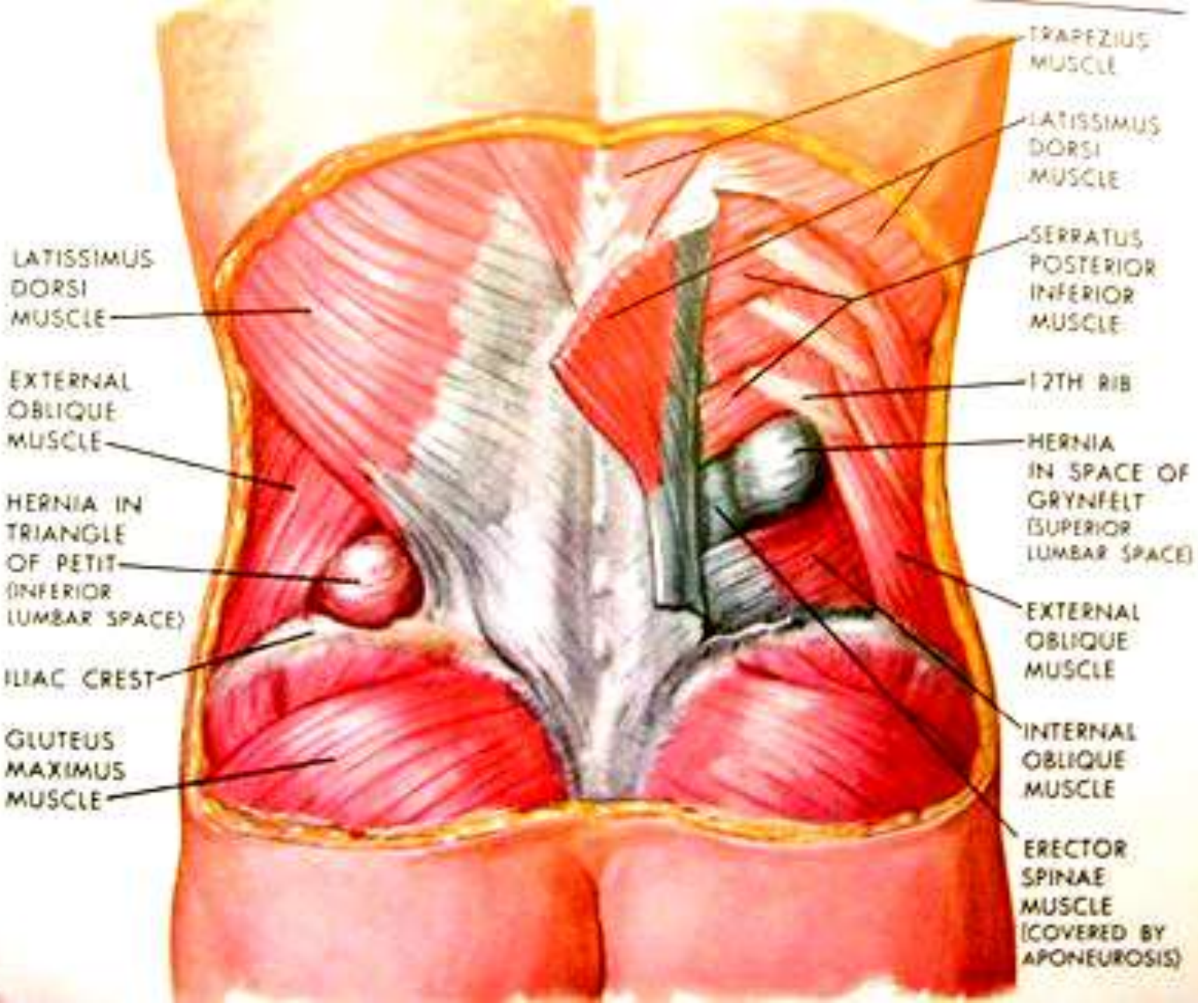
Large RIH



Ventral Hernia



Abdominal Wall Defect After Reduction of Hernia Contents


TRAPEZIUS MUSCLE
LATISSIMUS DORSI MUSCLE
SERRATUS POSTERIOR INFERIOR MUSCLE
12TH RIB
HERNIA IN SPACE OF GRYNFELT (SUPERIOR LUMBAR SPACE)
EXTERNAL OBLIQUE MUSCLE
INTERNAL OBLIQUE MUSCLE
ERECTOR SPINAE MUSCLE (COVERED BY APONEUROSIS)
LATISSIMUS DORSI MUSCLE
EXTERNAL OBLIQUE MUSCLE
HERNIA IN TRIANGLE OF PETIT (INFERIOR LUMBAR SPACE)
ILIAC CREST
GLUTEUS MAXIMUS MUSCLE

HERNIA (EXTERNAL , INTERNAL)

Internal Hernia

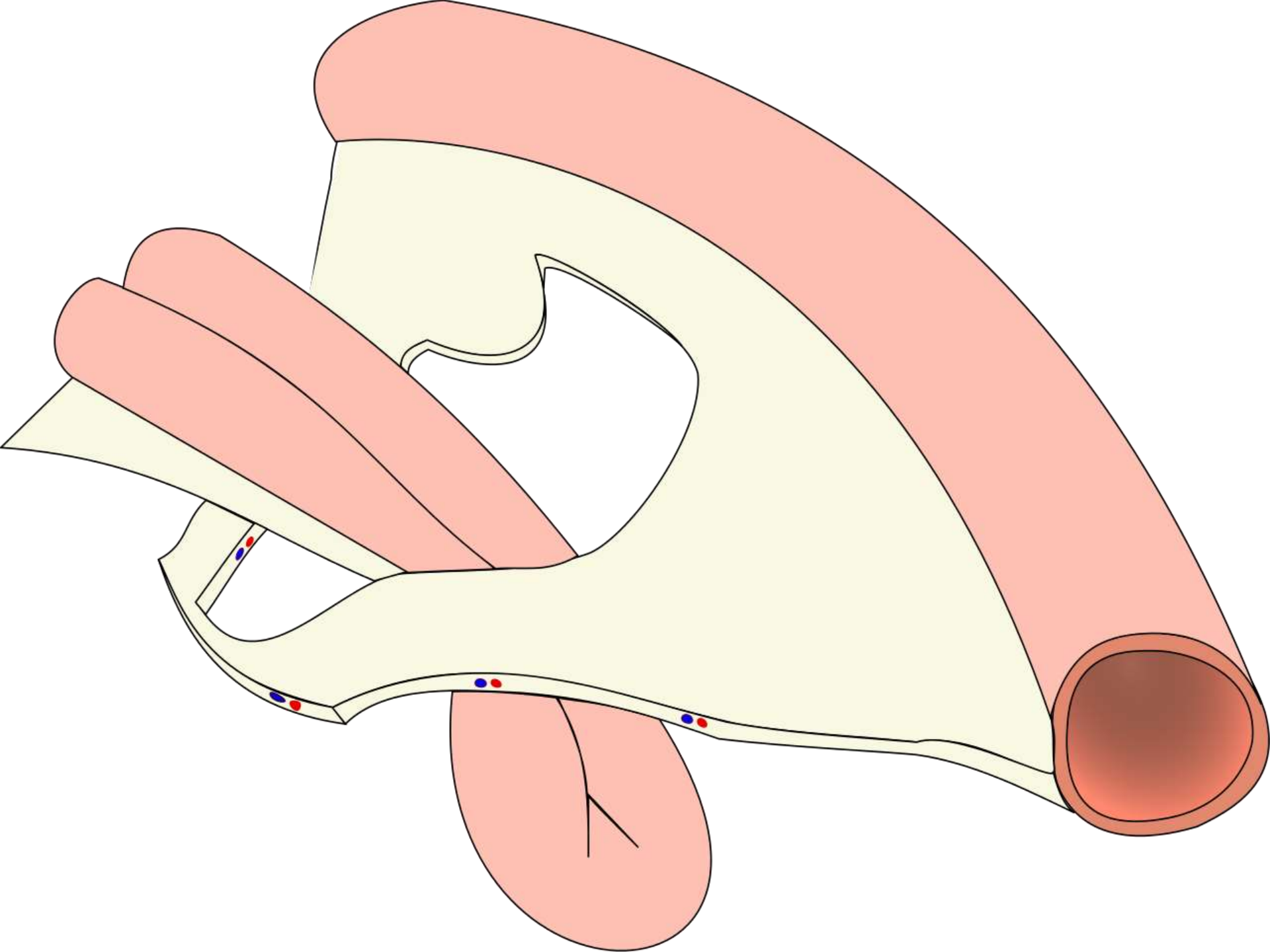
-Entrapment of the bowel loops in the retroperitoneal fossae or a congenital mesenteric defect.

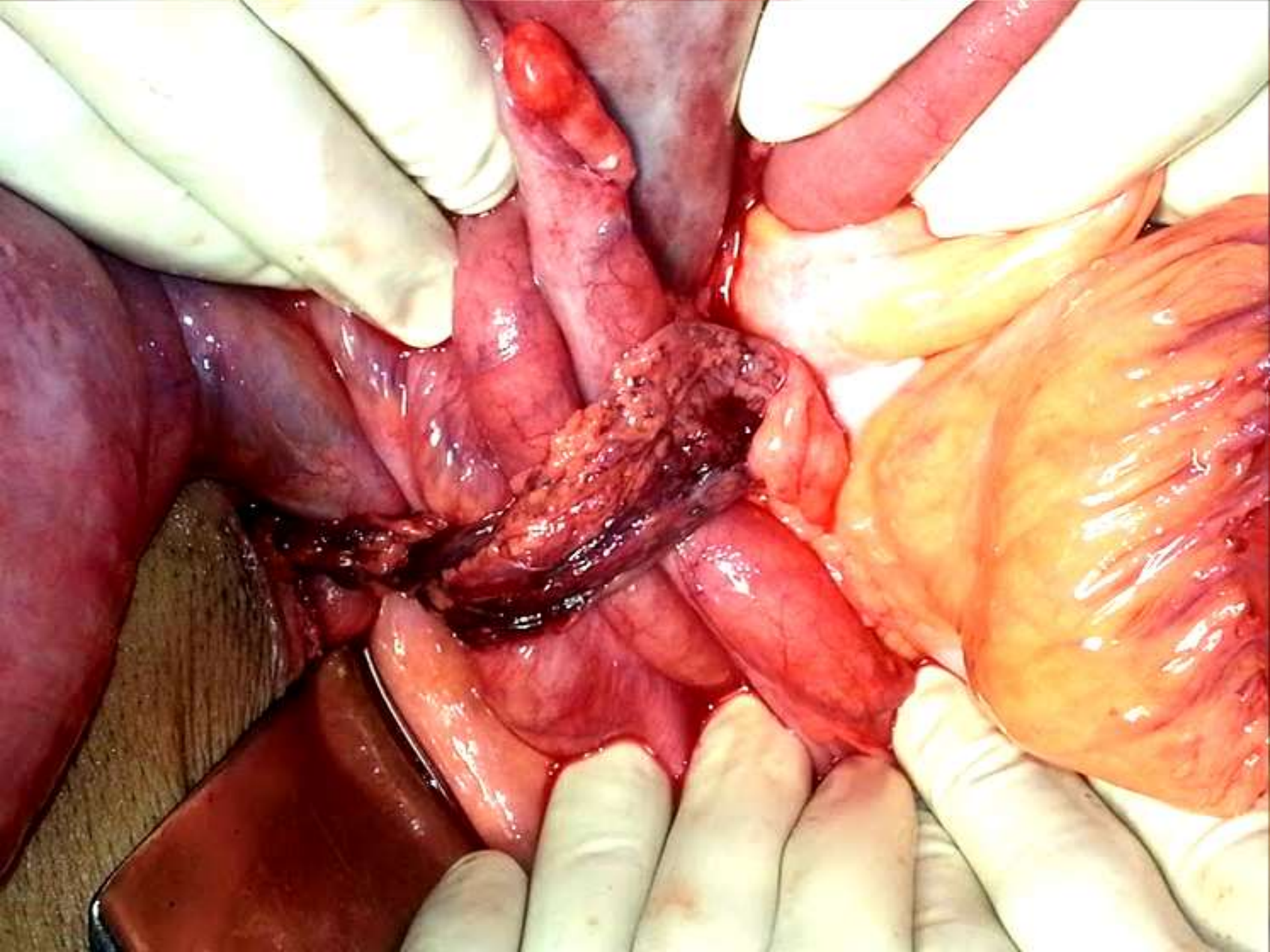
- They are rare.
- Preoperative diagnosis is unusual.
- Rx : is to release the constricting agent by division, except if a major blood vessels is running in the edge of constricting ring.

The following are potential sites of internal herniation (all are rare):

- the foramen of Winslow;
- a defect in the mesentery;
- a defect in the transverse mesocolon;
- defects in the broad ligament;
- congenital or acquired diaphragmatic hernia;
- duodenal retroperitoneal fossae – left paraduodenal and right duodenojejunal;
- caecal/appendiceal retroperitoneal fossae – superior, inferior and retrocaecal;
- intersigmoid fossa.

- Following Surgery (Gastro-jejunostomy)

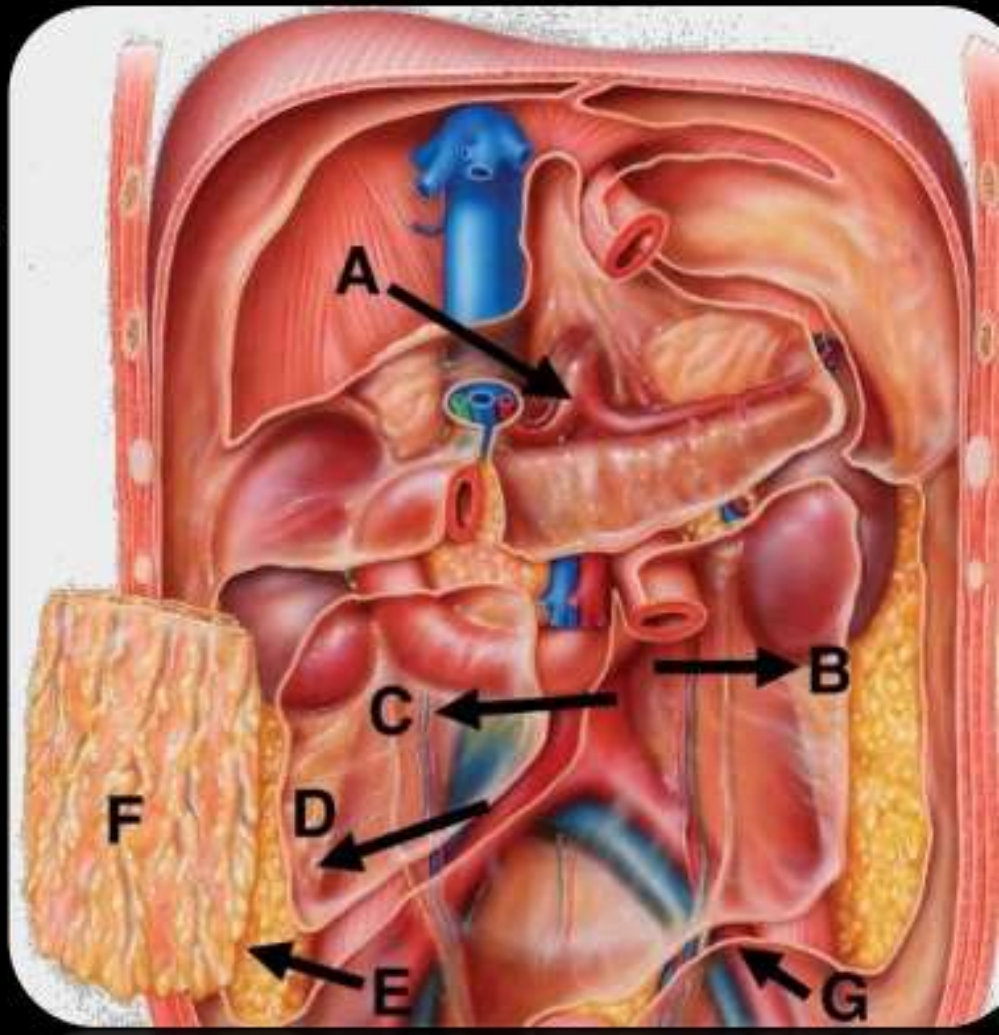


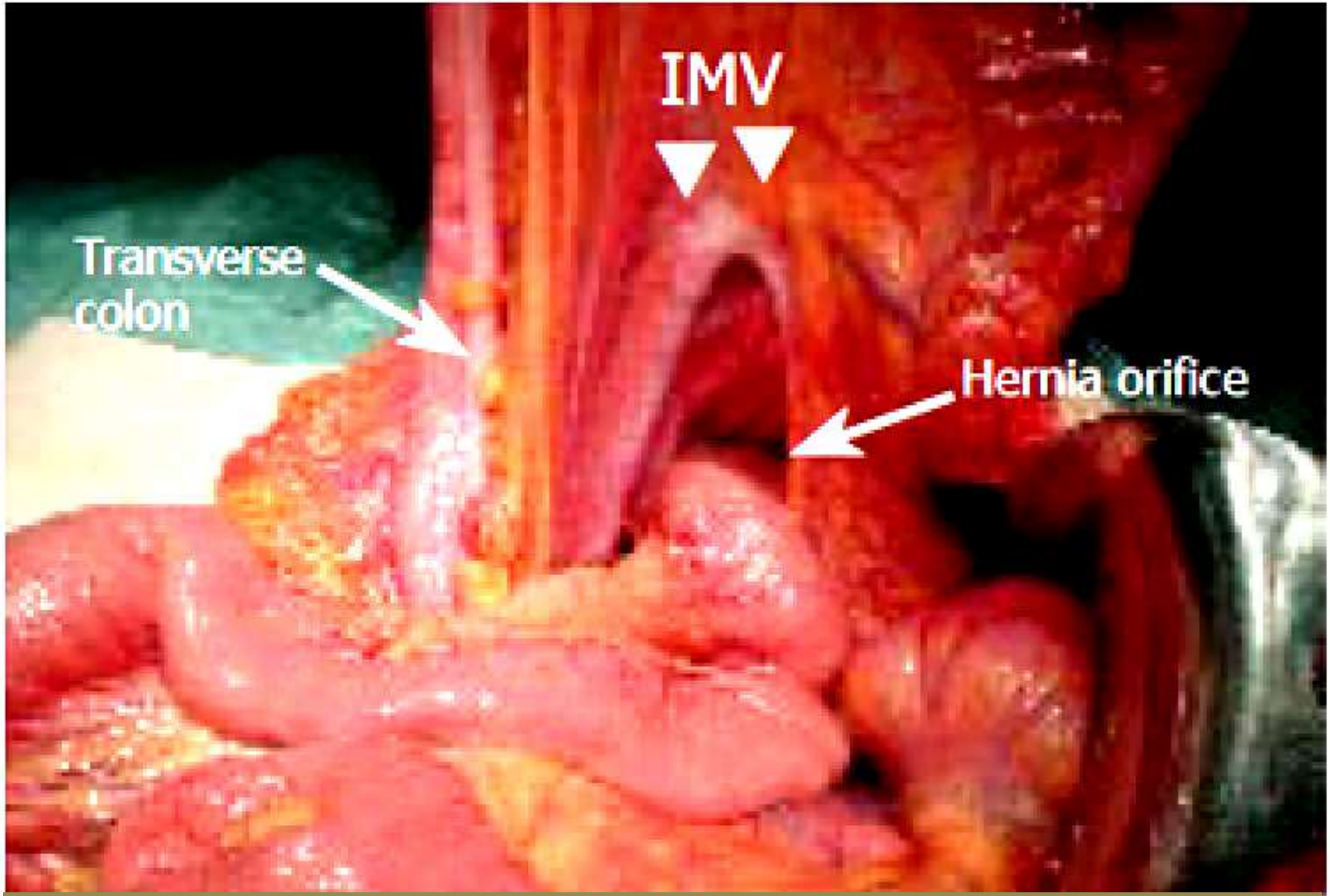


Hernias.

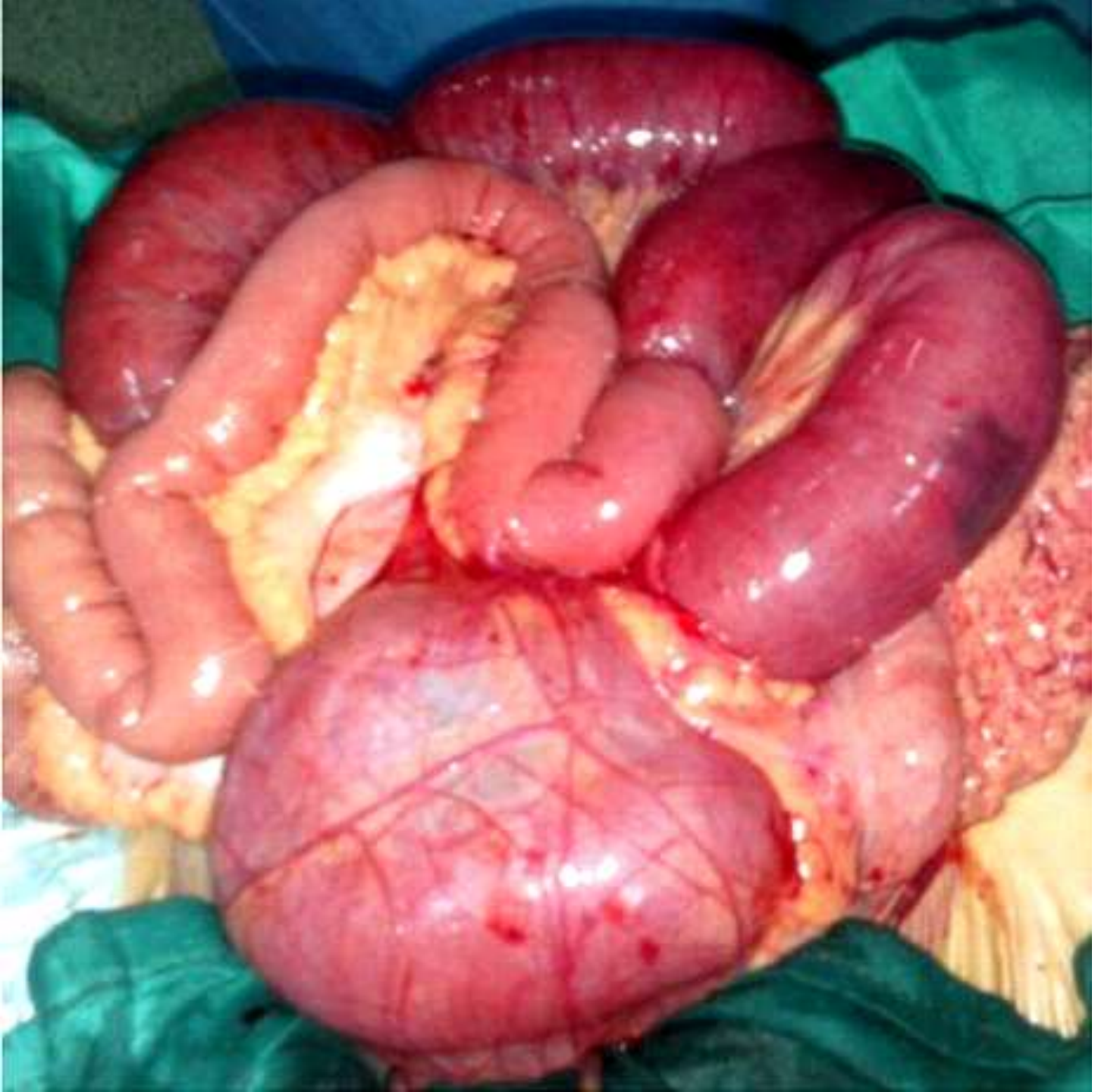
- Internal hernias:

A: Foramen of Winslow
B: Right paraduodenal hernia
C: Left paraduodenal hernia
D: hernia transmesentérica
E: hernia pericecal
F: hernia transomental
G: intersigmoidea hernia.

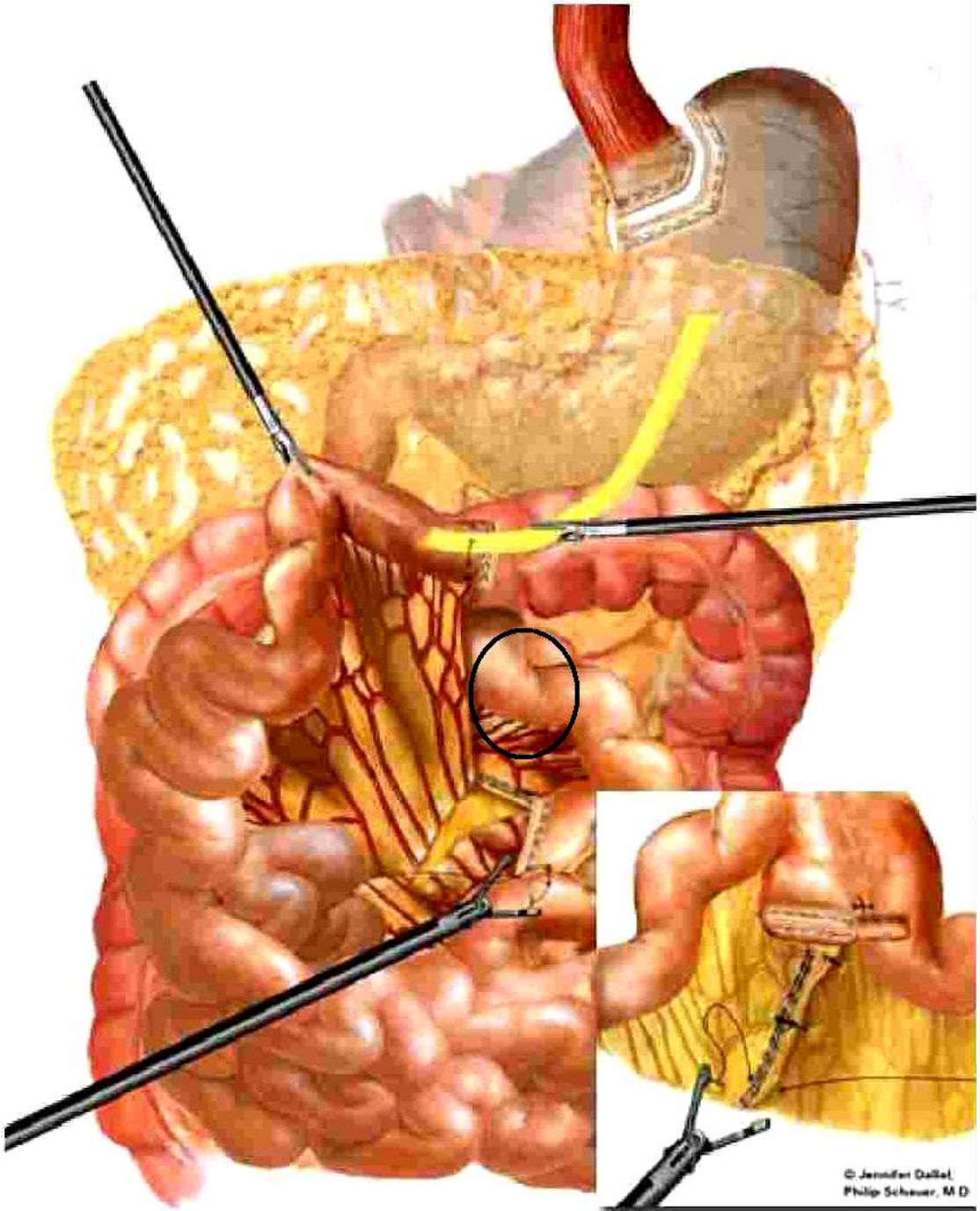




Large orifice of the hernia sac (white arrow) in the transverse mesentery and IMV formation. The small intestine had herniated through hernia orifice.



Part of the jejunum was reduced, the other part is still in the retrocolic hernial bag and the level of strangulation is clearly visible.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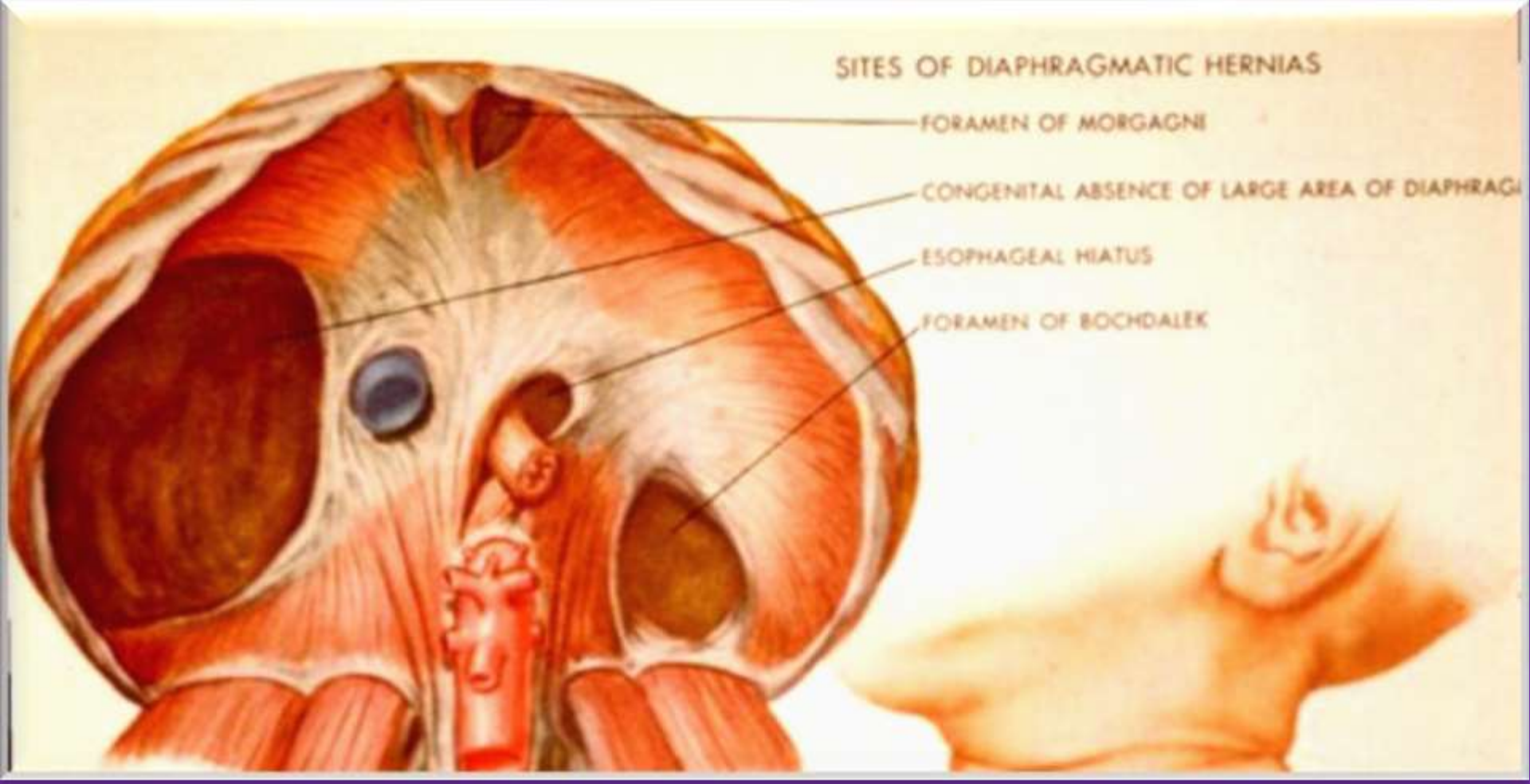
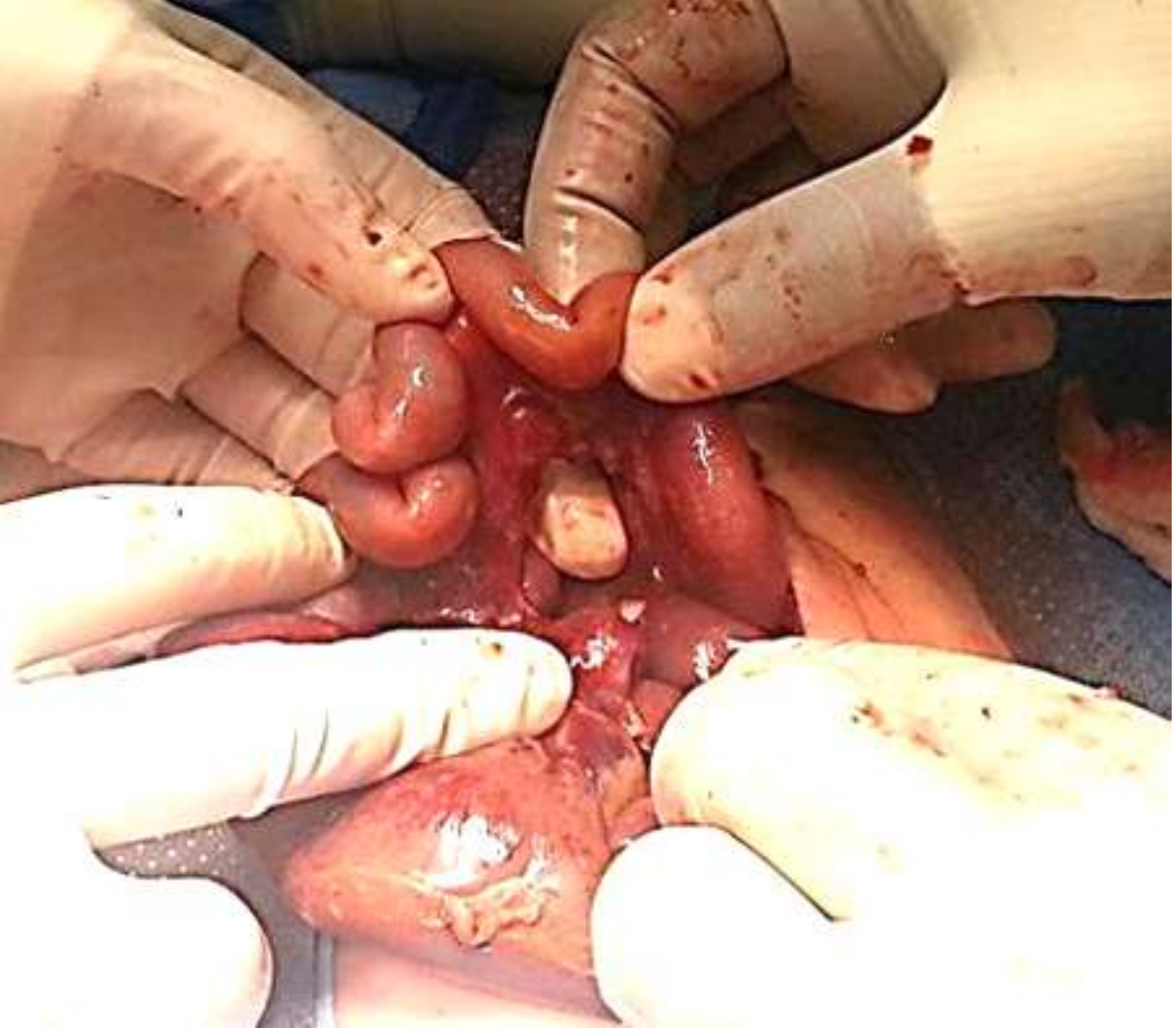
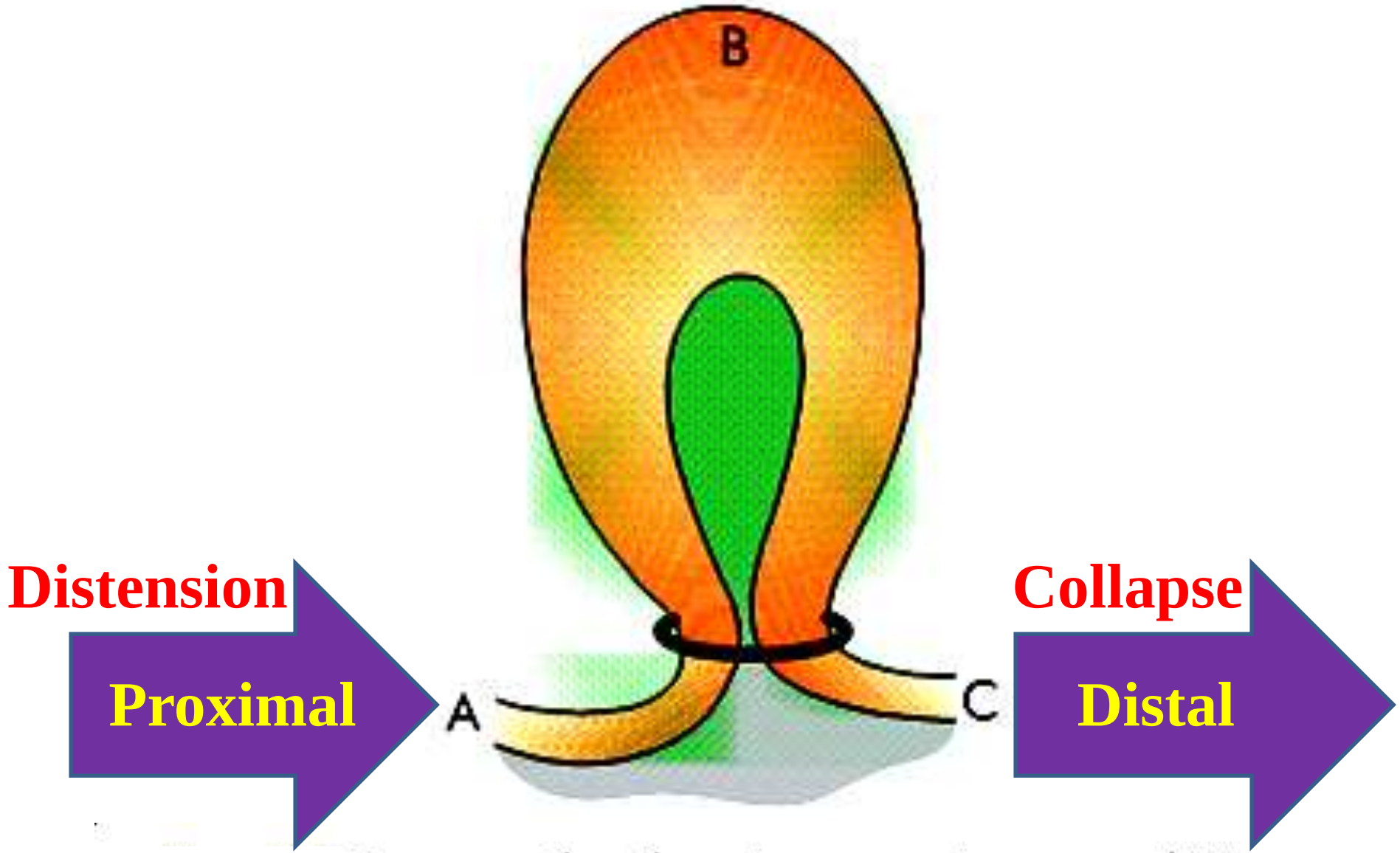
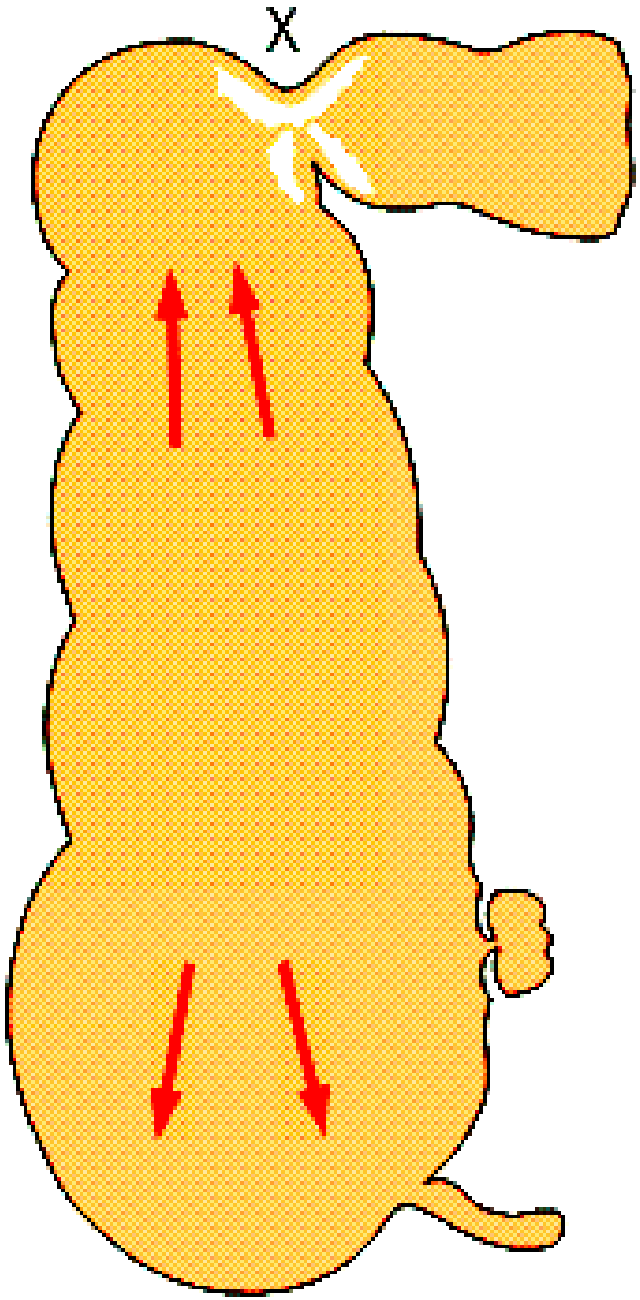

SITES OF DIAPHRAGMATIC HERNIAS
FORAMEN OF MORGAGNI
CONGENITAL ABSENCE OF LARGE AREA OF DIAPHRAG
ESOPHAGEAL HIATUS
FORAMEN OF BOCHDALEK



Closed Loop Obstruction



Distension. Closed-loop obstruction with no proximal (A) or distal (C) distension and impending strangulation (B).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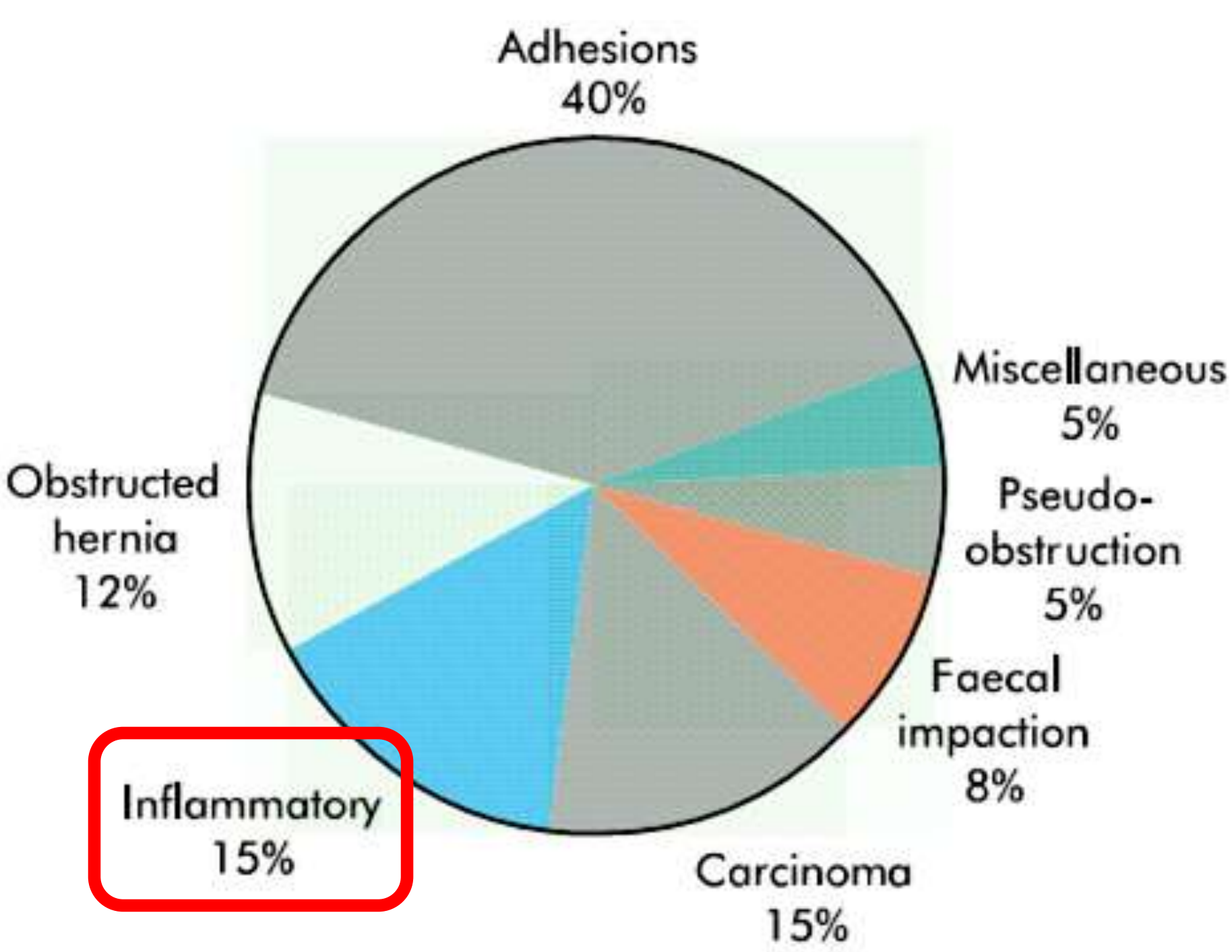
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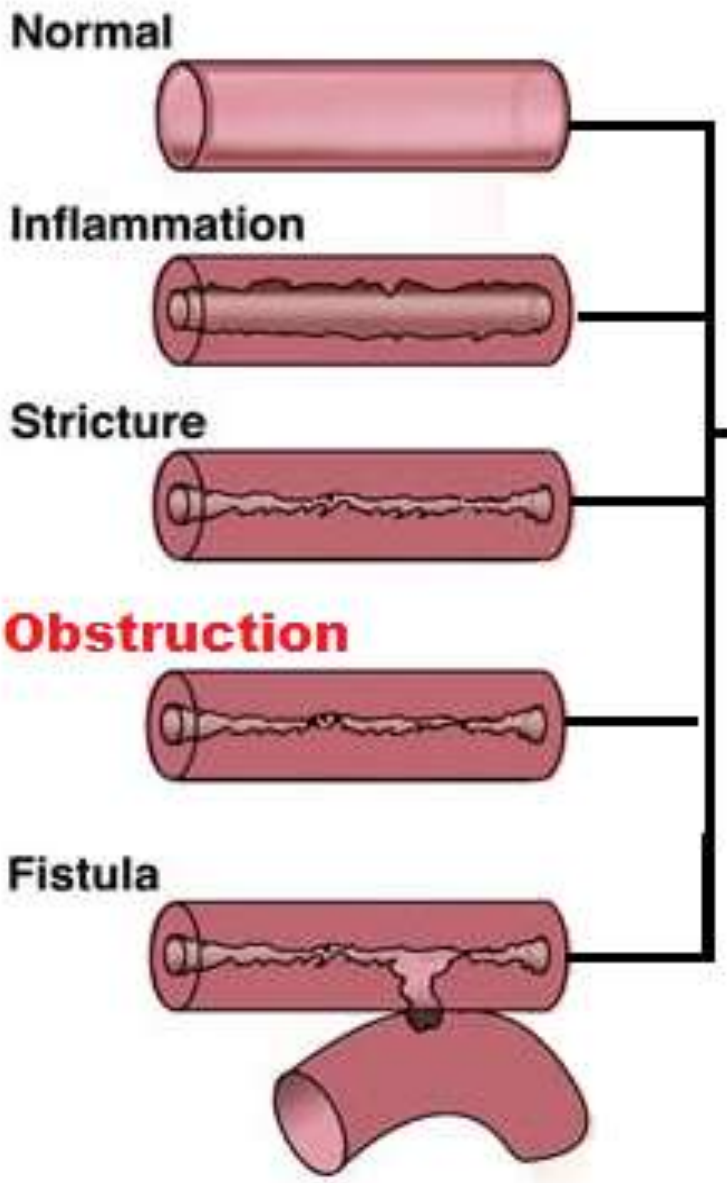
Complications of Crohn's disease



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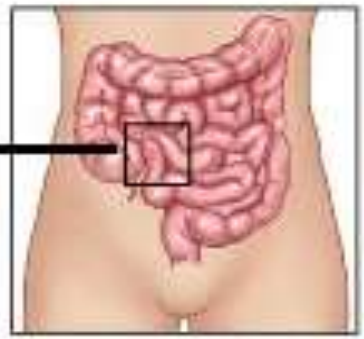
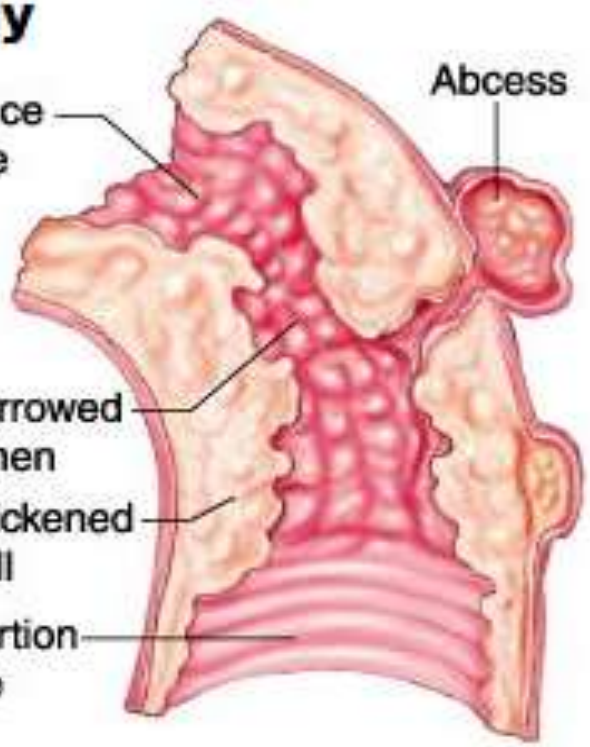




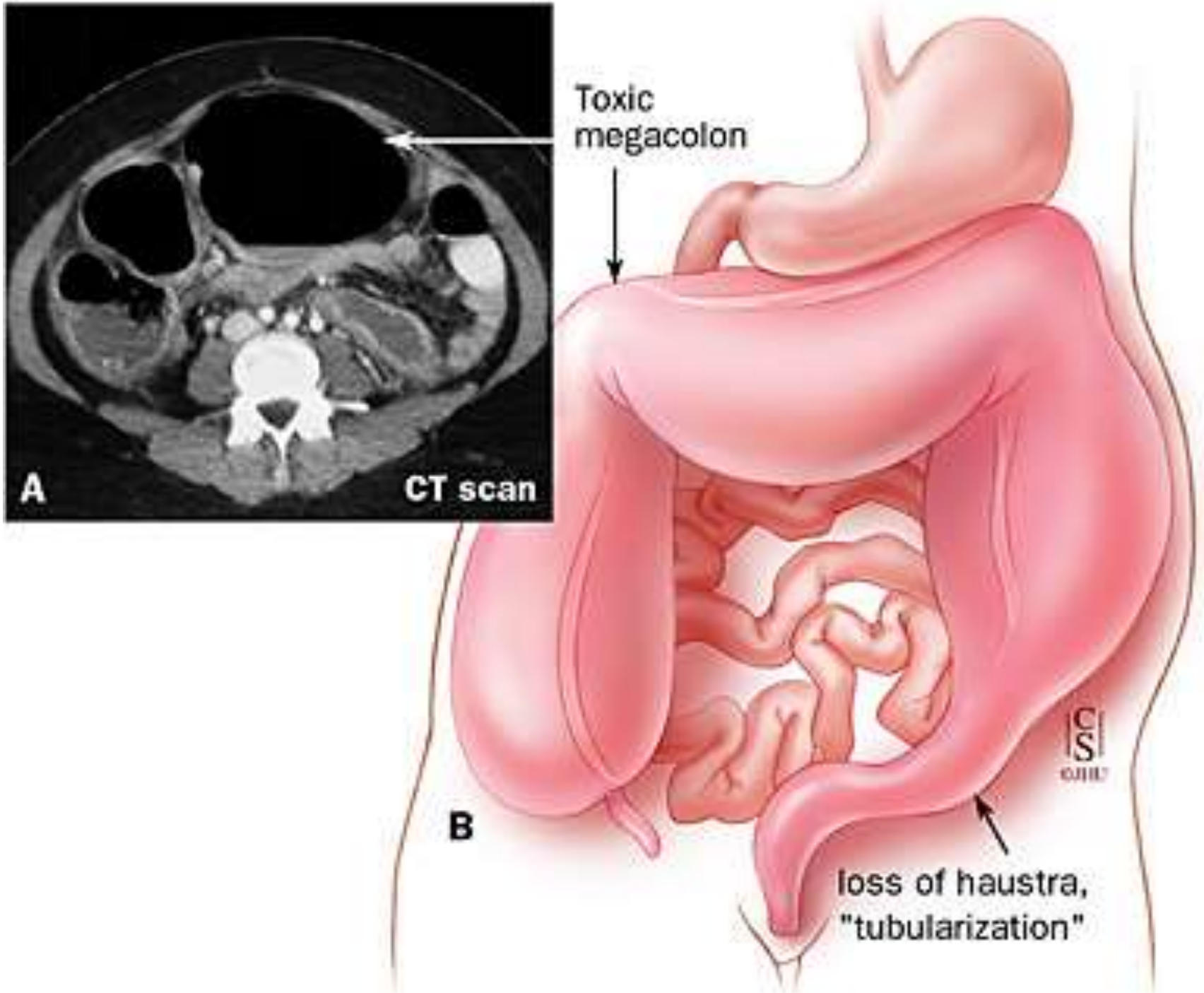
Clinical Manifestations

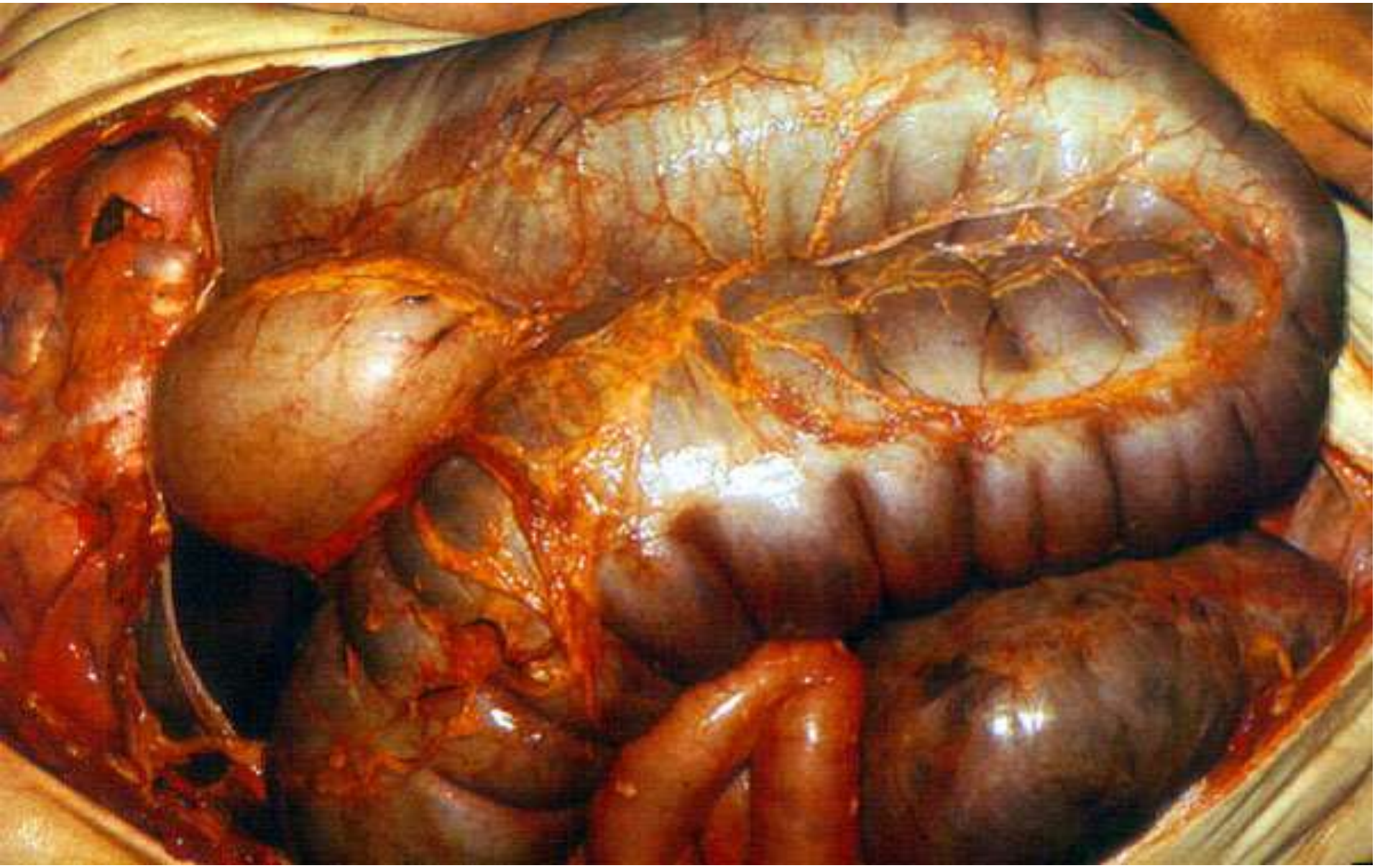
Crohns

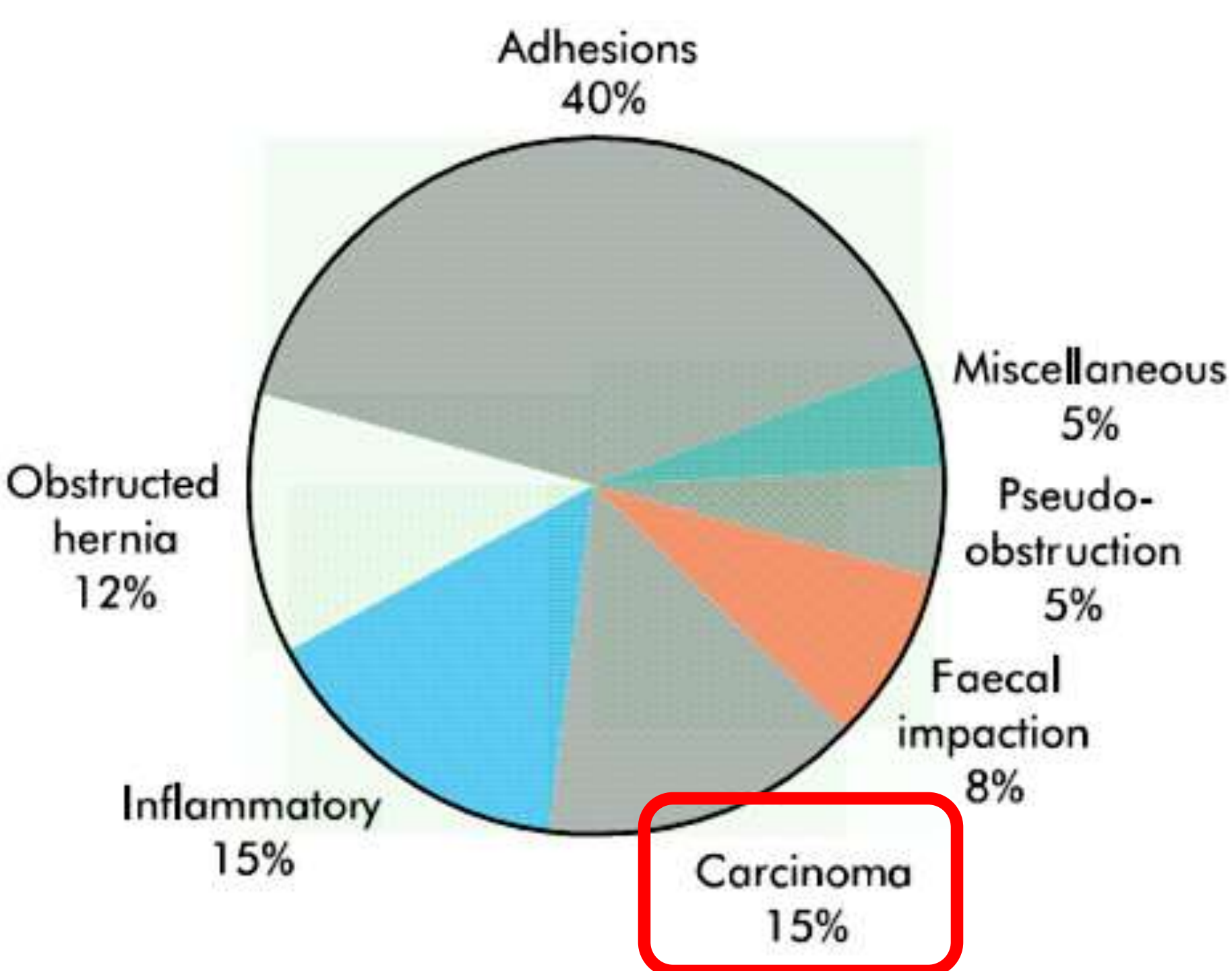
- Onset is usually insidious with nonspecific complaints of diarrhea,fatigue abdominal pain weight loss and fever,dehydration,malnutrition,anemia and increased peristalsis

Ulcerative colitis

- Diarrhea is a predominate sign
- Usually 15-20 liquid stools a day containing blood, mucus and pus.
- Abdominal cramps
- Involuntary leakage of stools
- May include toxic megacolon (toxic dilation of large bowel) a lifethreating condition.


A
CT scan
Toxic
megacolon
B
loss of haustra,
"tubularization"

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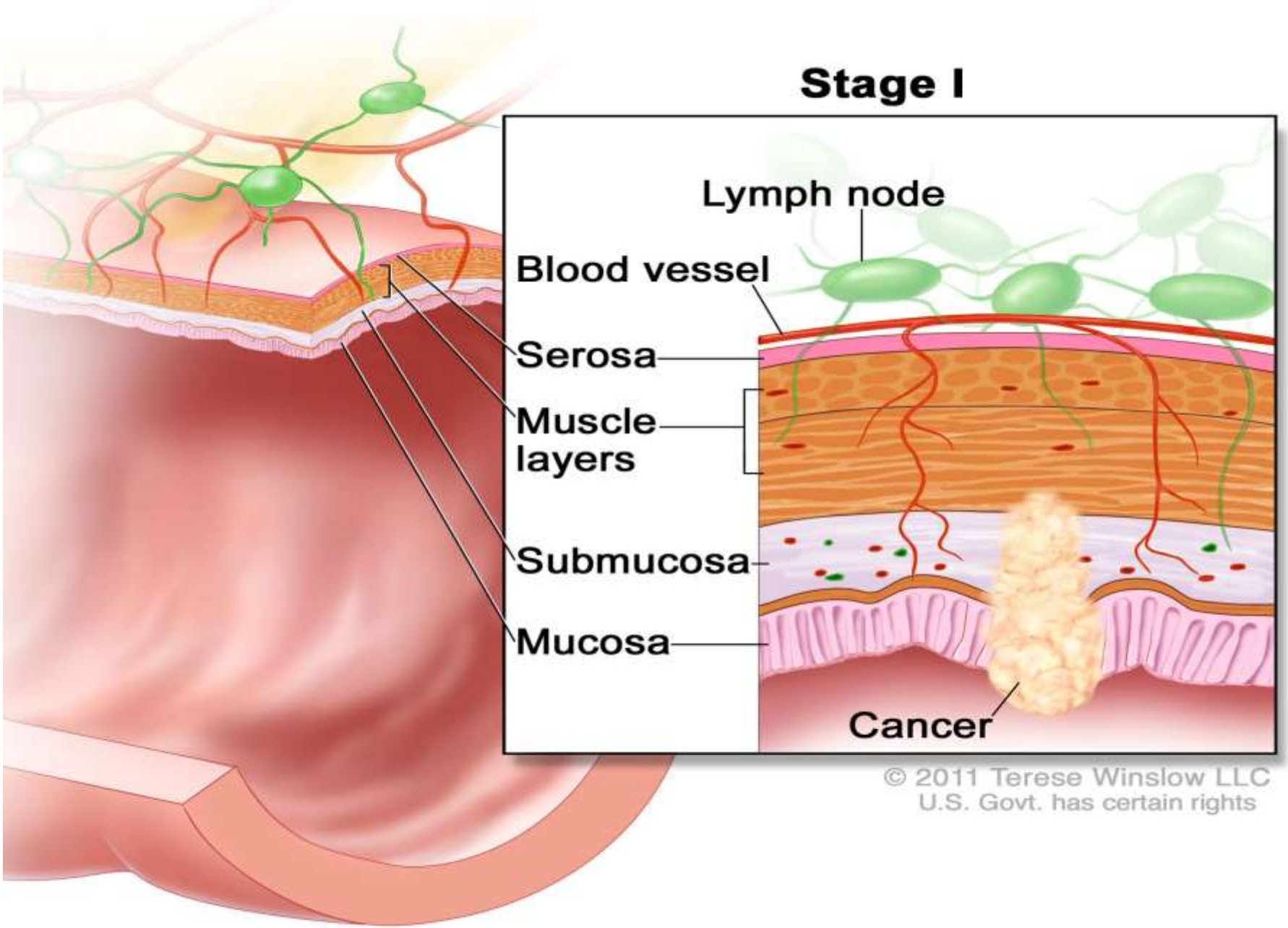
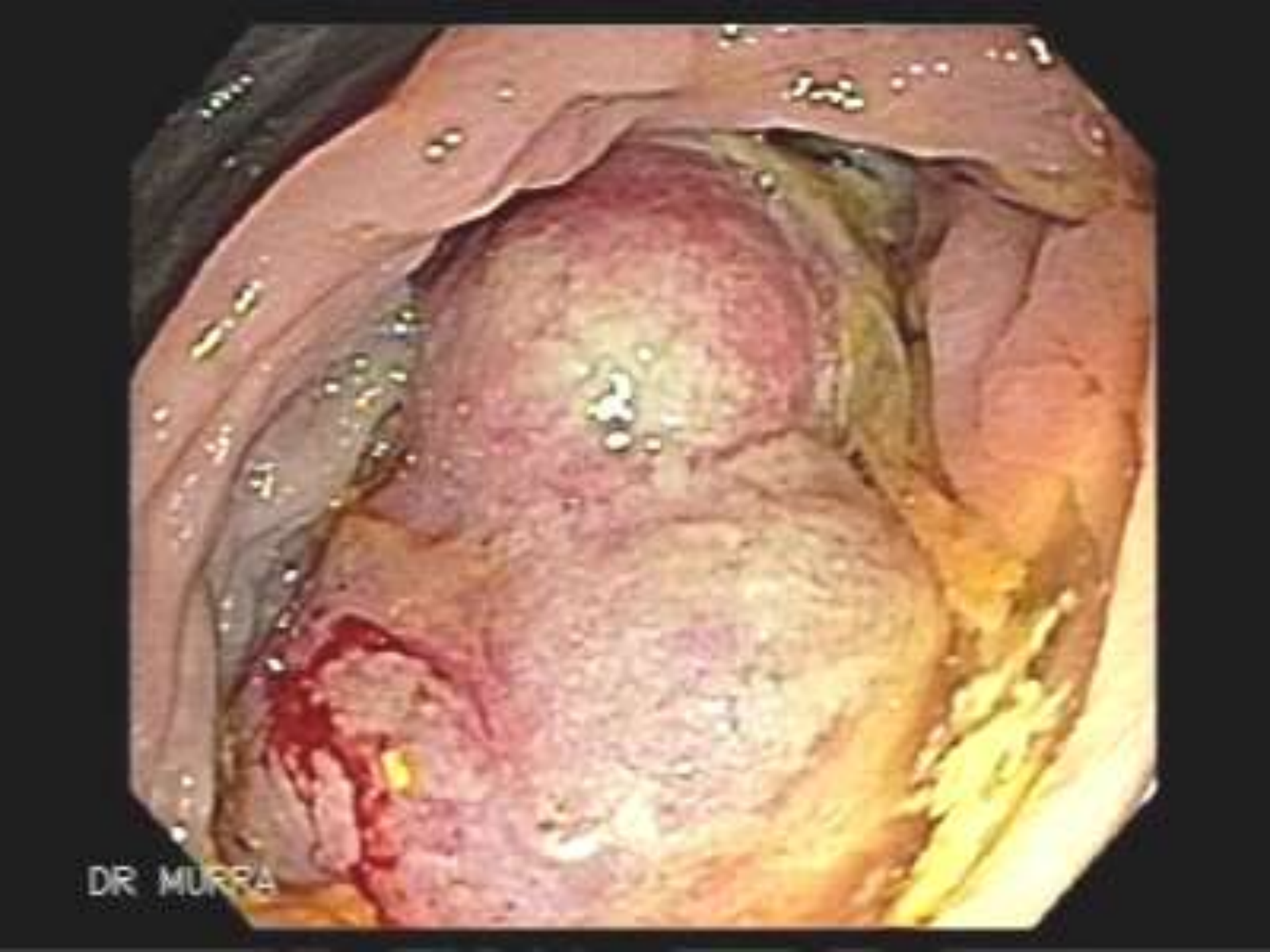
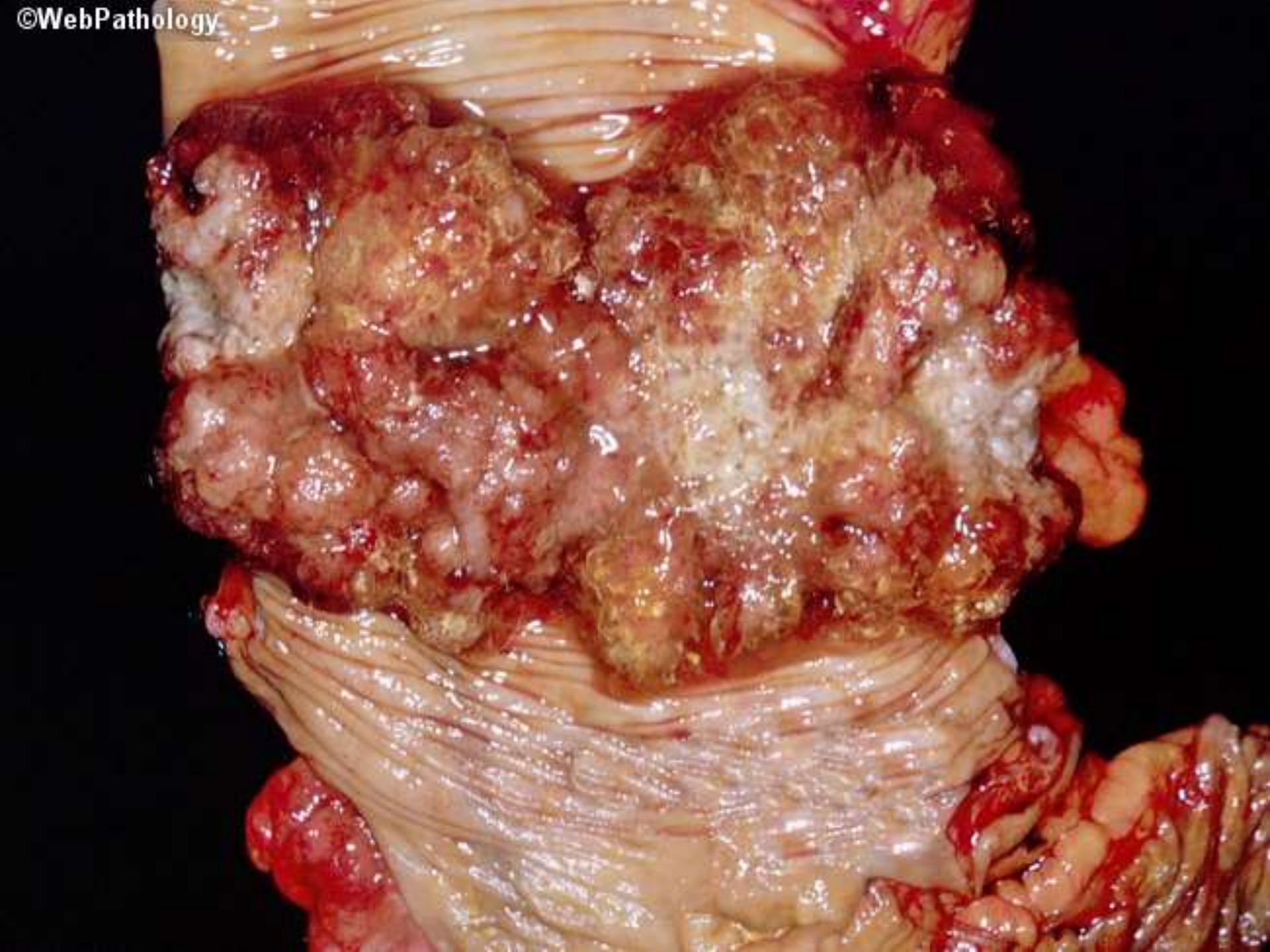



DR MURRA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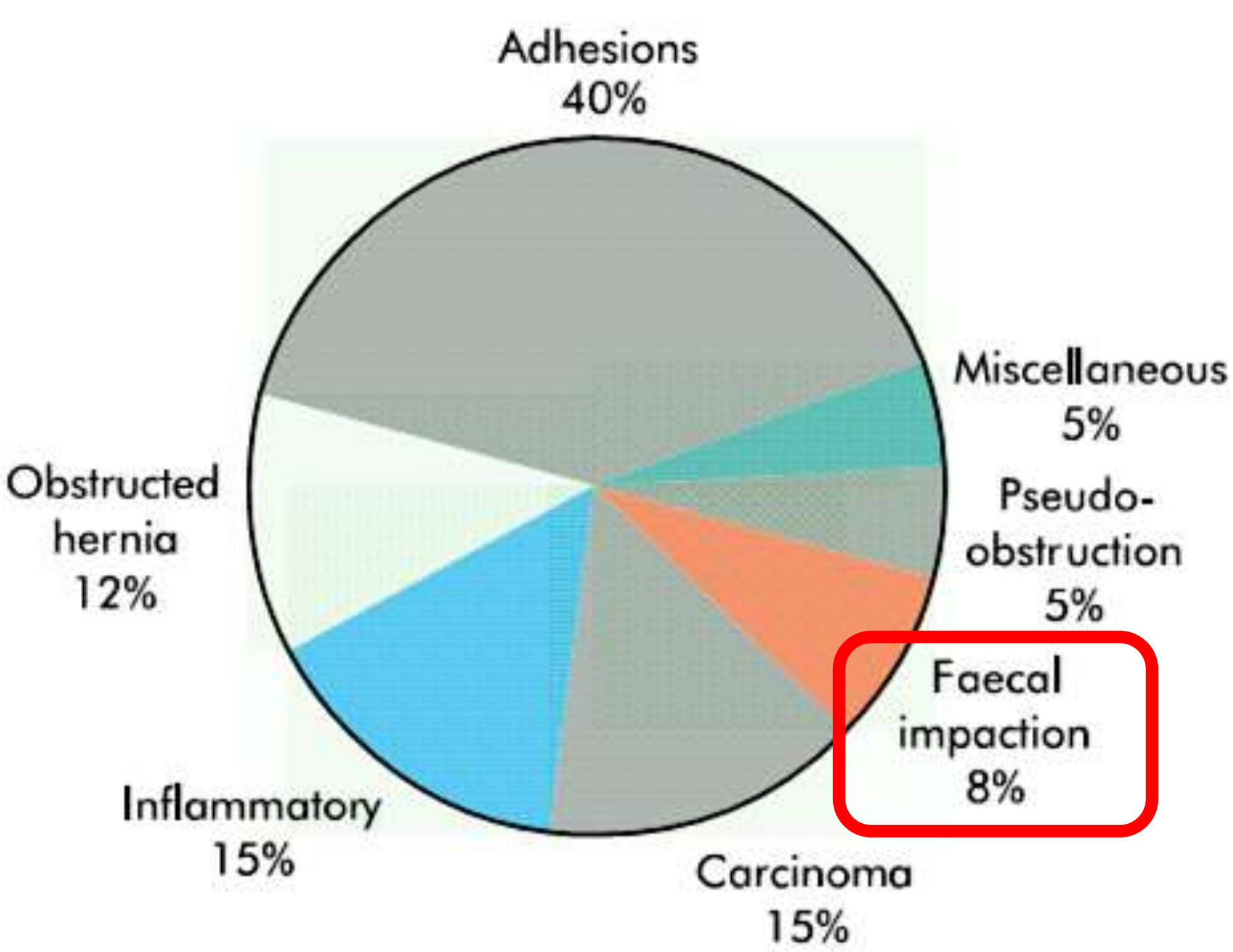
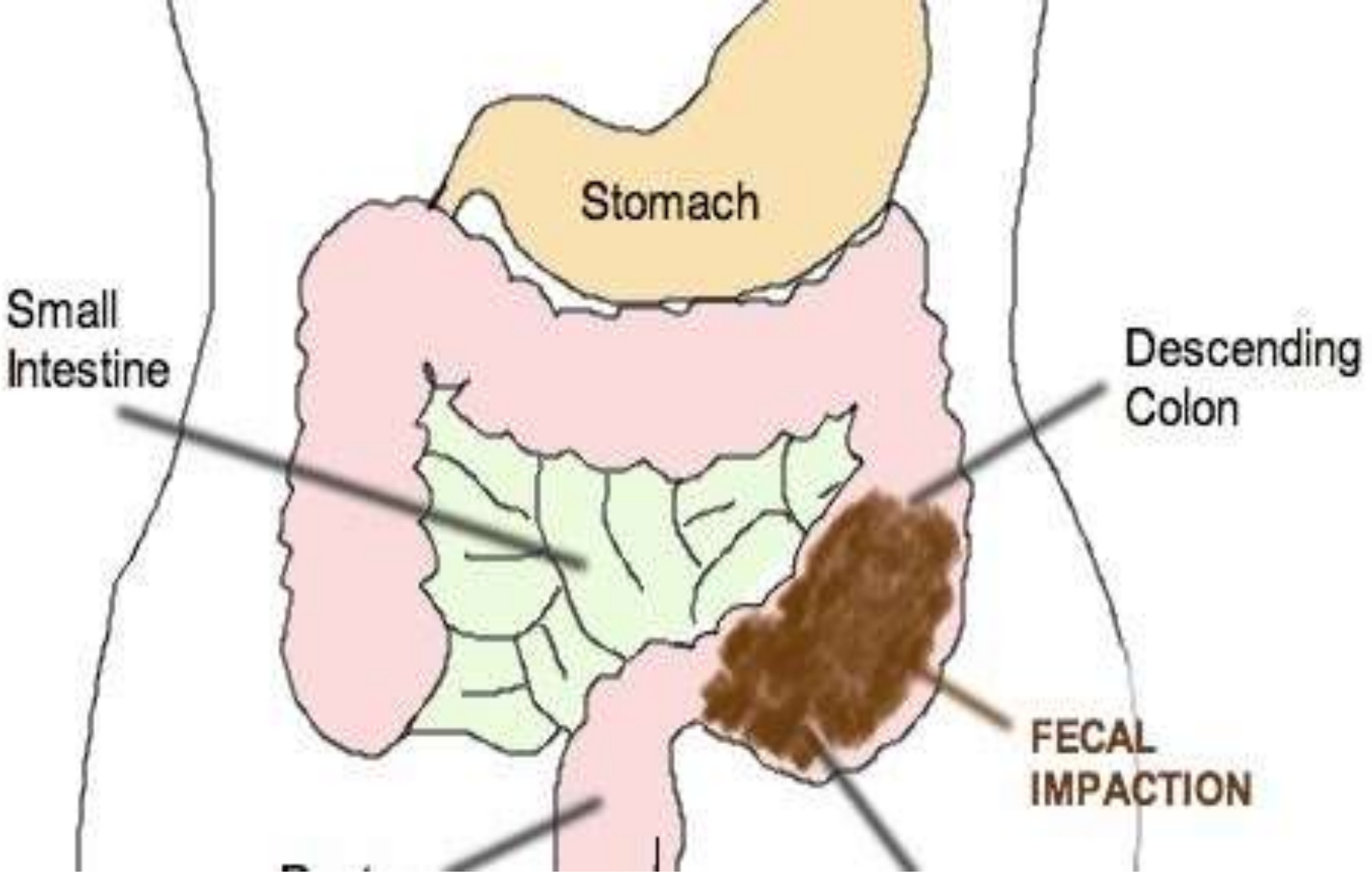
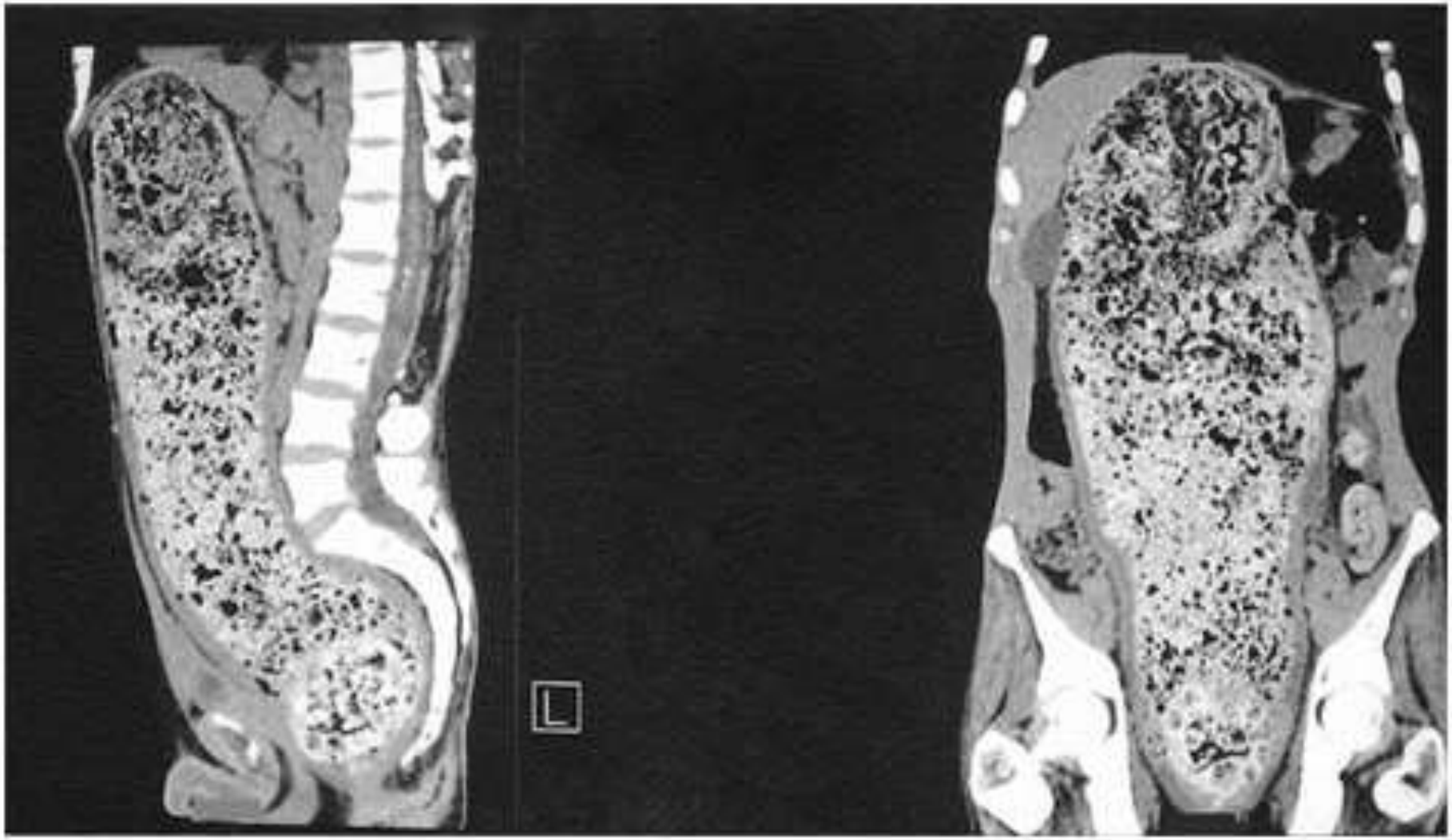

Adhesions
40%
Miscellaneous
5%
Pseudo-
obstruction
5%
Faecal
impaction
8%
Carcinoma
15%
Inflammatory
15%
Obstructed
hernia
12%


Stomach
Small Intestine
Descending Colon
FECAL IMPACTION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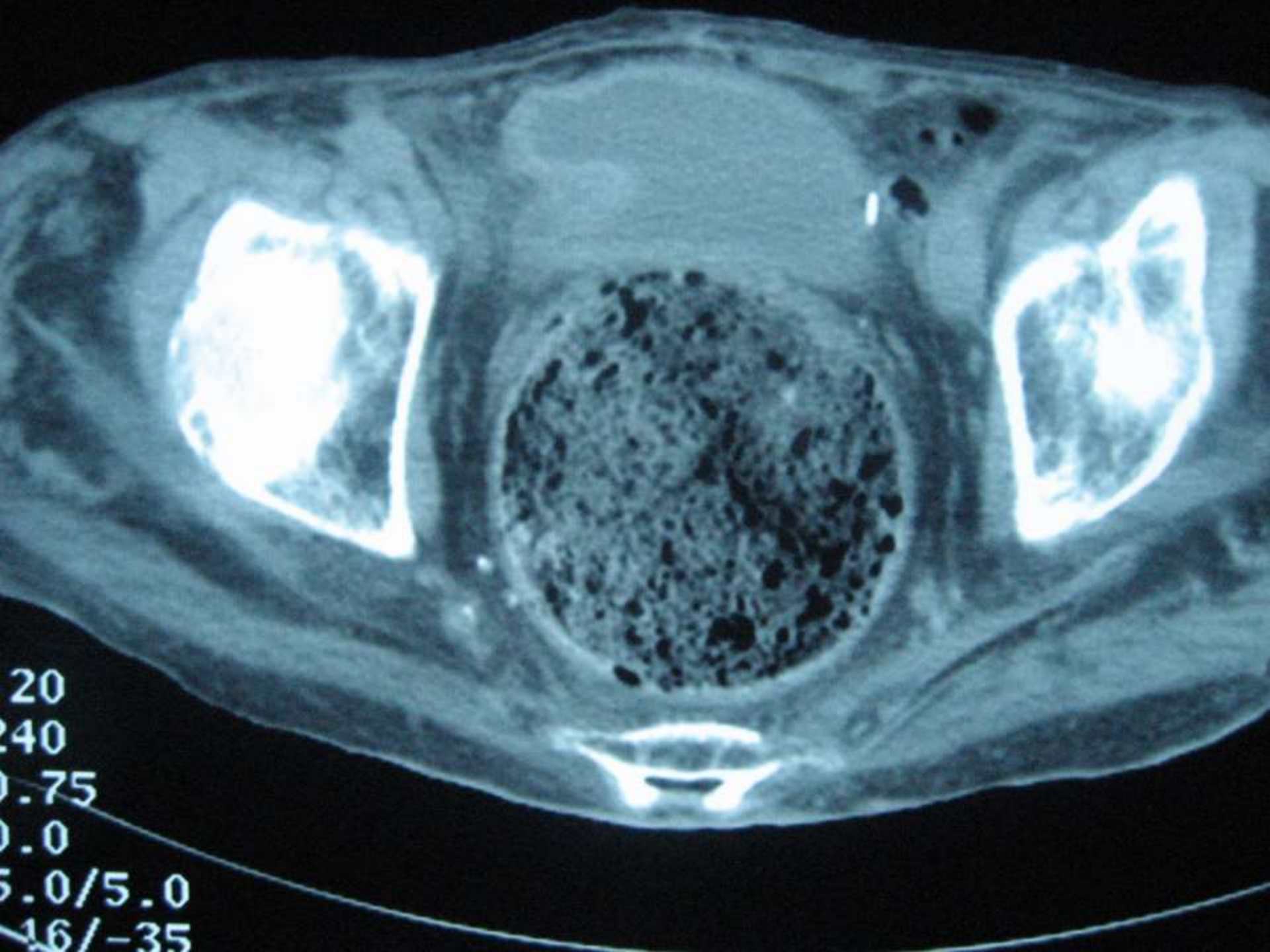
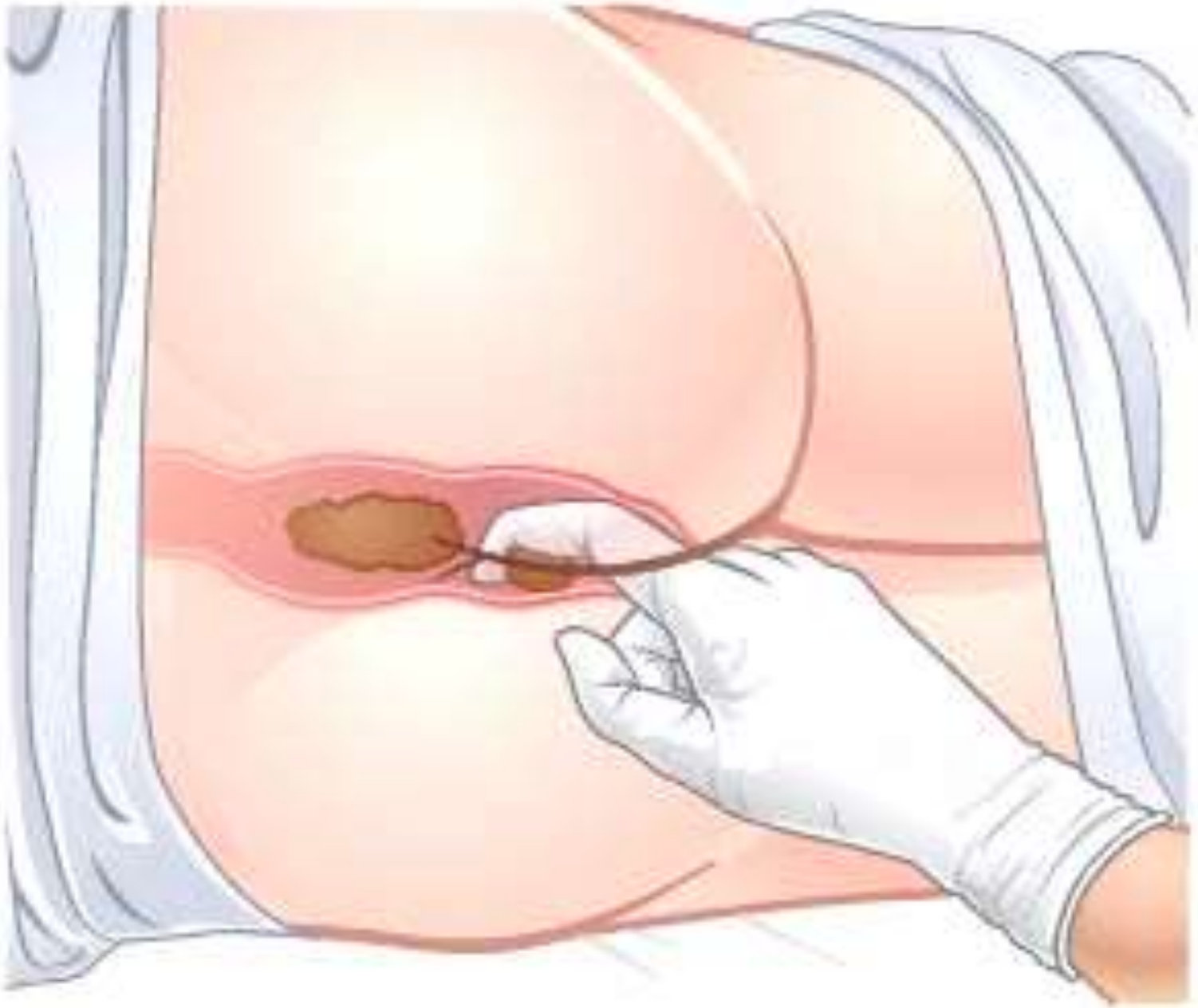
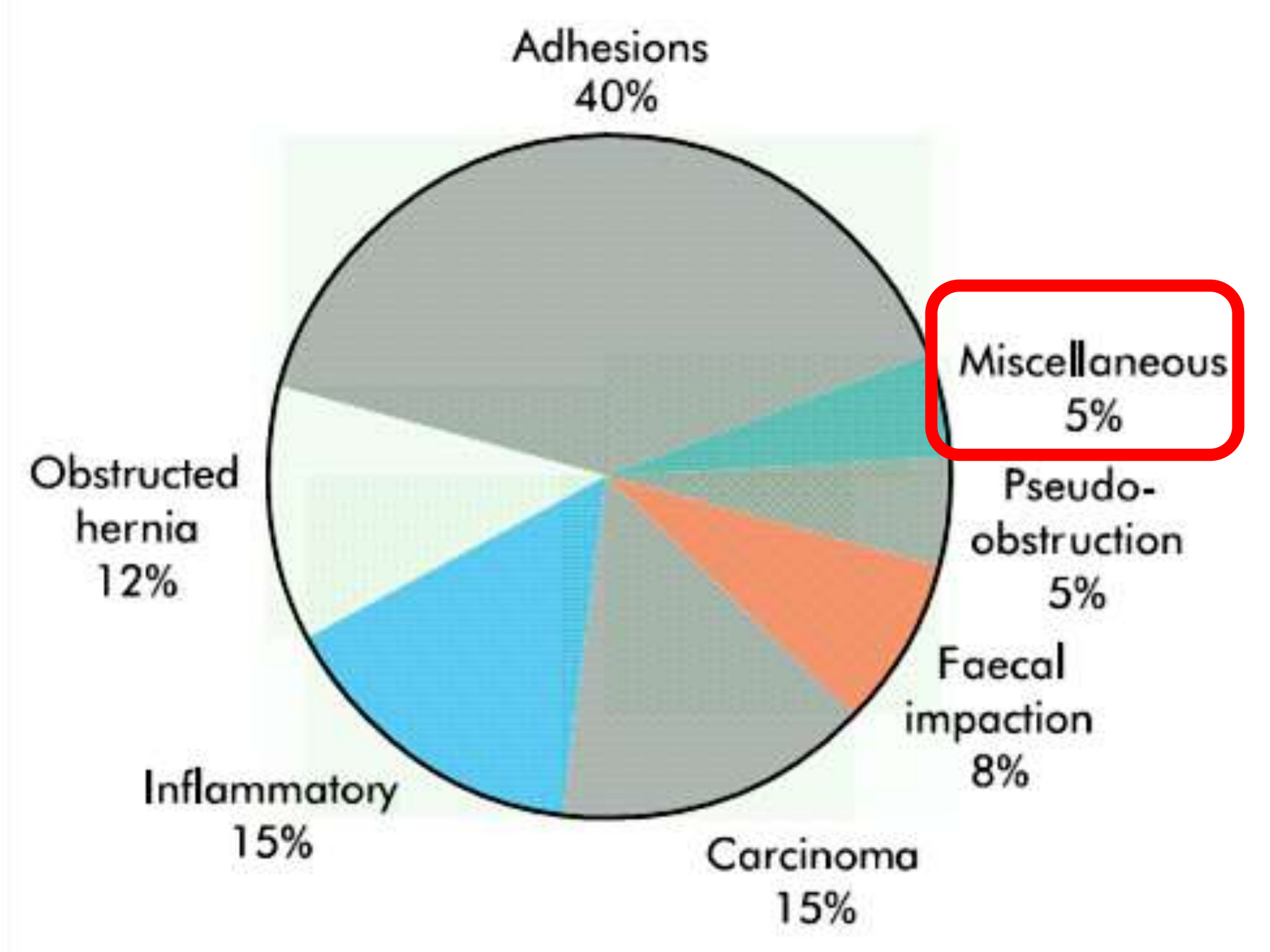

20
240
.75
.0
5.0/5.0
46/-35



Bristol Stool Chart

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. **Entirely Liquid**


Adhesions
40%
Miscellaneous
5%
Pseudo-
obstruction
5%
Faecal
impaction
8%
Carcinoma
15%
Inflammatory
15%
Obstructed
hernia
12%

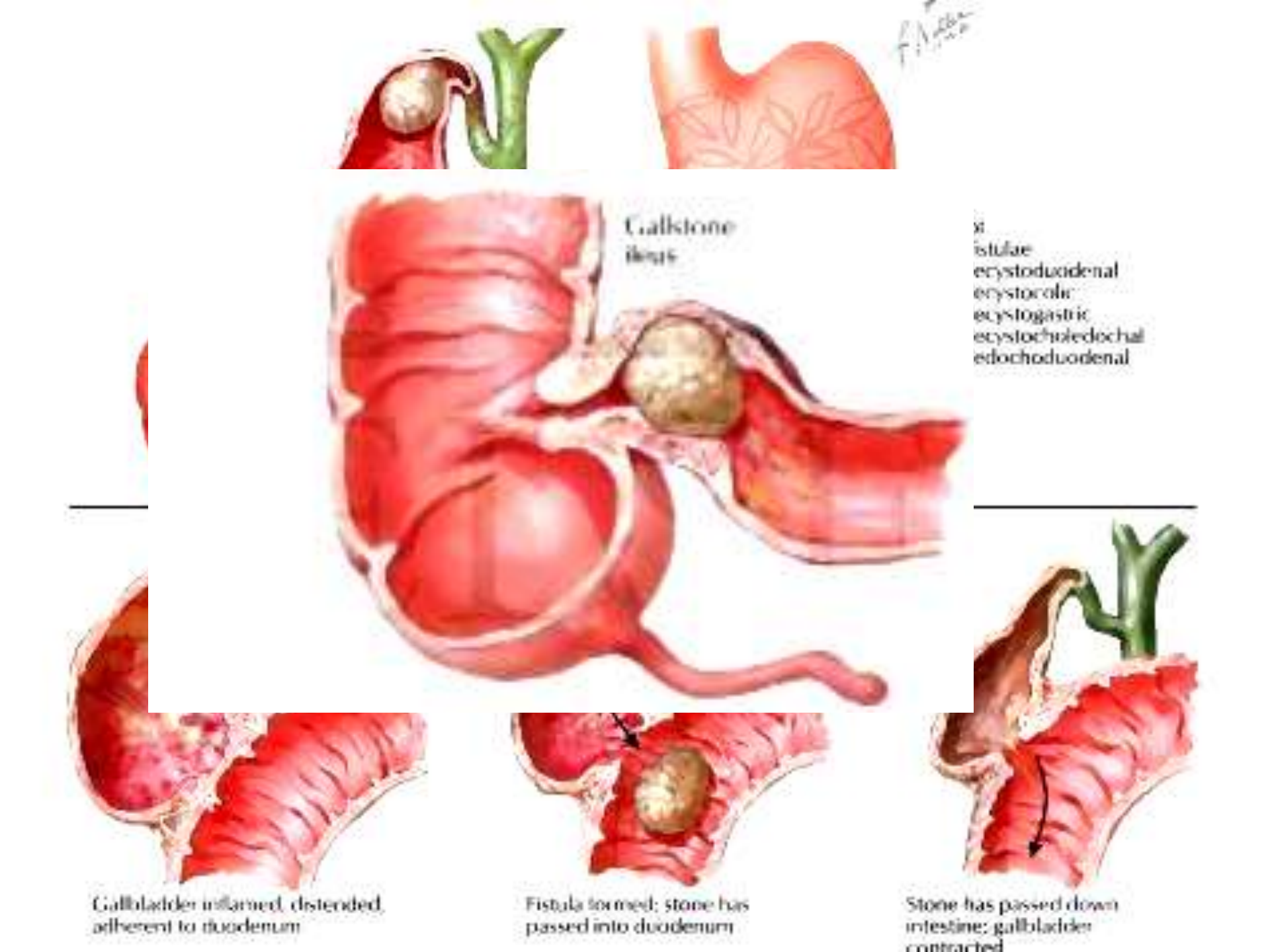
Gall Stone Ileus

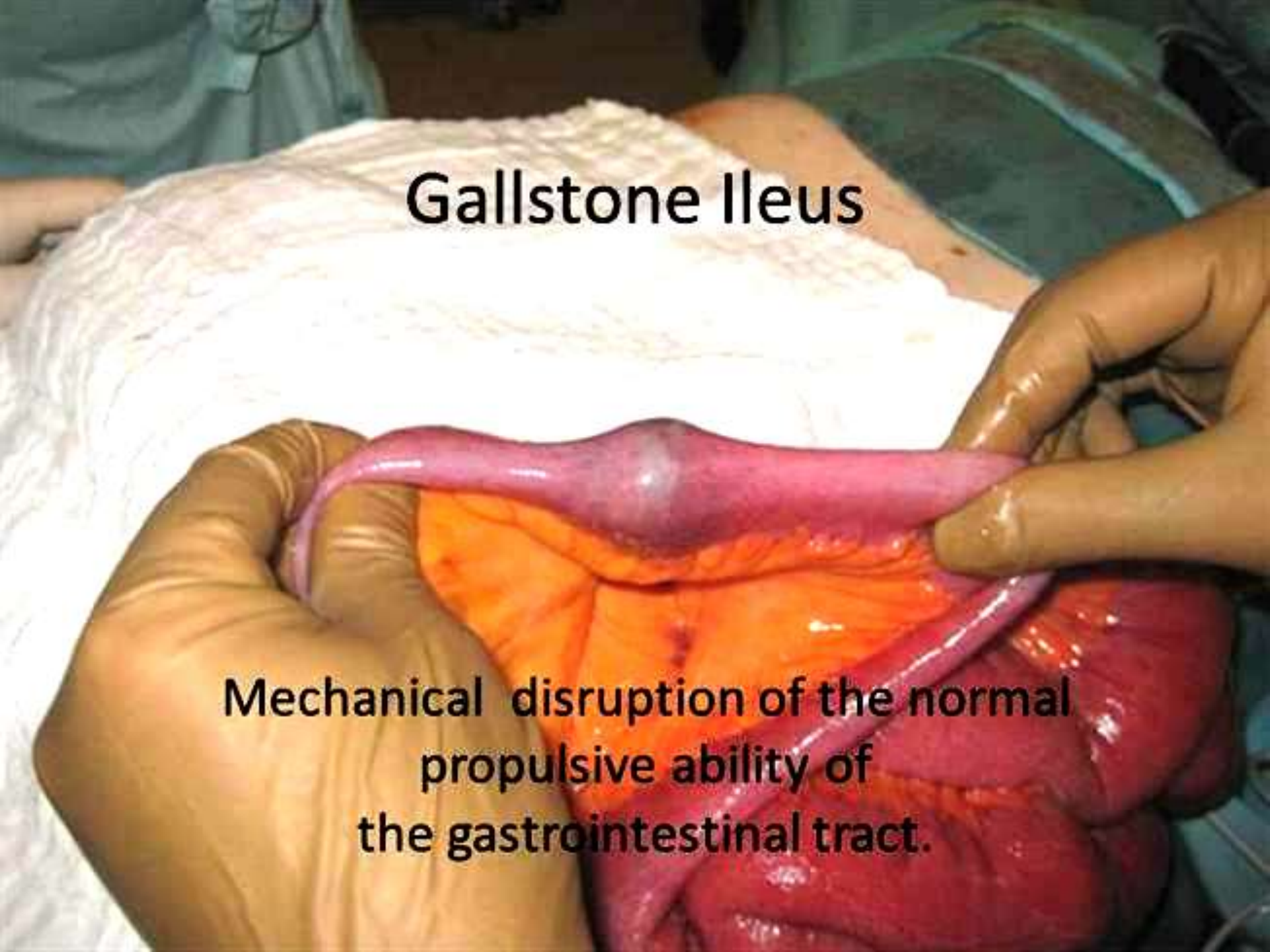
-Intraluminal.

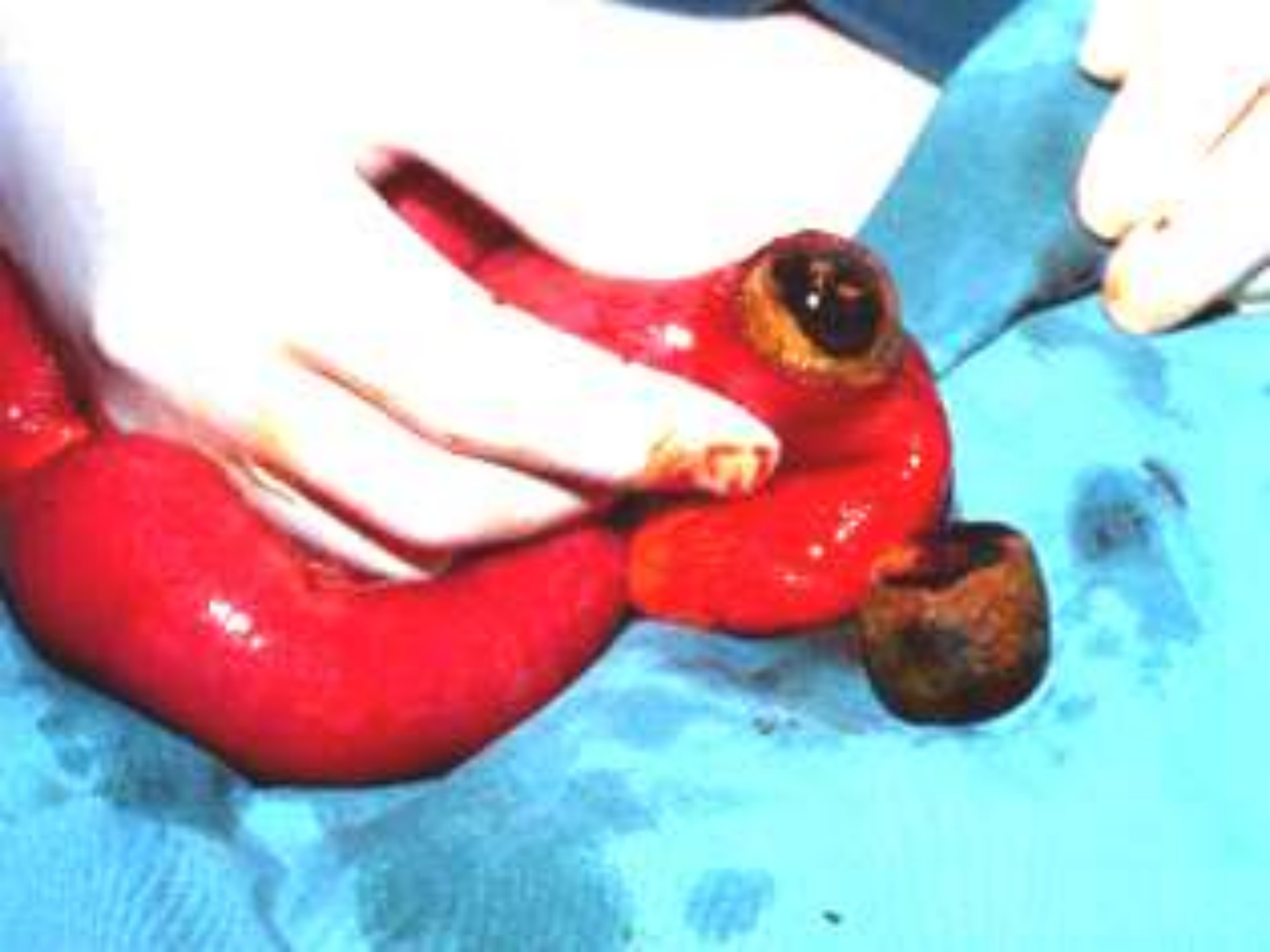
- Cholecystoduodedenal fistula.
- Impaction of gall stone 60 cm from ICV,
- Partial obstruction, ball – valve effect.
- Plain X ray: Rigler's Triad

(S.bowel obstruction, pneumobilia and an atypical mineral shadow) . 2 of 3.

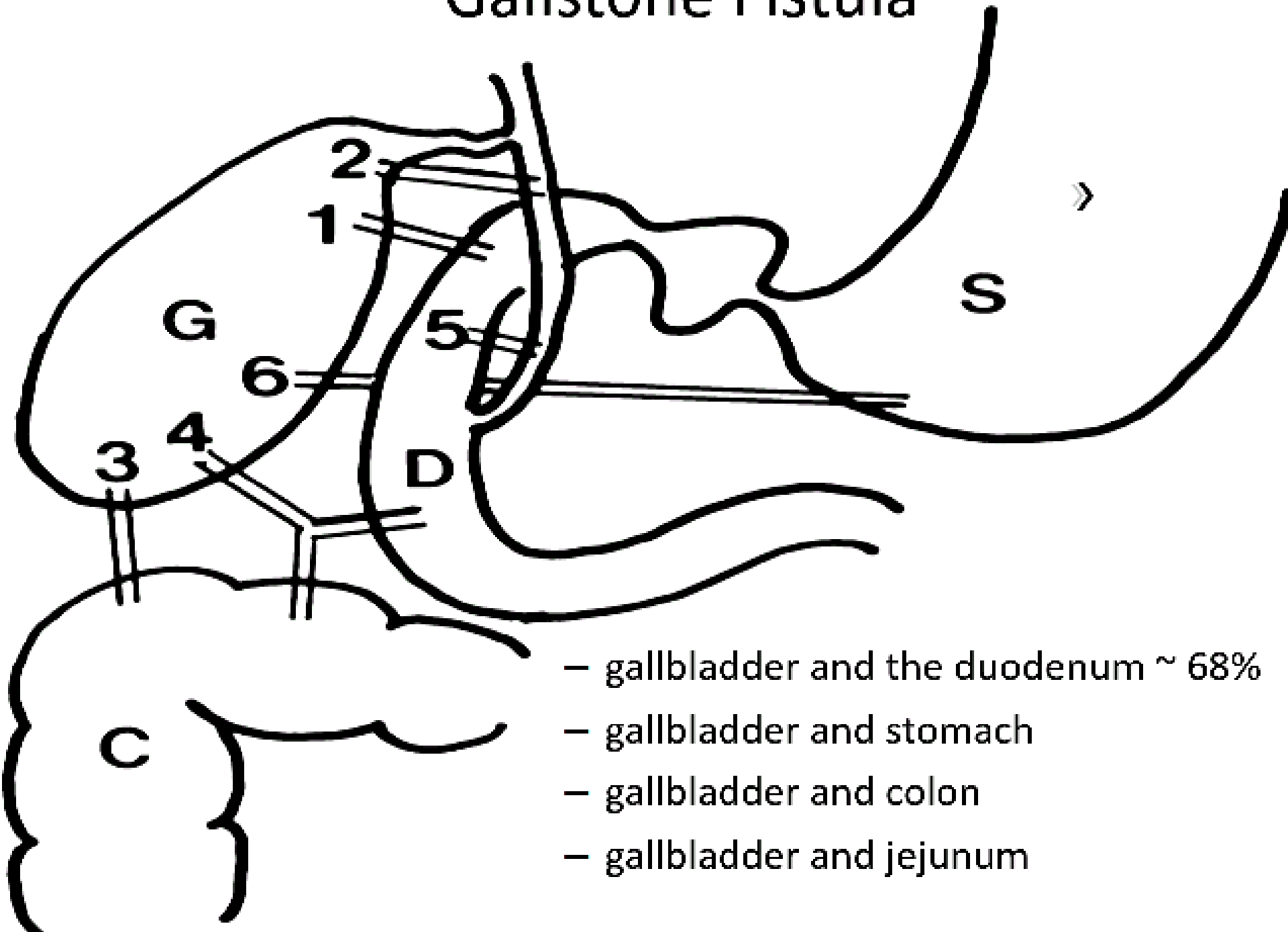
- Rx: Proximal milking (crush / enterotomy).


Gallstone
ileus
Gallbladder inflamed, distended, adherent to duodenum
Fistula formed; stone has passed into duodenum
Stone has passed down intestine; gallbladder contracted

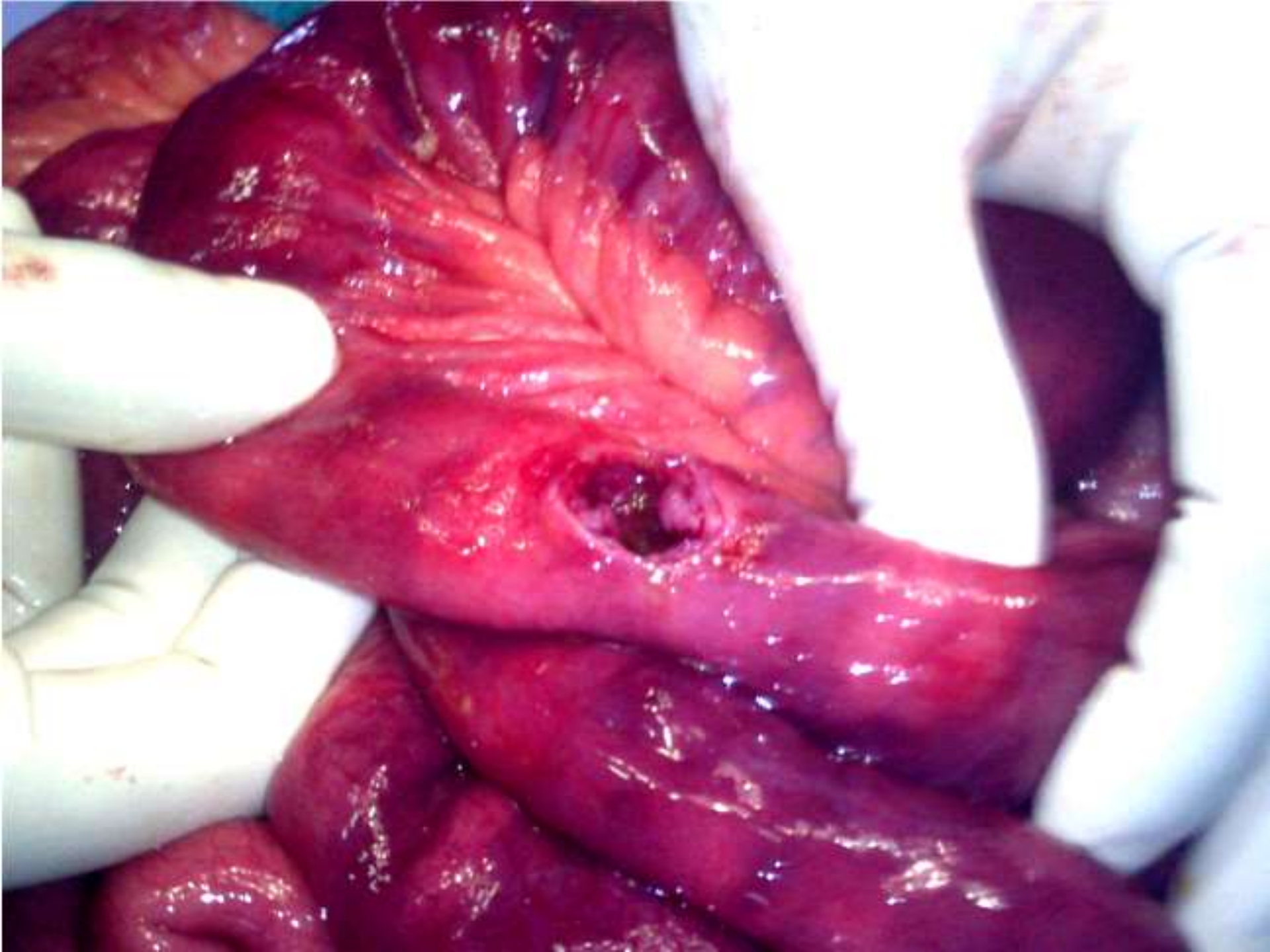

Gallstone Ileus
Mechanical disruption of the normal propulsive ability of the gastrointestinal tract.

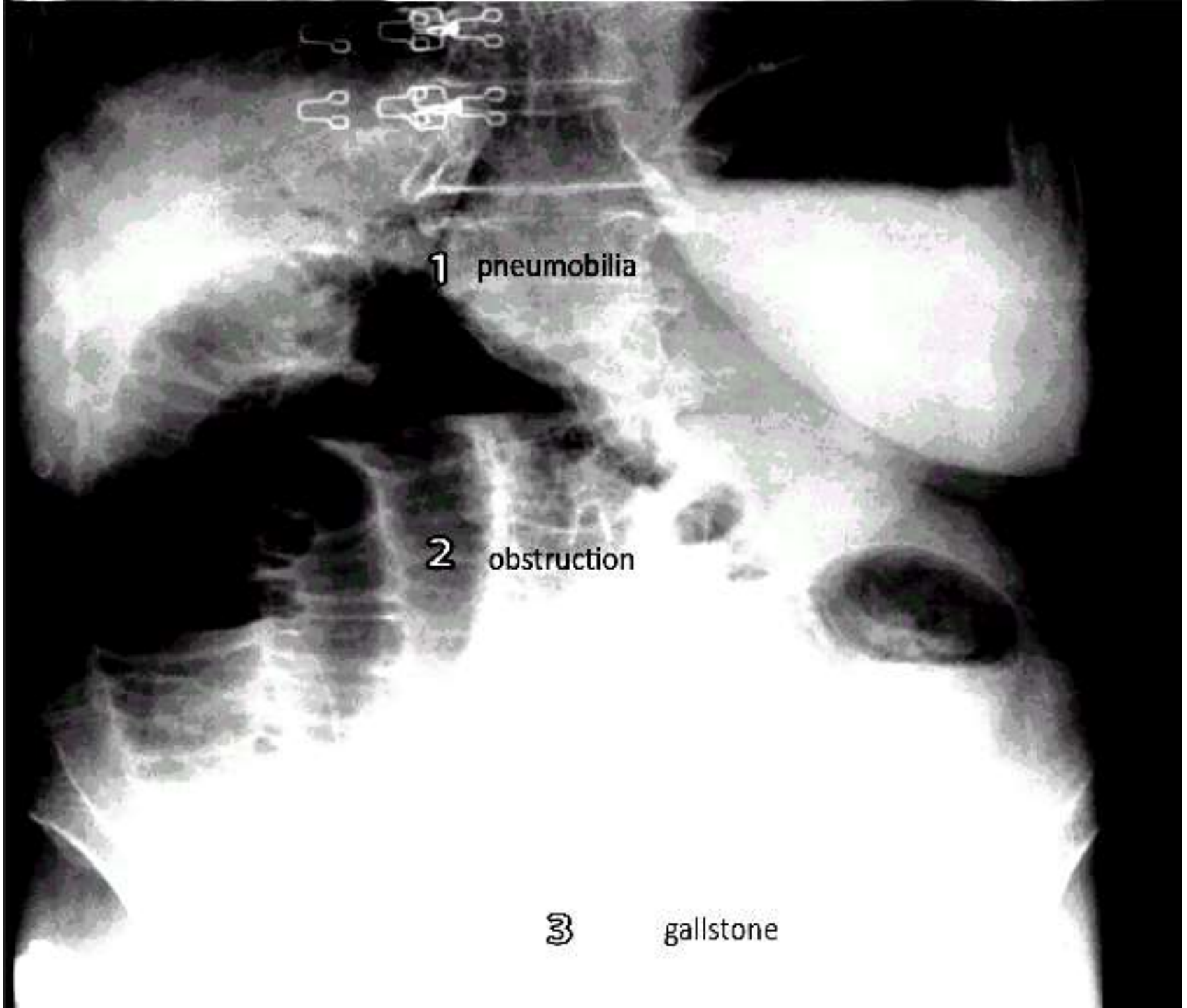


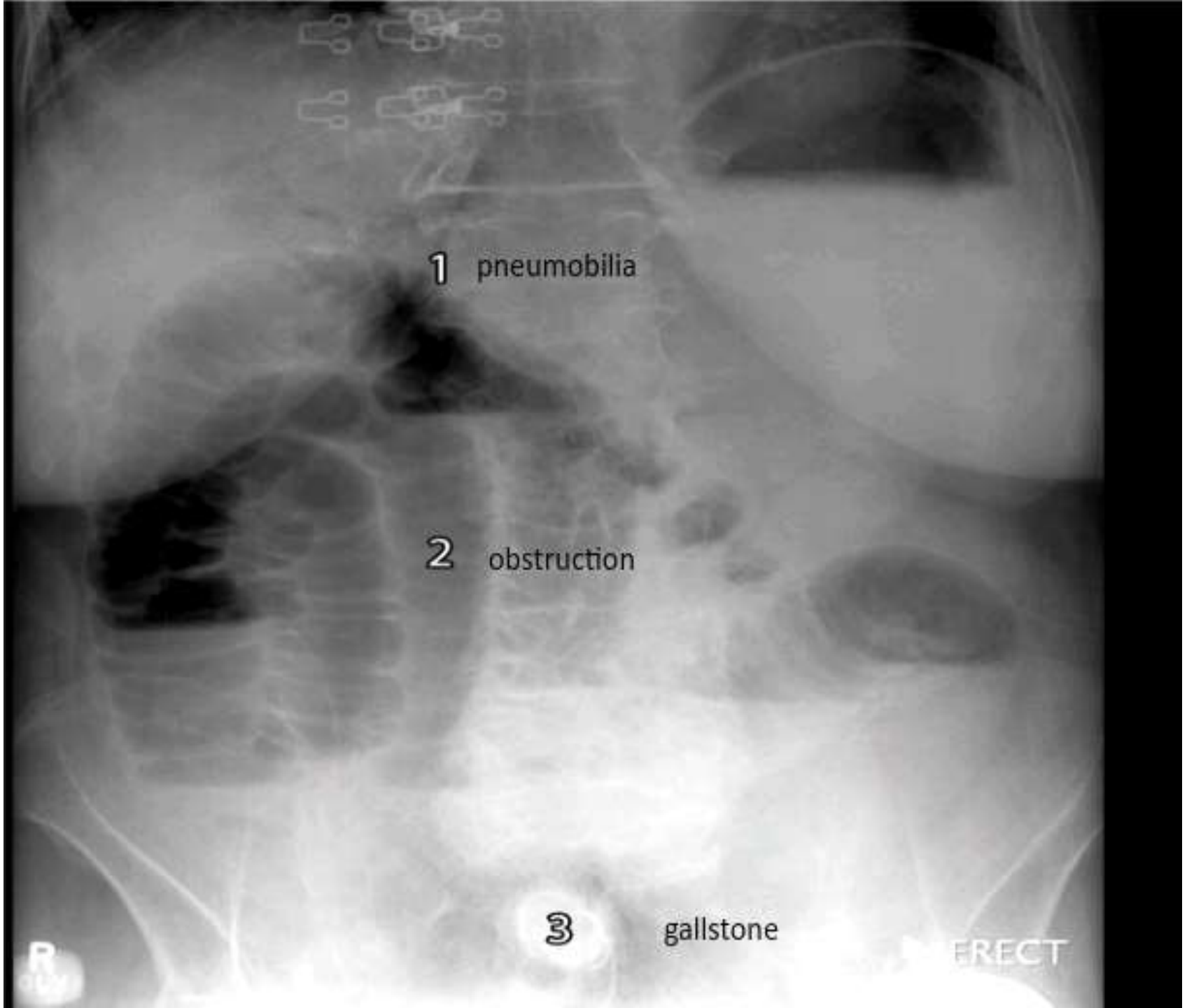
Gallstone Fistula

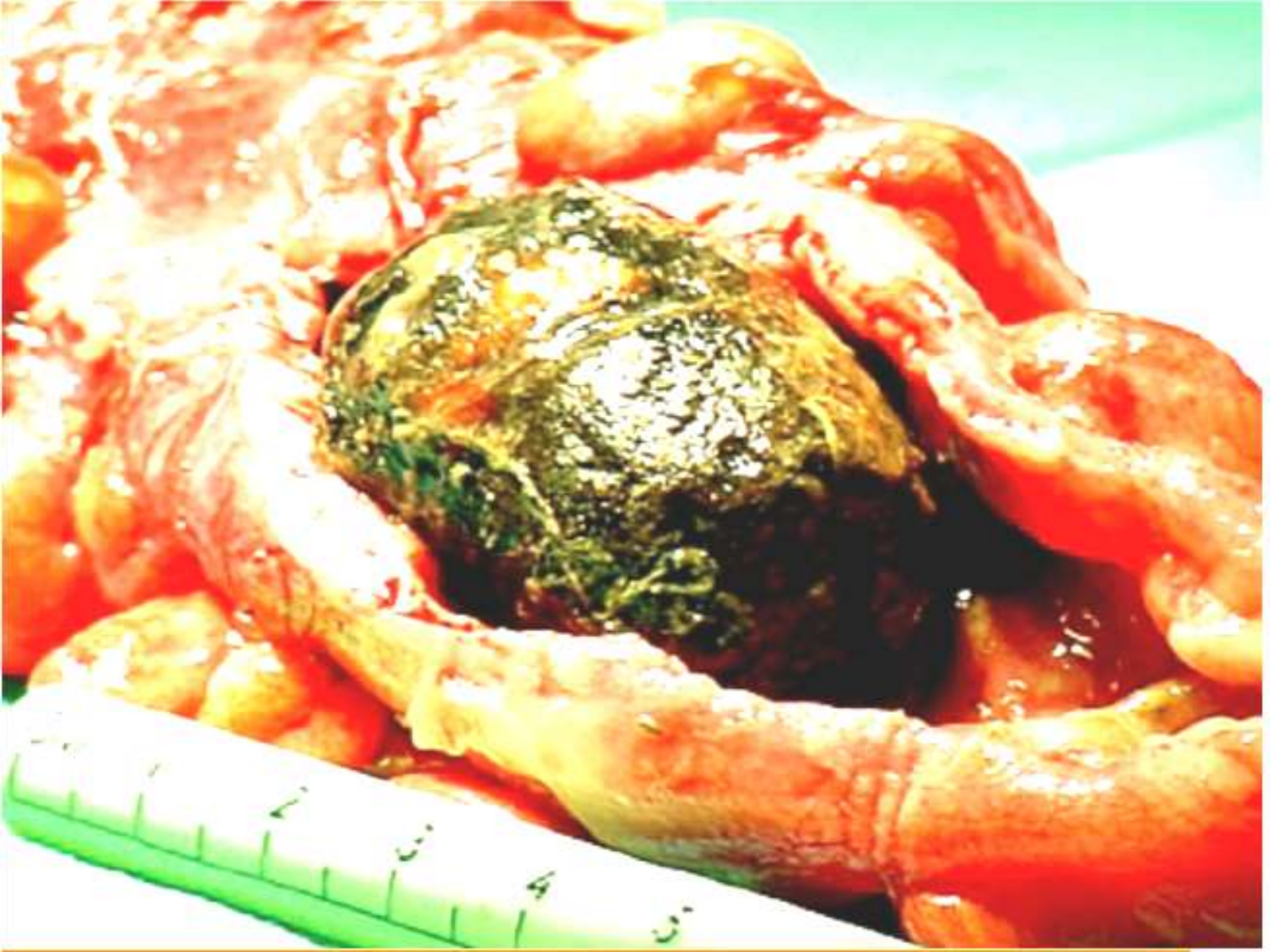


- gallbladder and the duodenum ~ 68%
- gallbladder and stomach
- gallbladder and colon
- gallbladder and jejunum




1 pneumobilia
2 obstruction
3 gallstone


1 pneumobilia
2 obstruction
3 gallstone
ERECT



BOLUS OBSTRUCTION

Food

-After Gatrectomy (unchewed articles passing directly to the s. bowel.

- Rx as above.

Trichobizoar & Phytobizore

- Trichobizoar : Hair chewing.(Psychological).
- Phytobizore : Food.

Stercolith

- Jujenal diverticuum & ileal stricure

Worms

- Ascariasis.
- Caecal mass.

ENTERIC STRICTURE

- Intramural.

Benign

T.B., Crohn's disease, anastomosis.

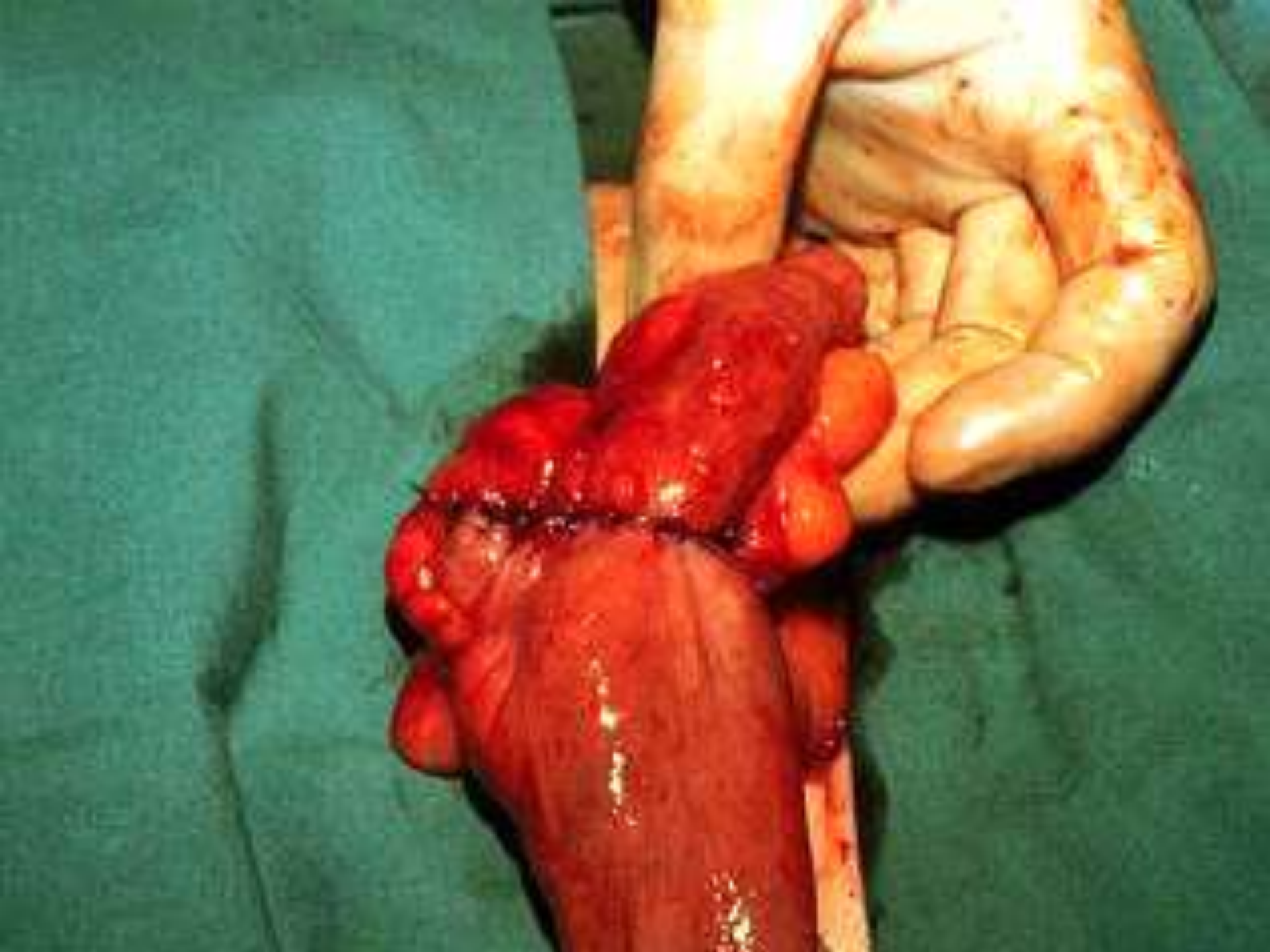
Malignant

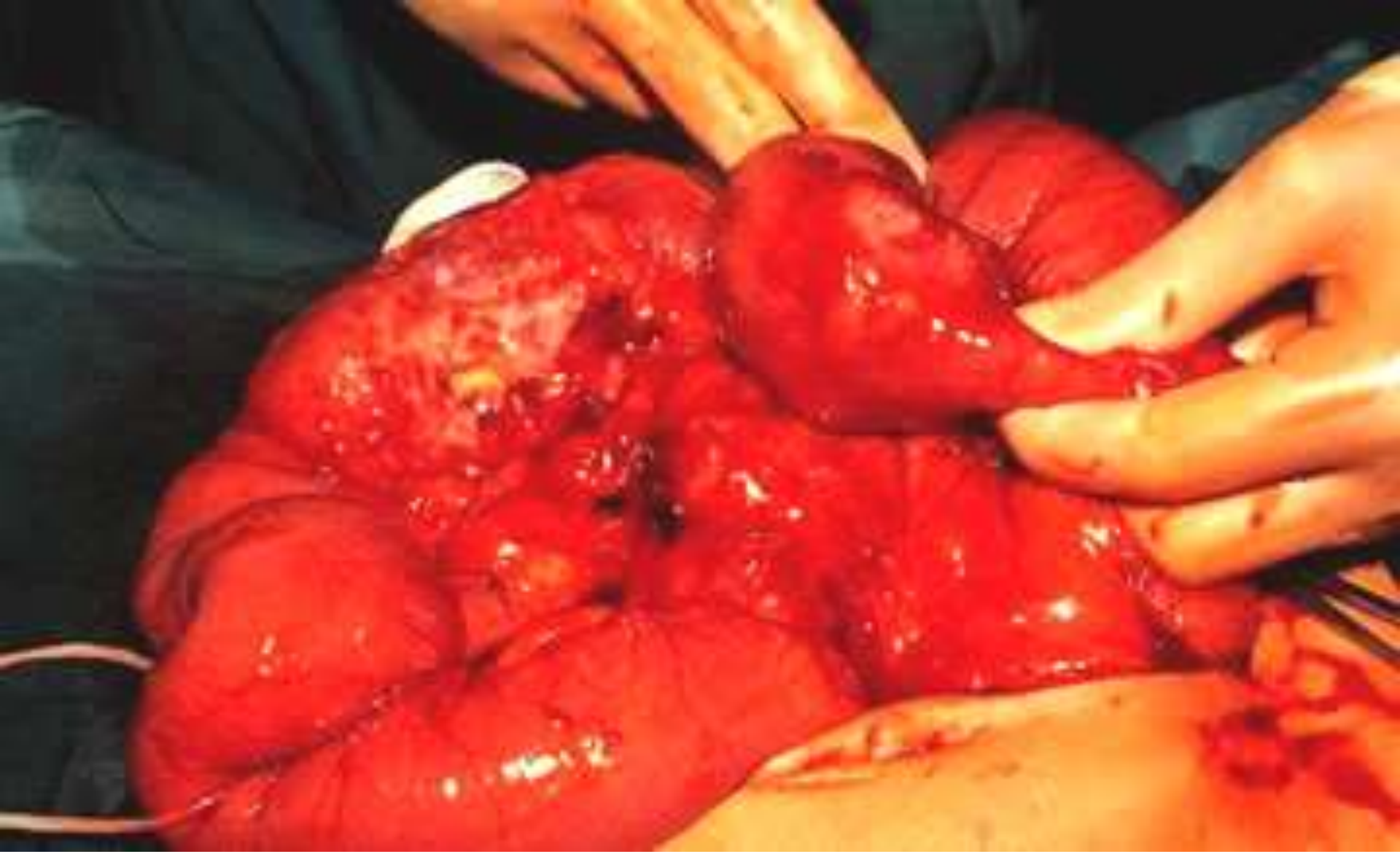
Carcinoma, Sarcoma & Lymphoma

Rx

-Stricturoplasty.

- Resection & Reanastomosis.



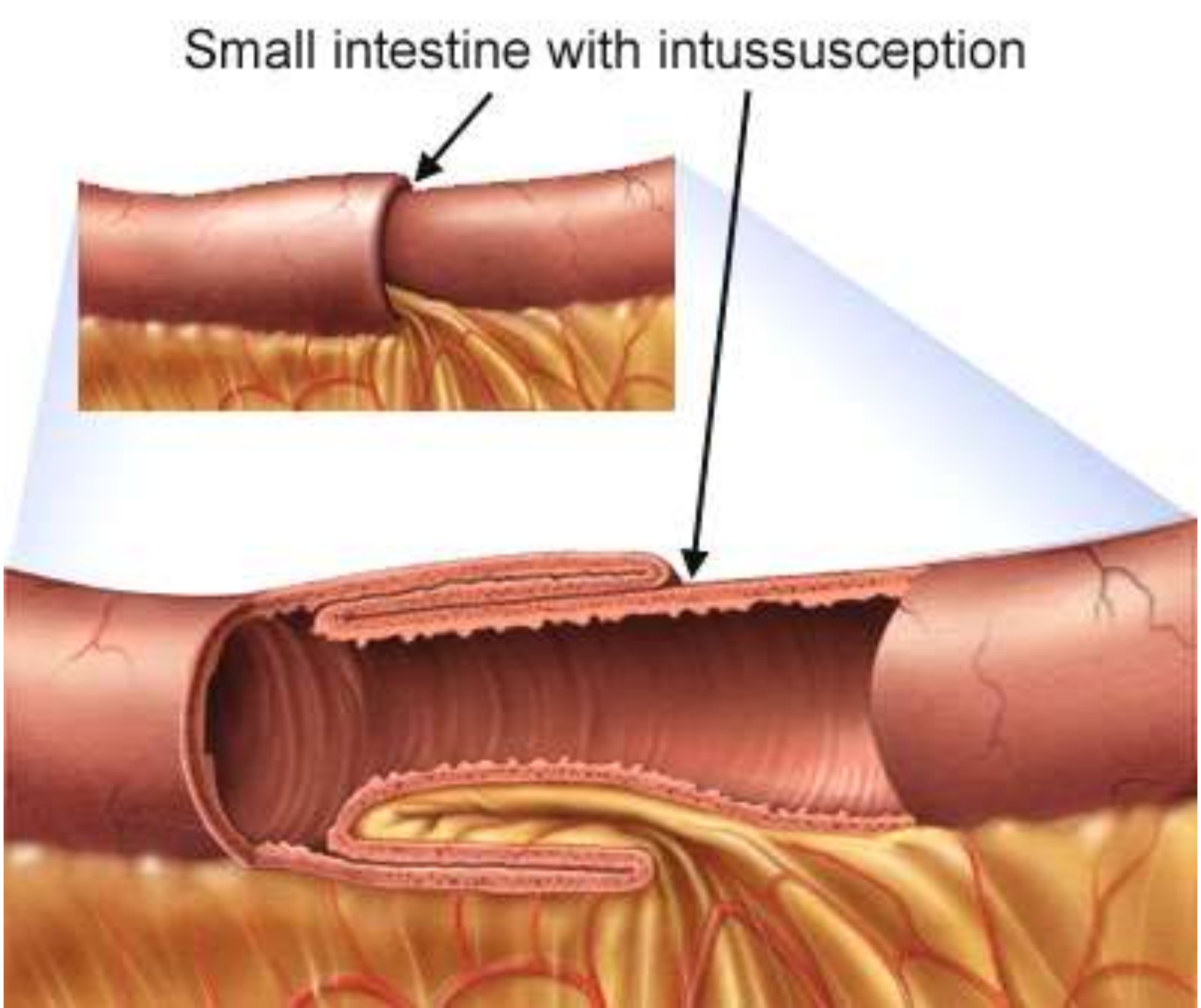


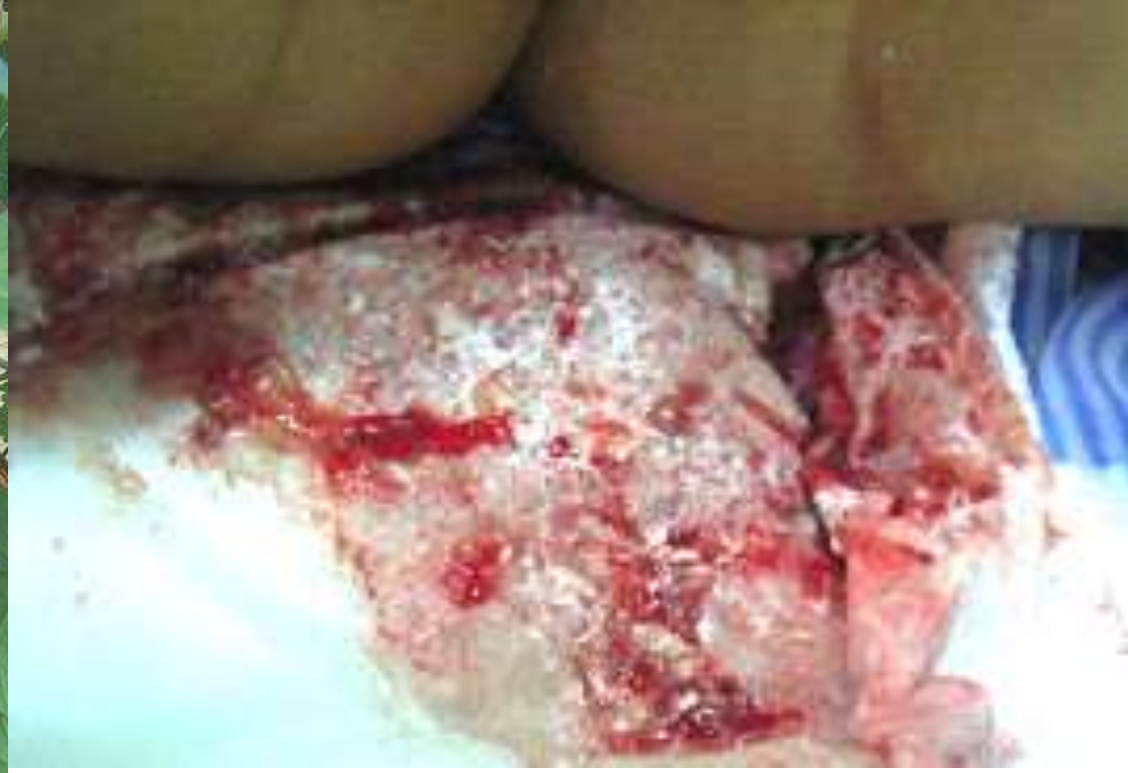
Lymphoma of small bowel

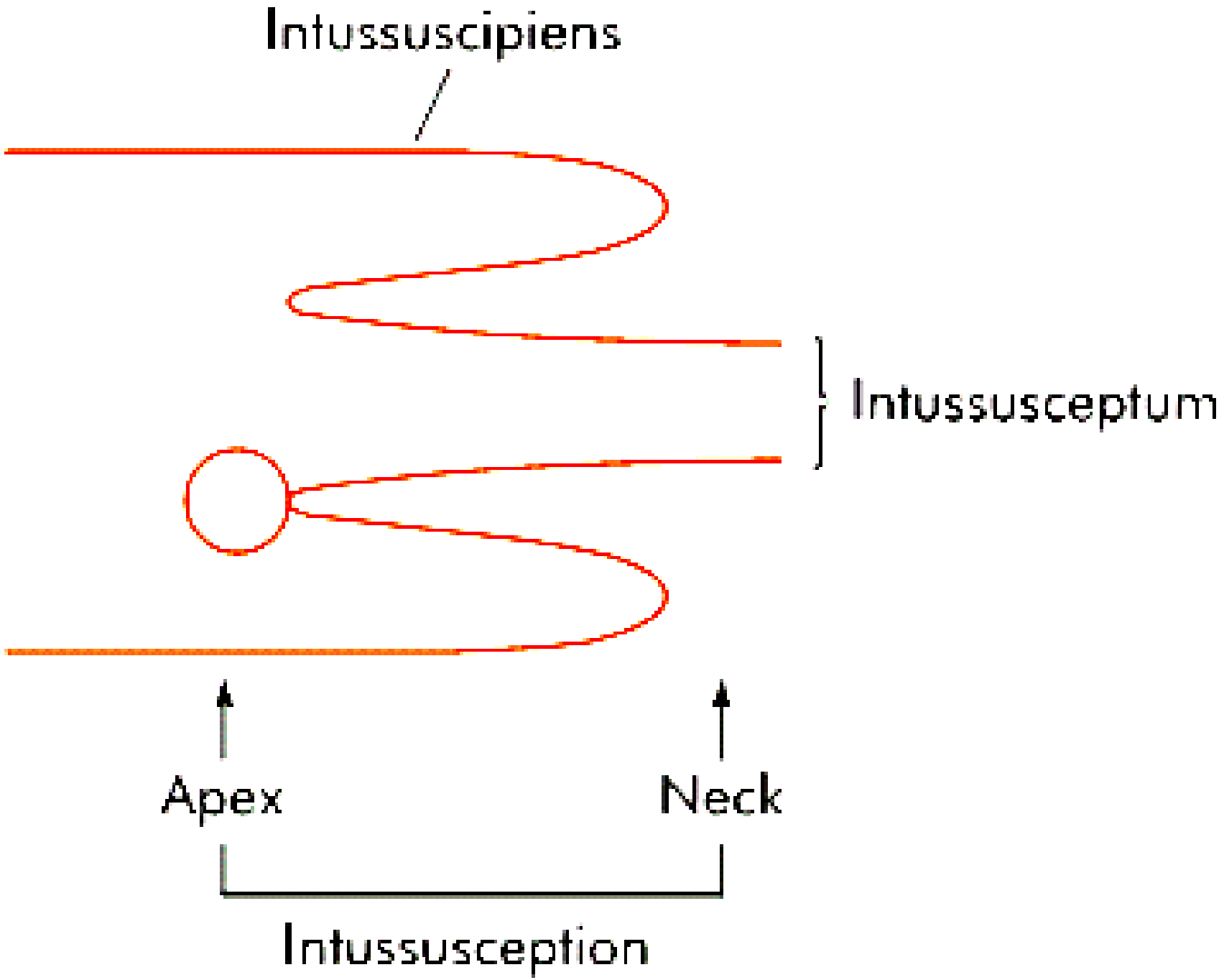
INTUSSUSCEPTION

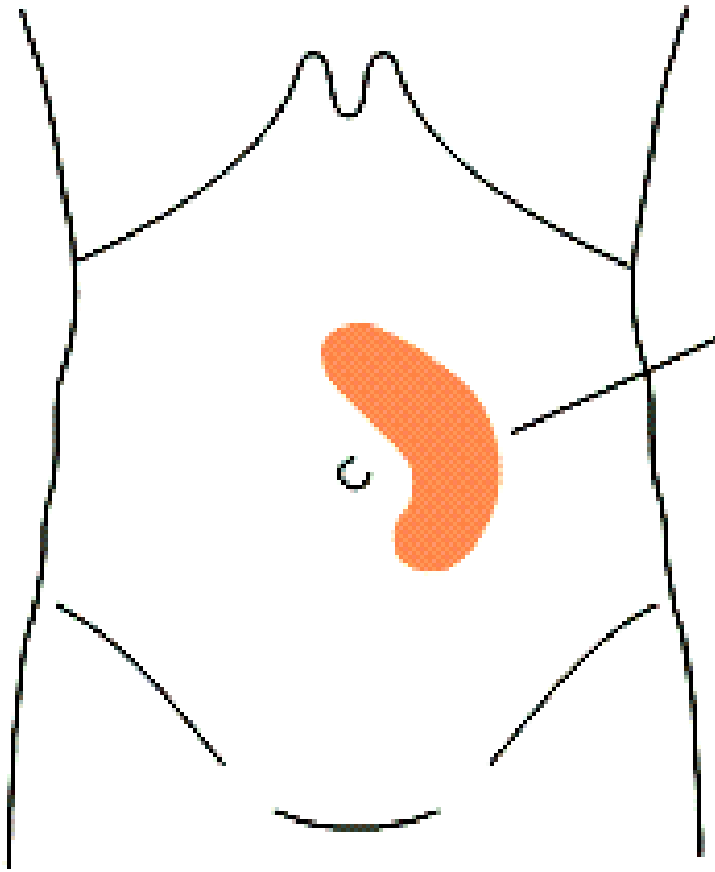
-Invagination of proximal segment to distal segment.

- Could be :
  - Idiopathic (5^{th} -9^{th}) month, 90 %, Peyer's patches.
  - 2^{nd} > 2 years. (pathological lead point), Iliocolic.
  - Adult (polyp,submucosal lipoma & other tumour).Colocolic.
- Redcurrant jelly stool
- Dx : Mass, Empty Rt.I.F.(Dance's sign), C.T. scan Target sign.

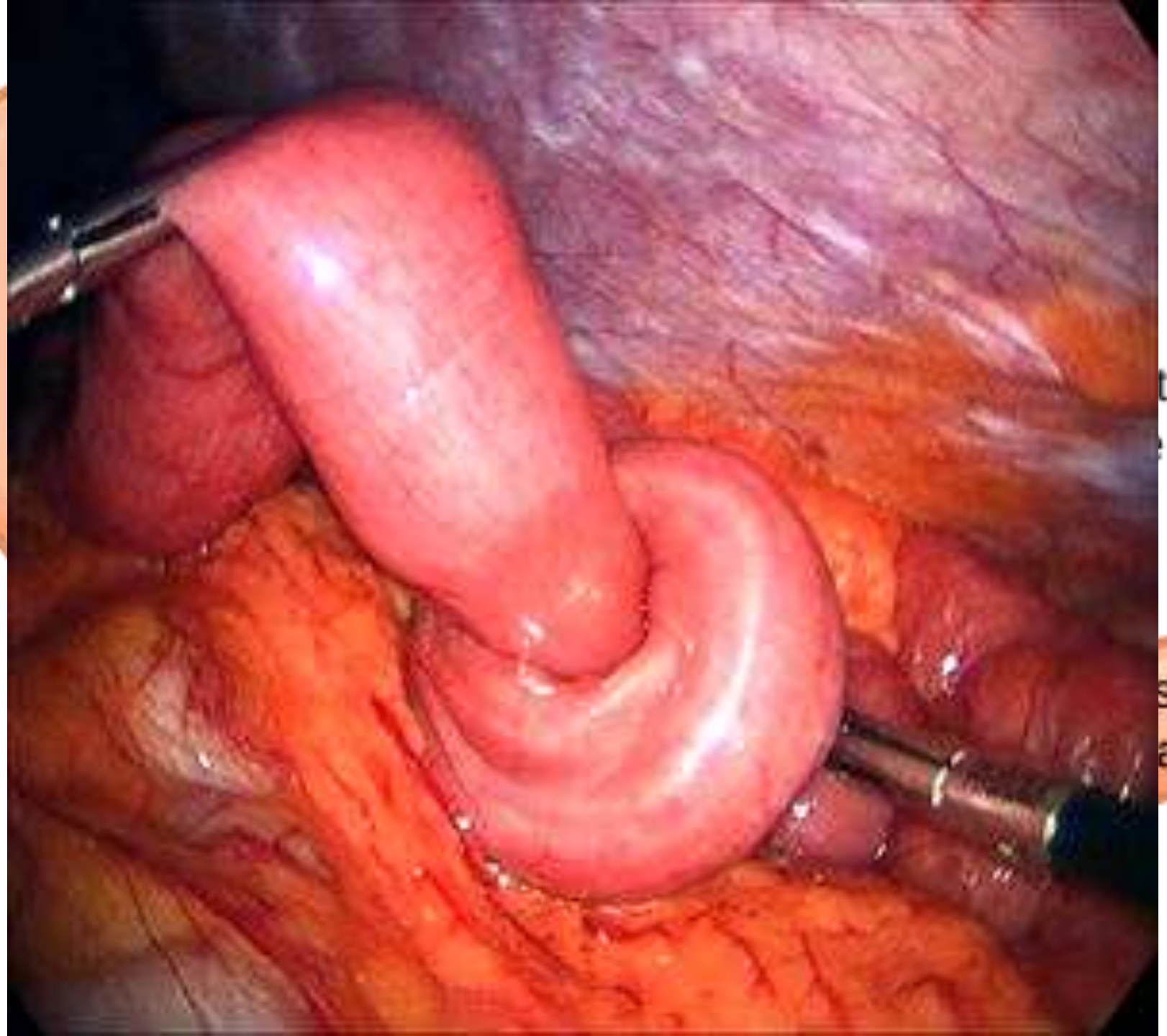

Small intestine with intussusception




Intussuscipiens
Intussusceptum
Apex
Neck
Intussusception

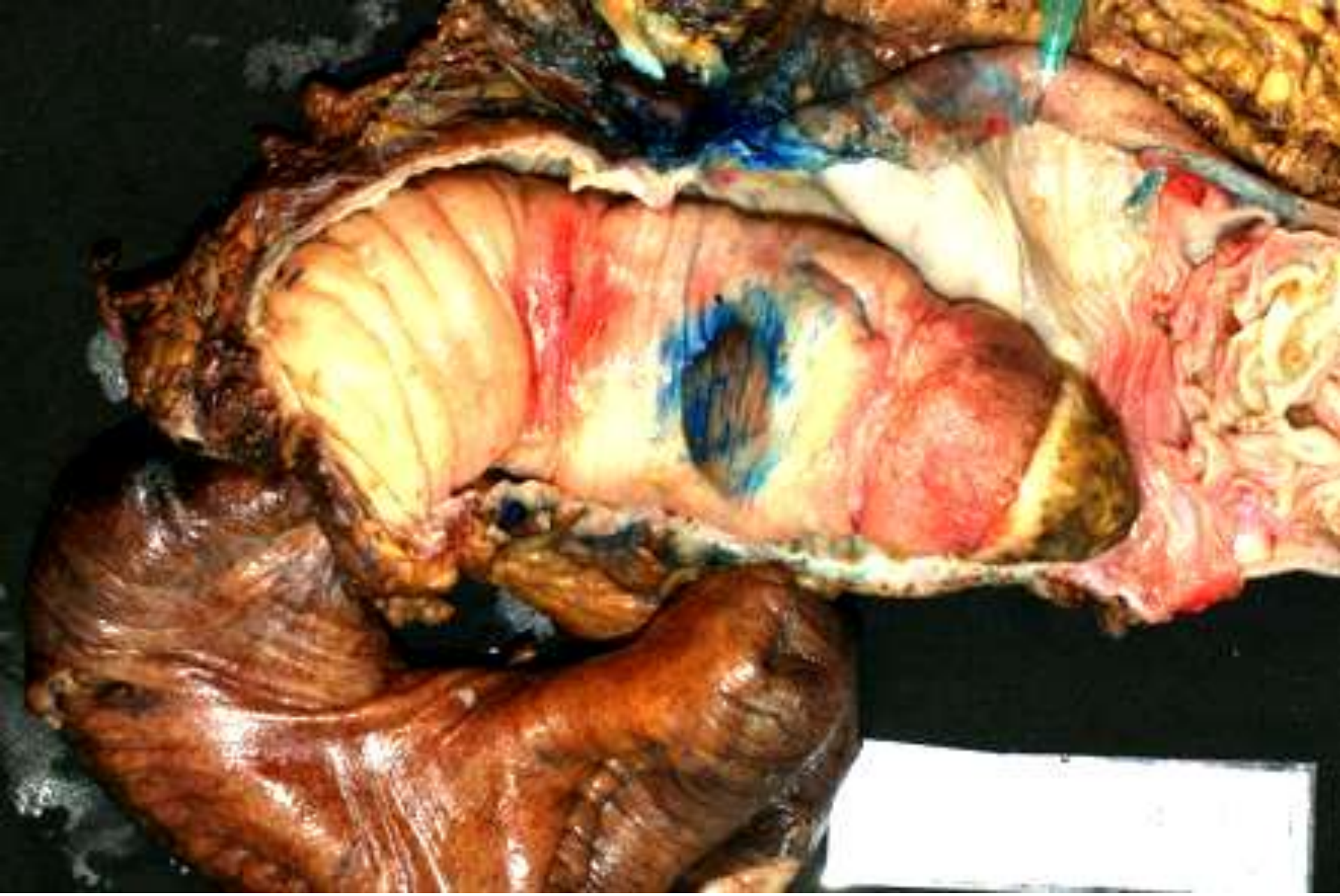


Sausage-shaped lump. Concavity towards the umbilicus

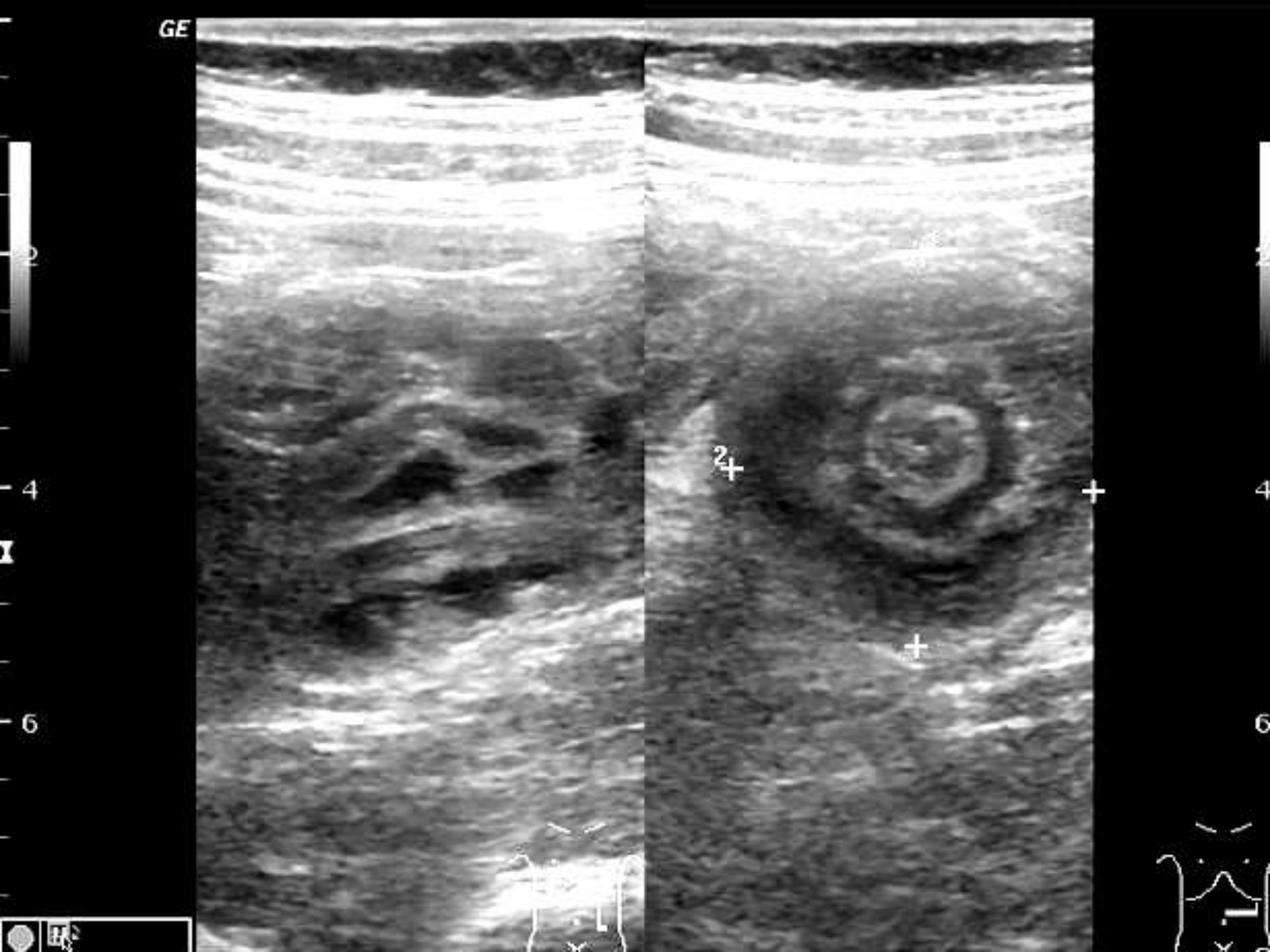


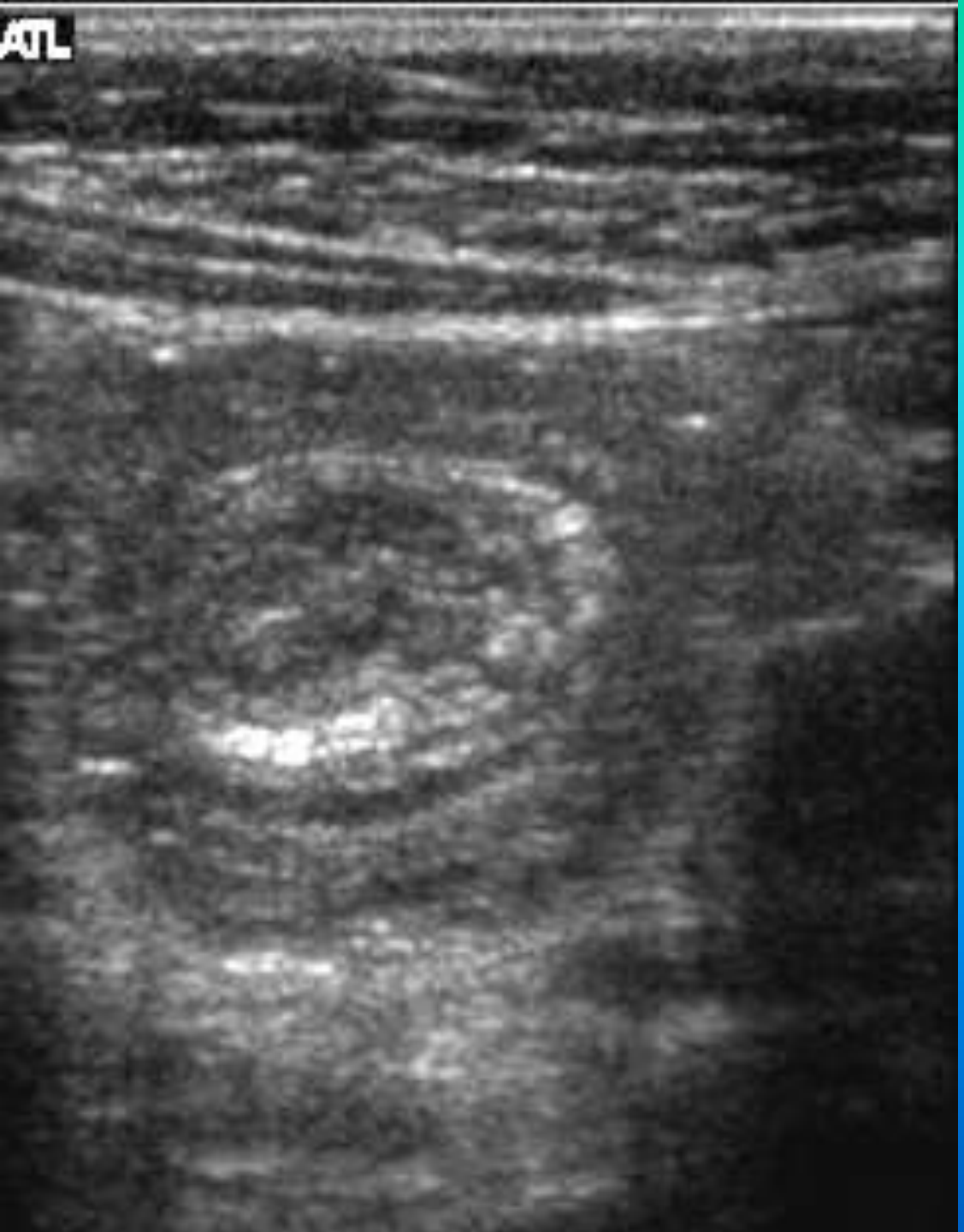
Types of intussusception in children (after RE Gross) ($n = 702$).

	Percentage of series
Ileoileal	5
Ileocolic	77
Ileoileocolic	12
Colocolic	2
Multiple	1
Retrograde	0.2
Others	2.8



Extended right hemicolectomy (transverse colon opened) with necrotic caecal mucosal mass and prolapsing caecum/ascending colon.


GE
2
4
6
2


ATL

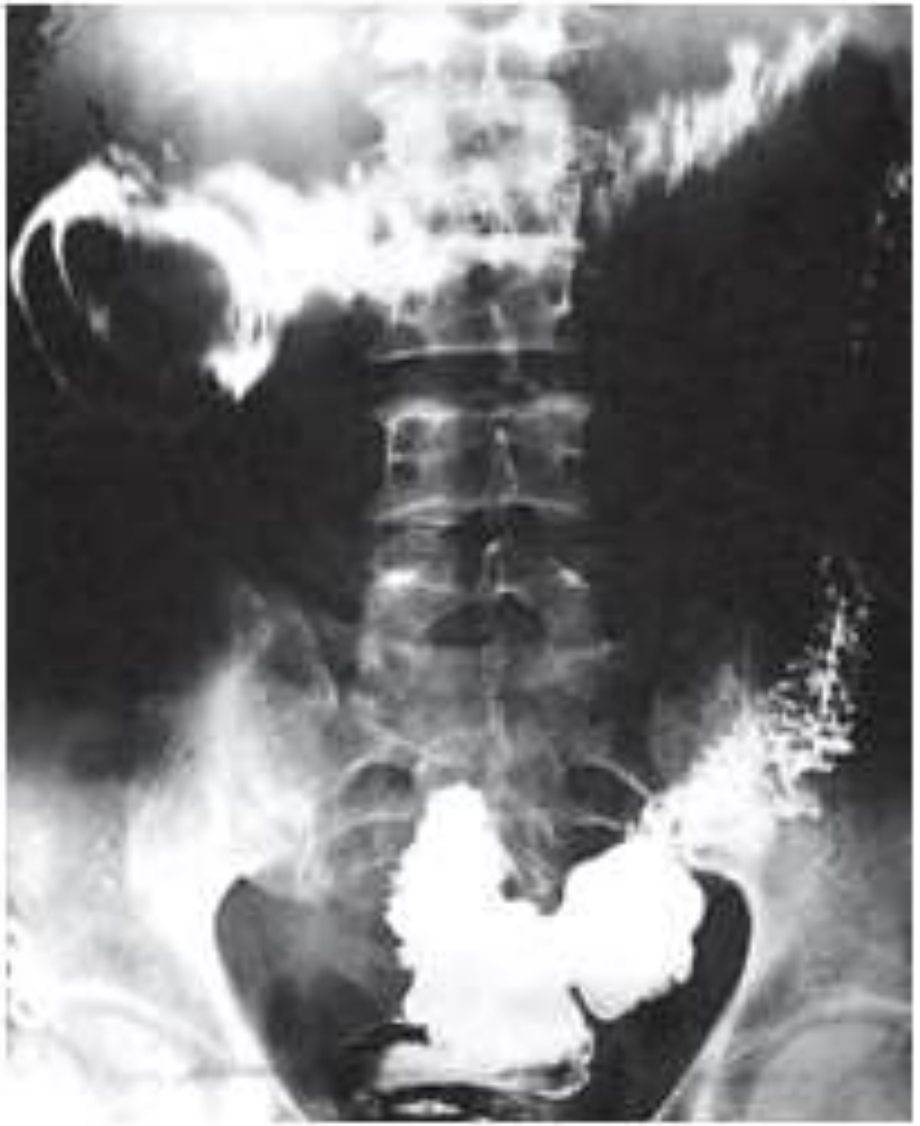
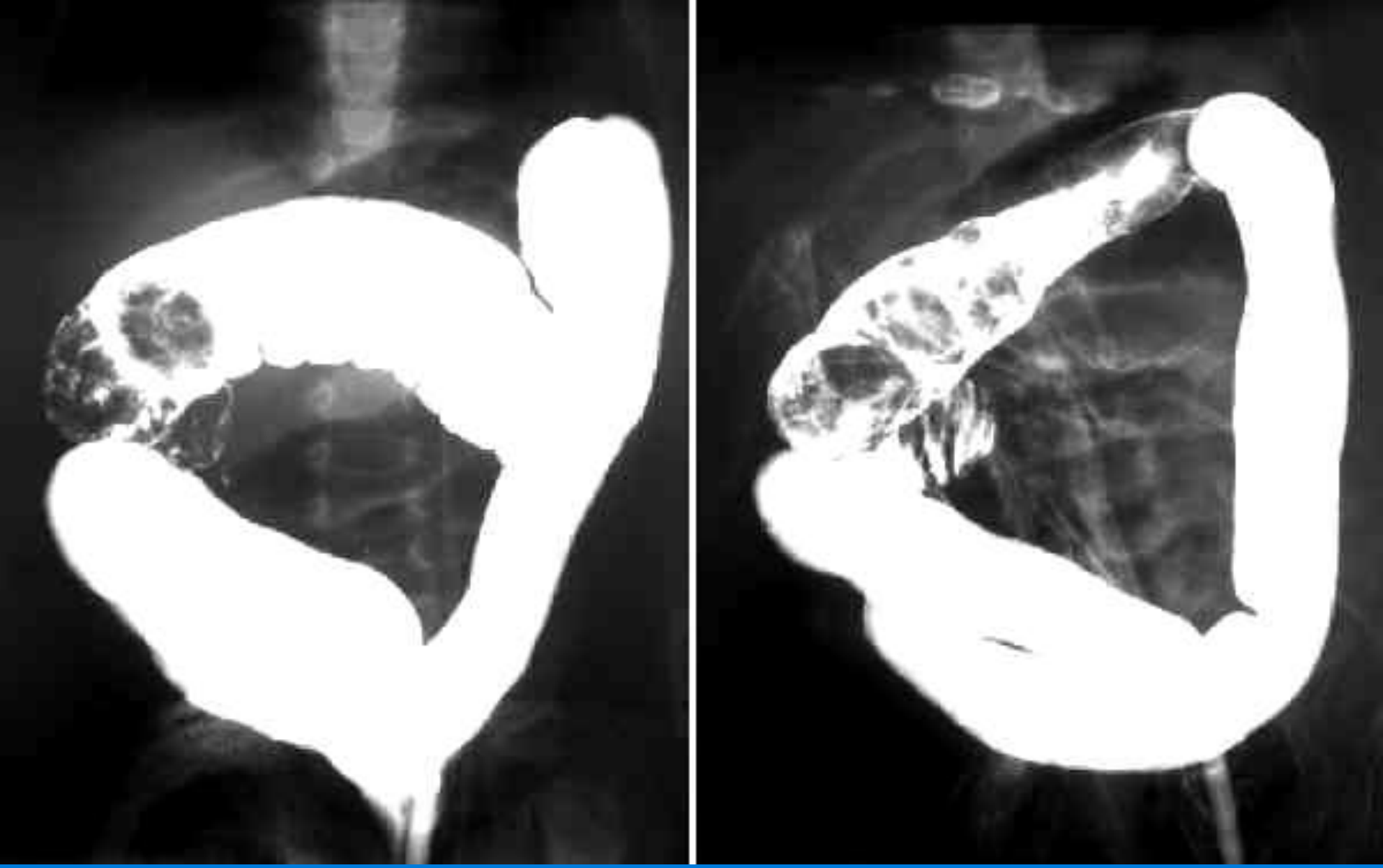
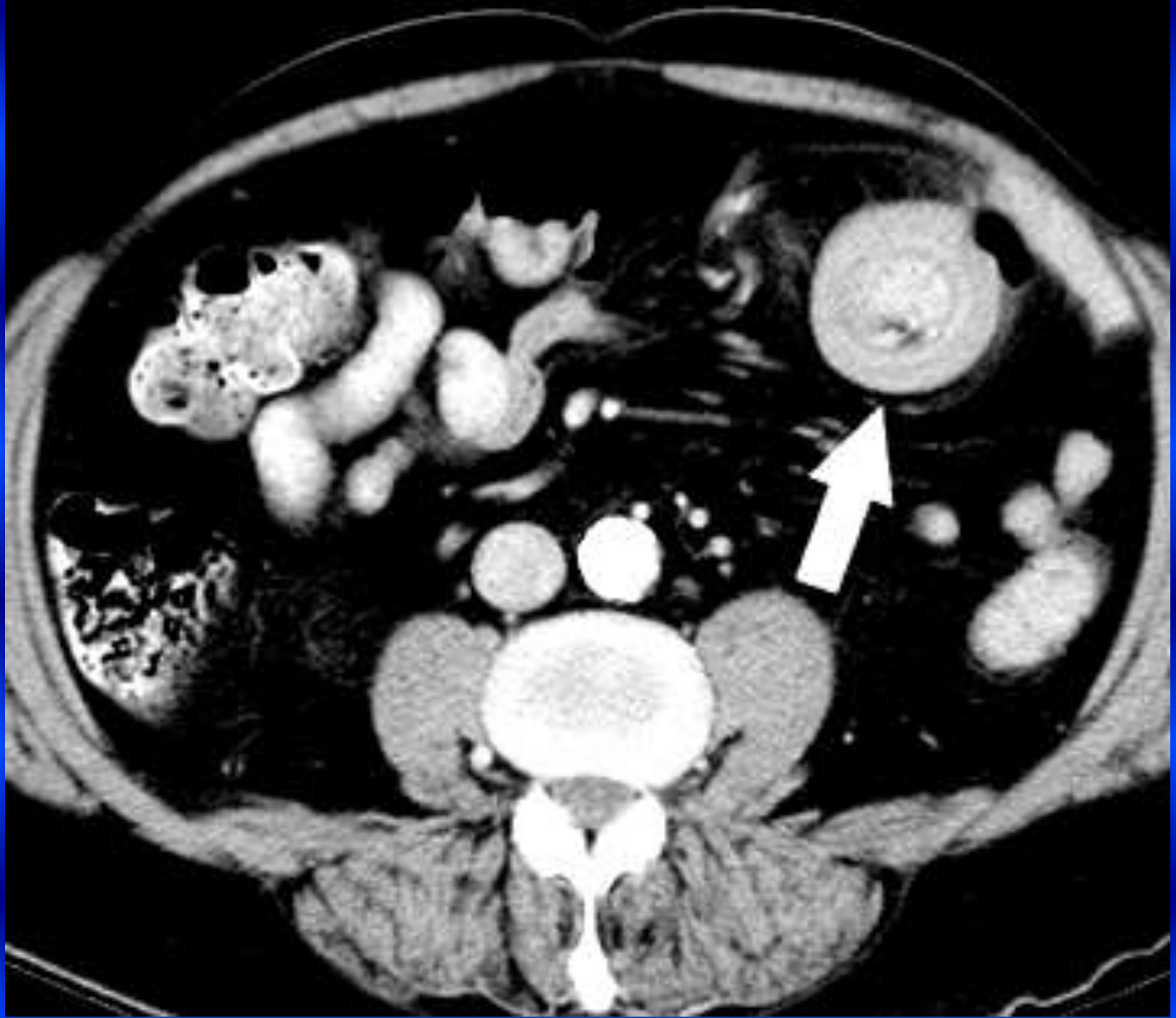
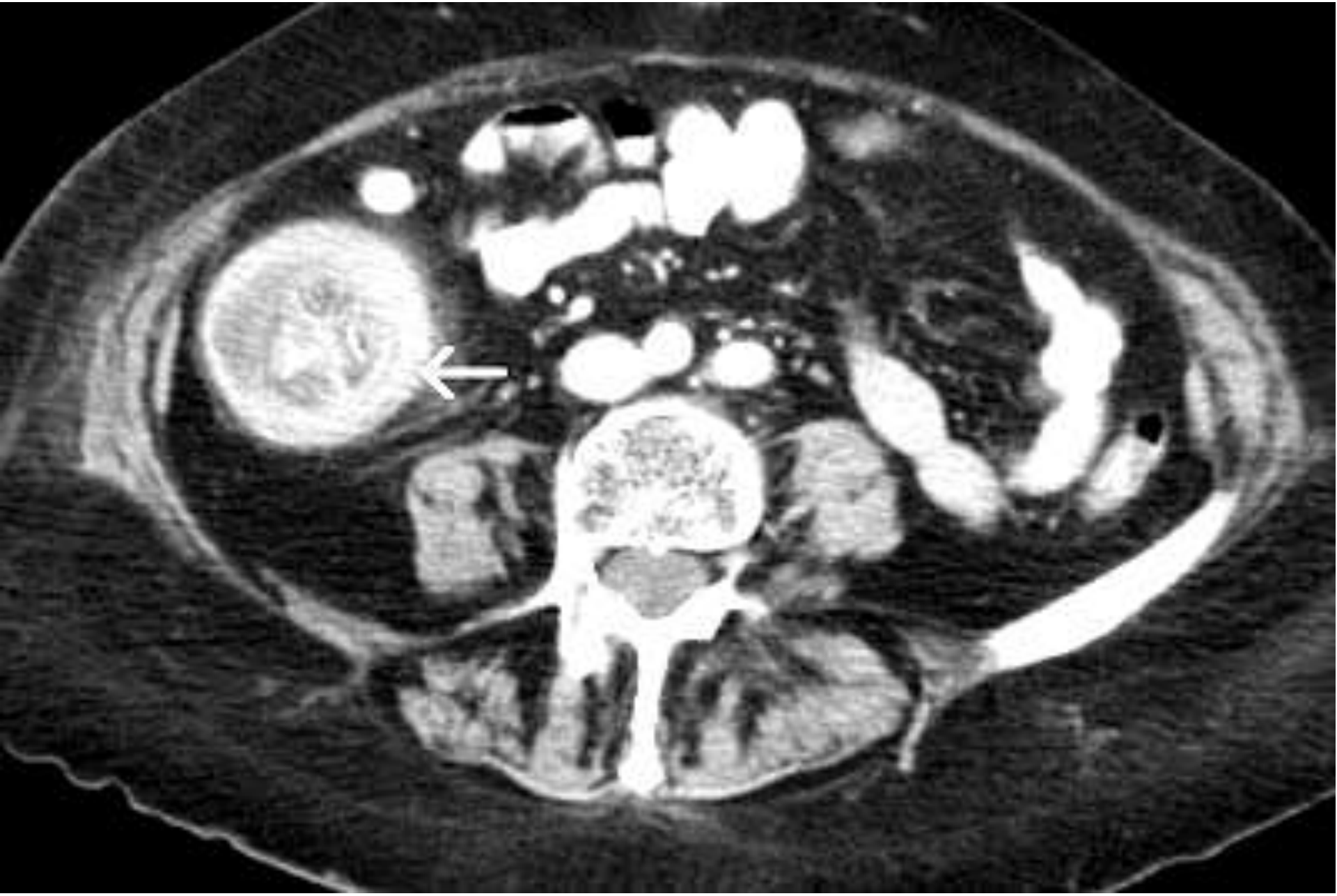


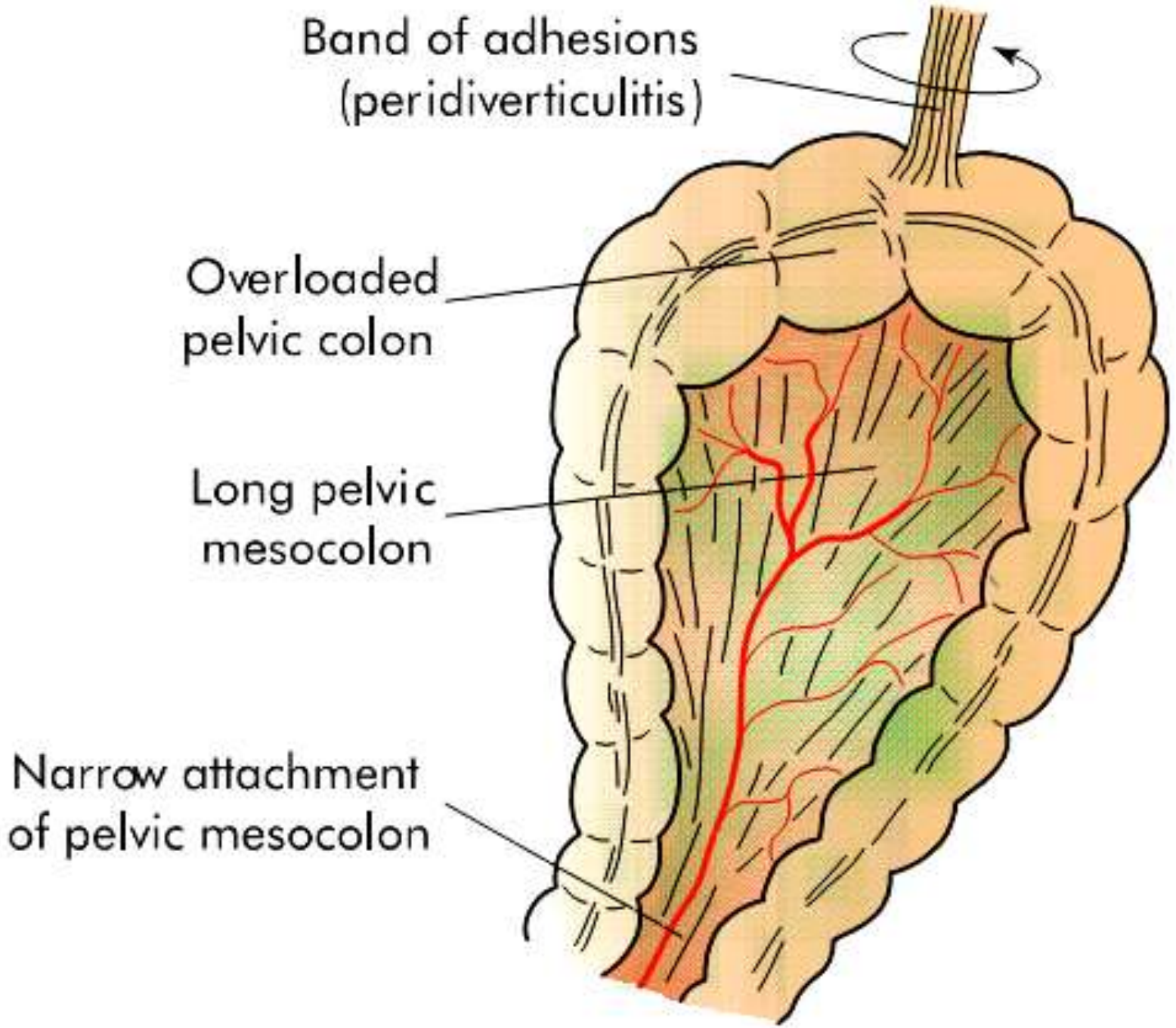
Figure 70.13 'Claw' sign of iliac intussusception. The barium in the intussusception is seen as a claw around a negative shadow of the intussusception (courtesy of RS Naik, Durg, India).

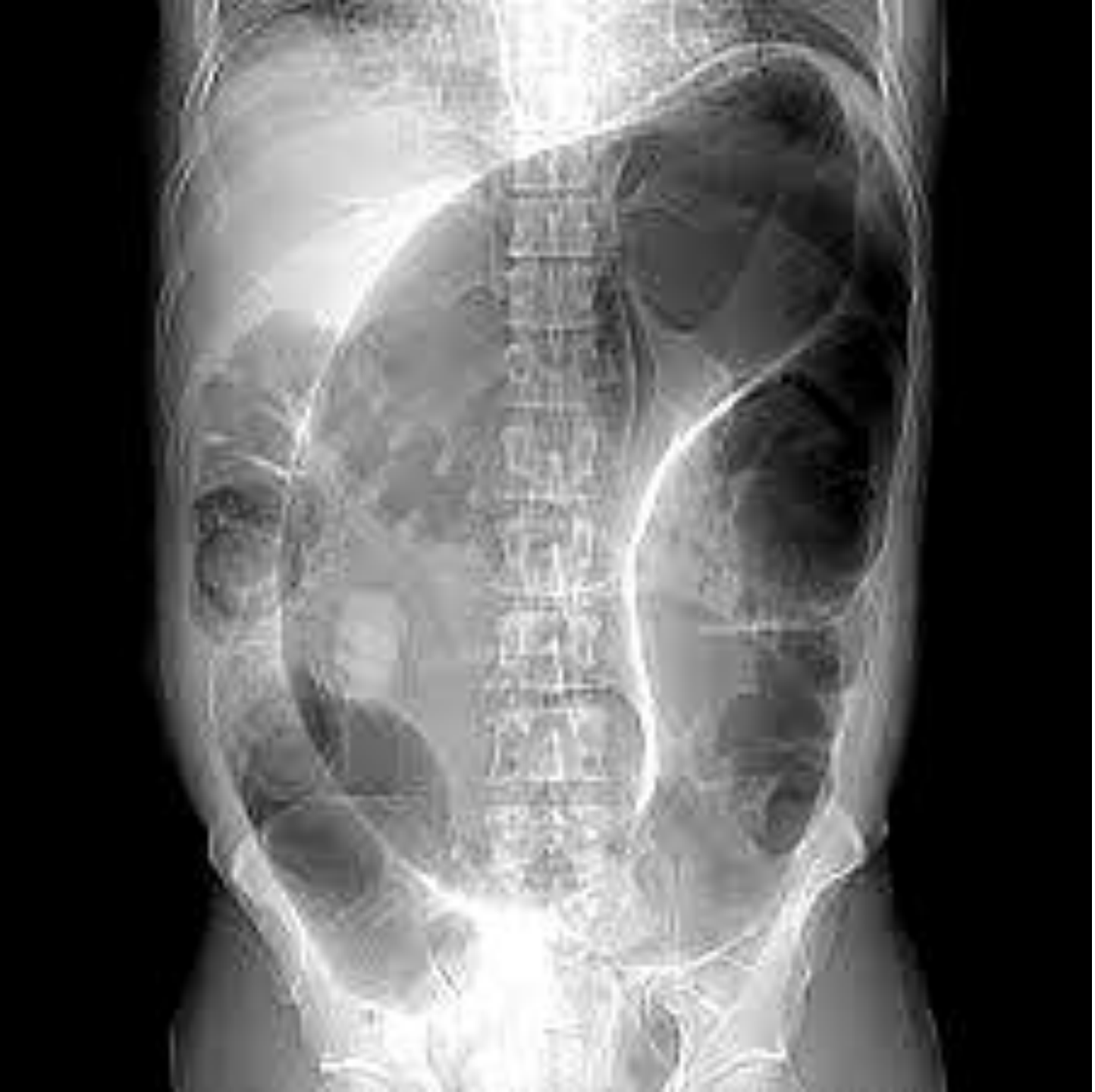




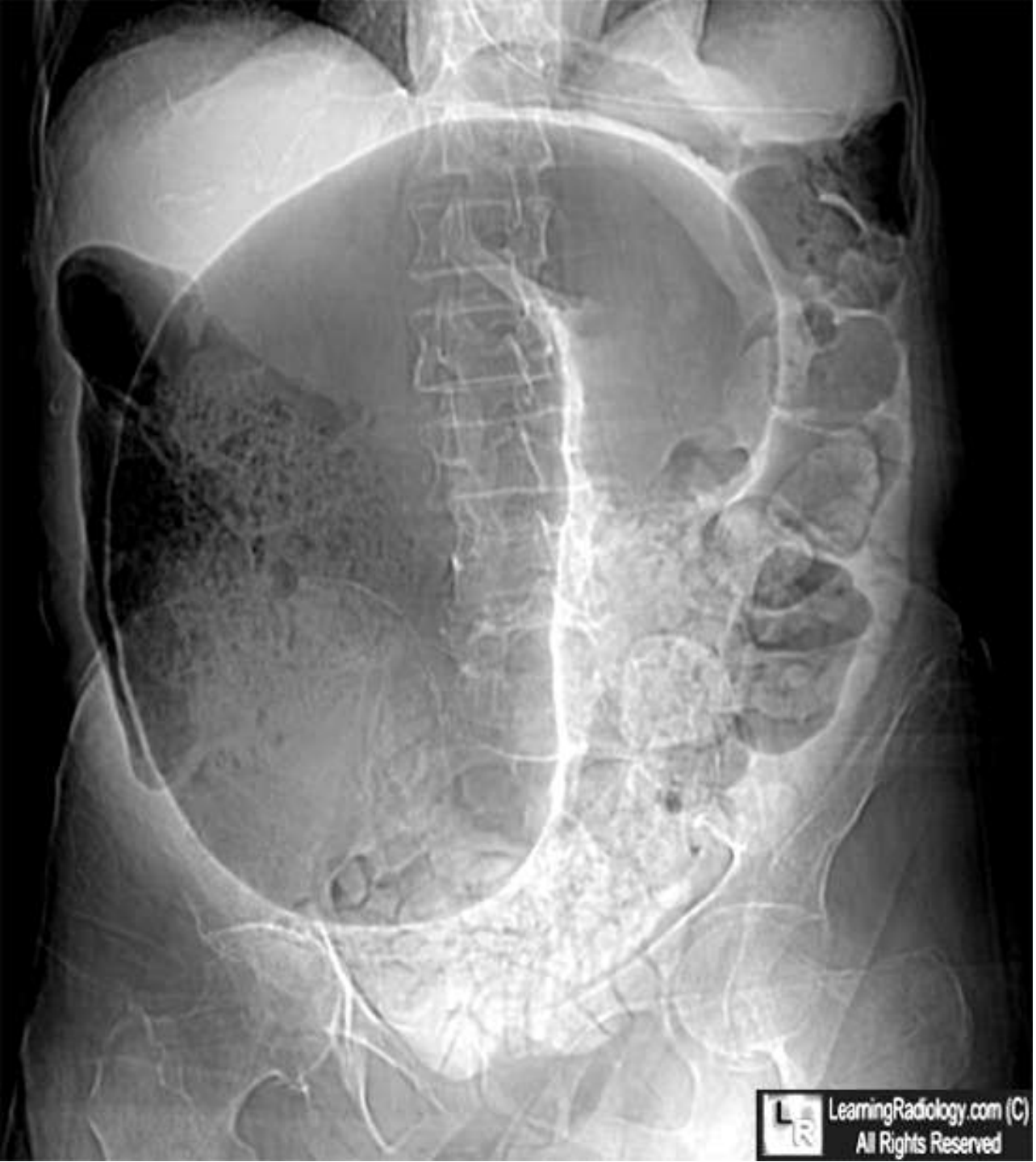


Sigmoid Volvulus


Band of adhesions
(peridiverticulitis)
Overloaded
pelvic colon
Long pelvic
mesocolon
Narrow attachment
of pelvic mesocolon



Coffee-bean sign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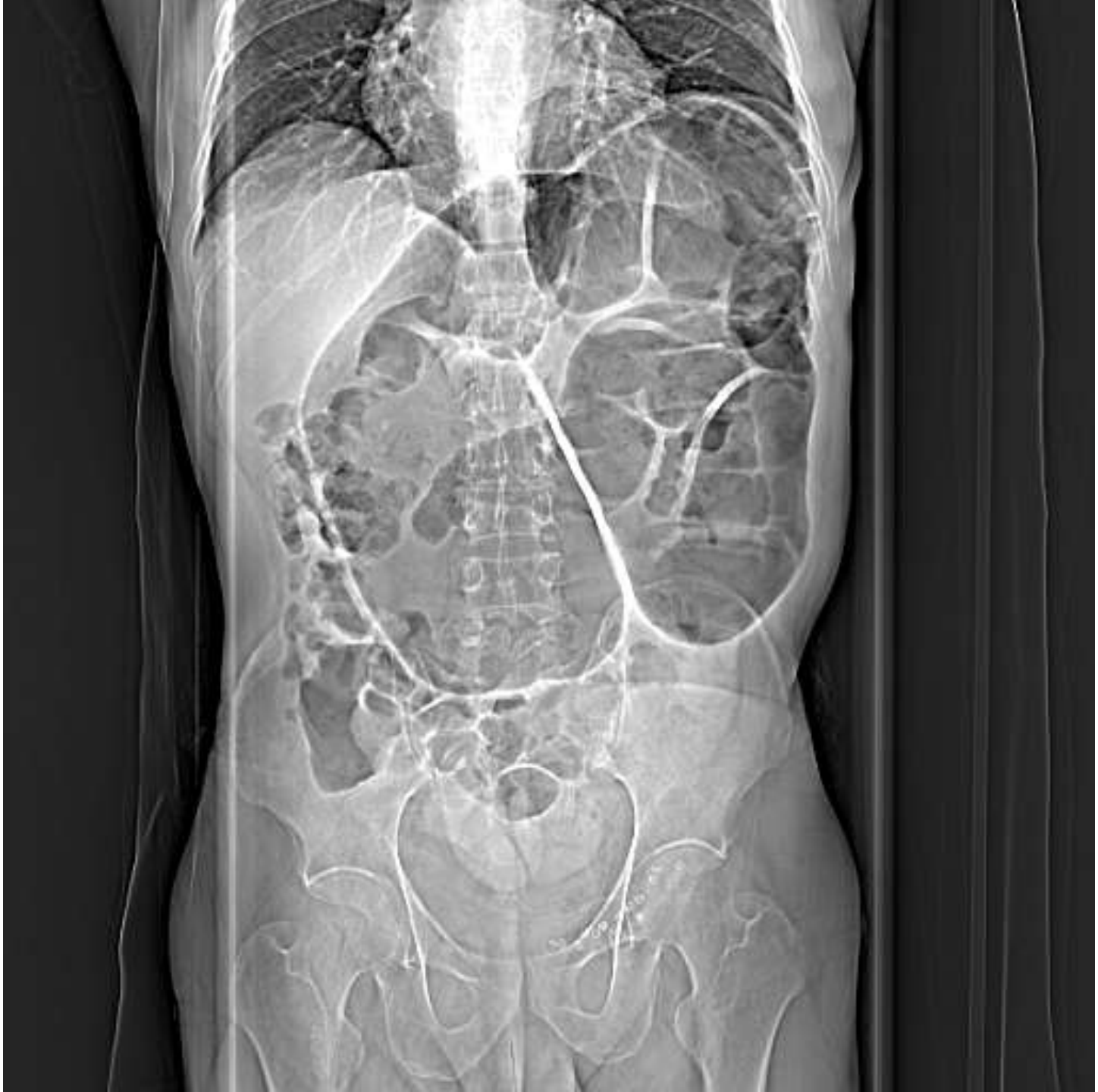
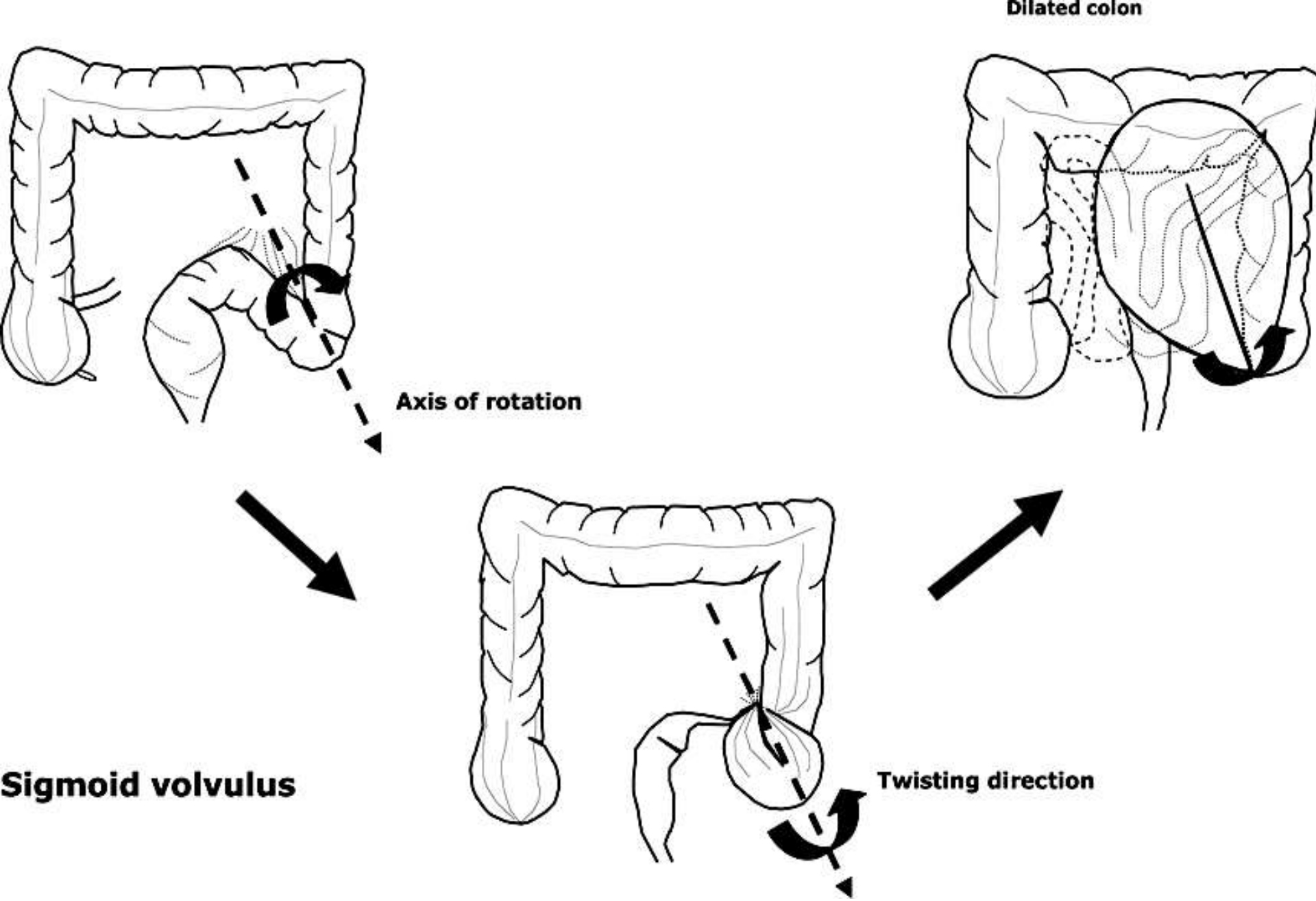
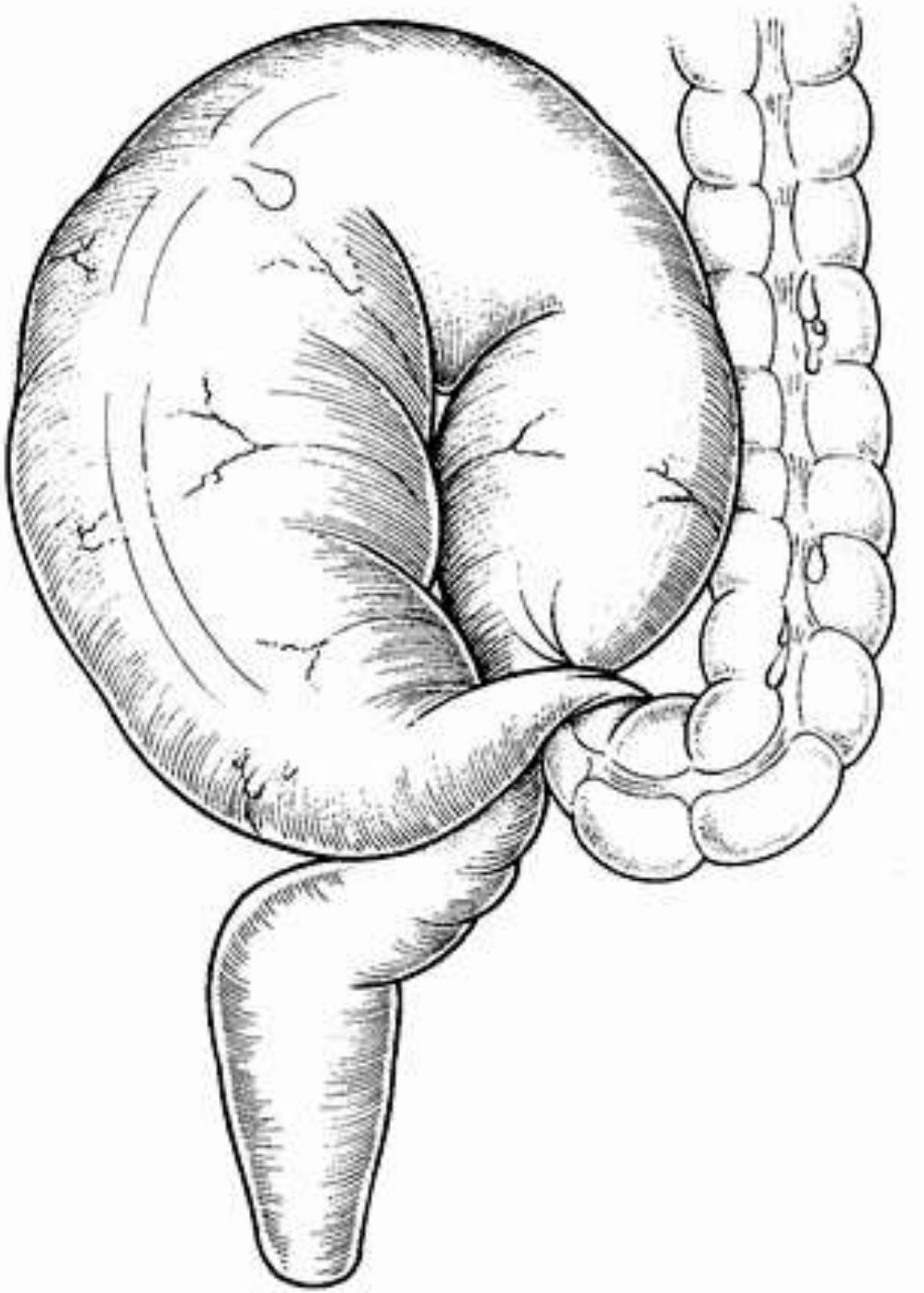
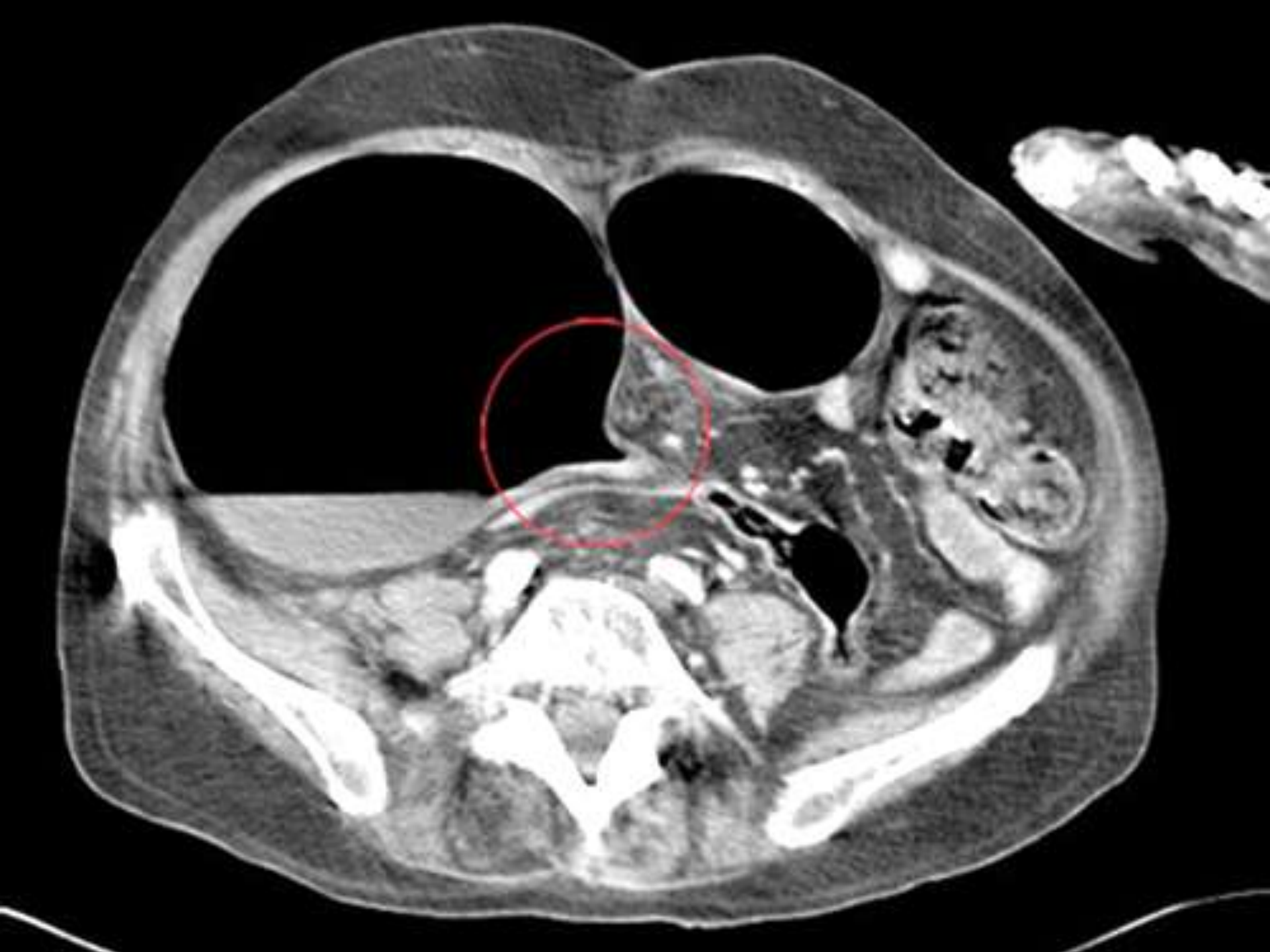
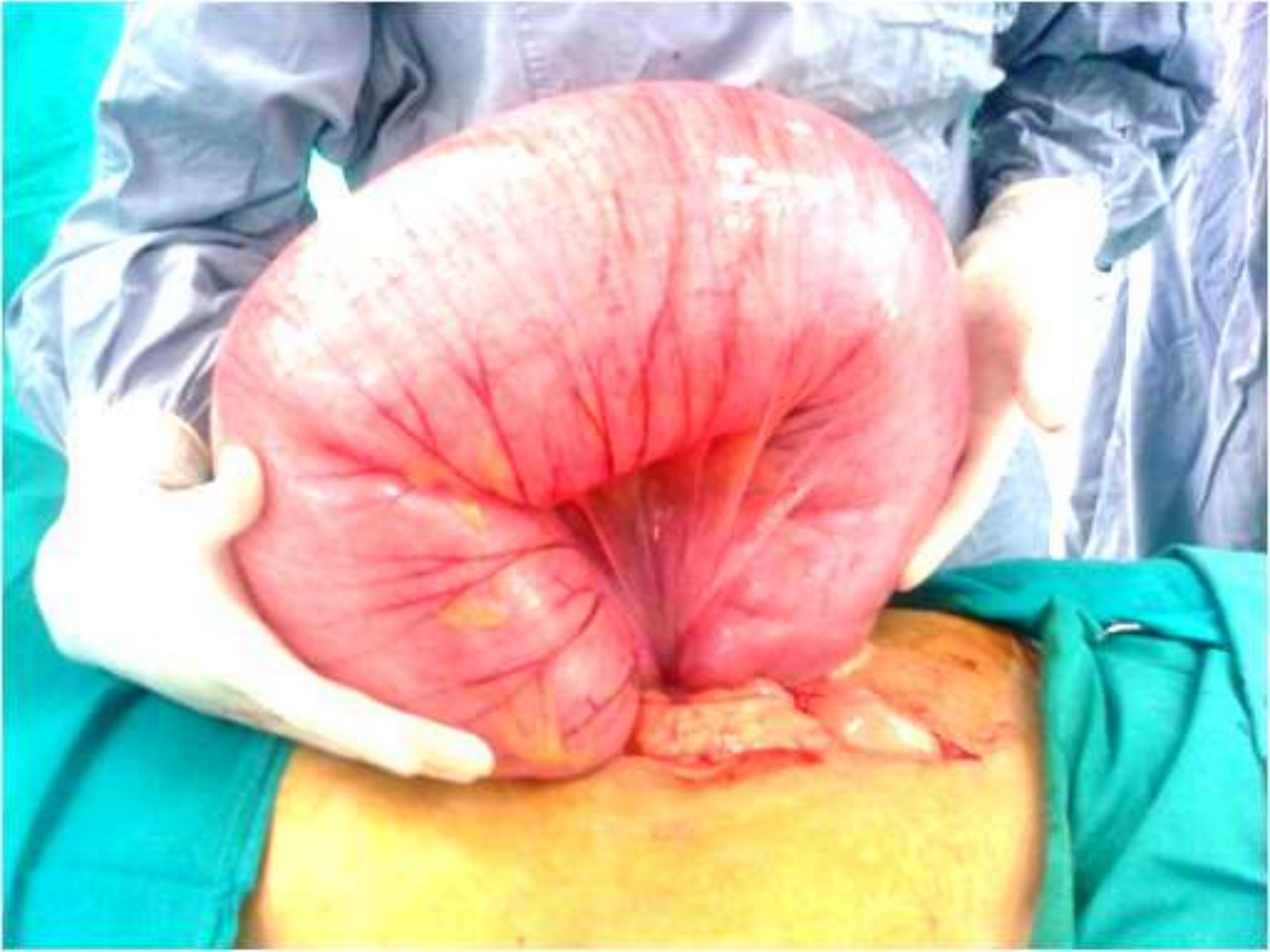


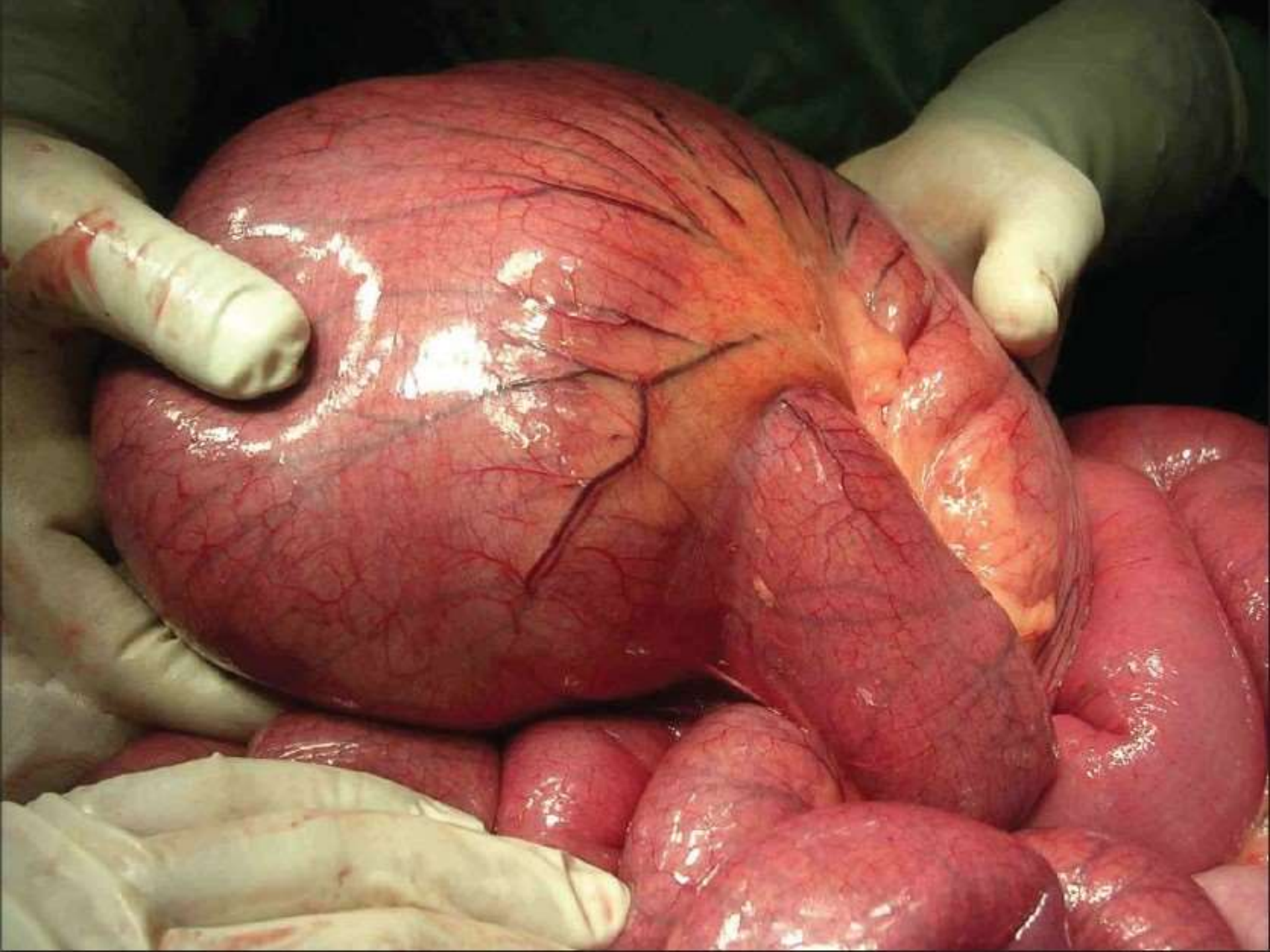


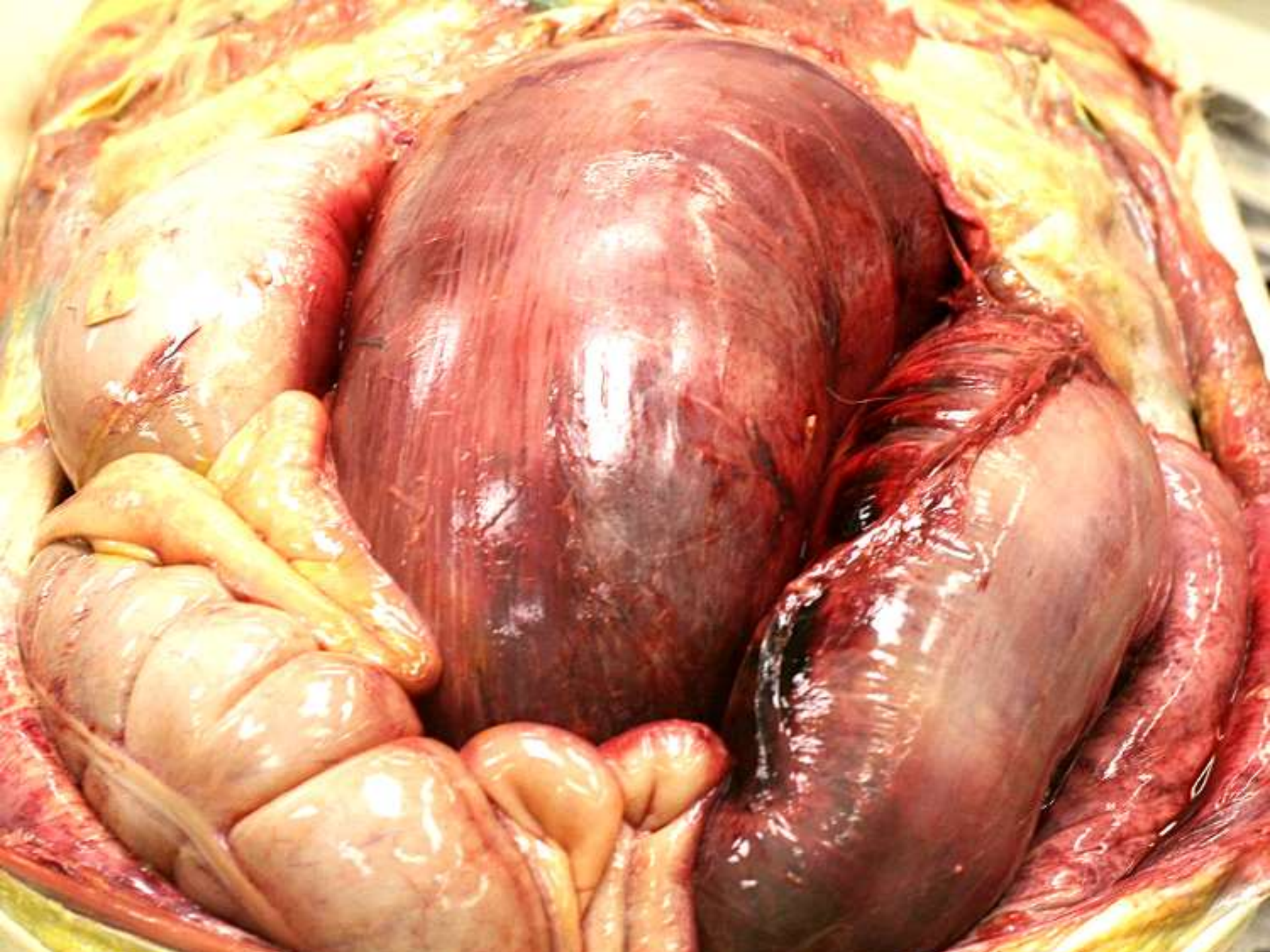
Sigmoid volvulus







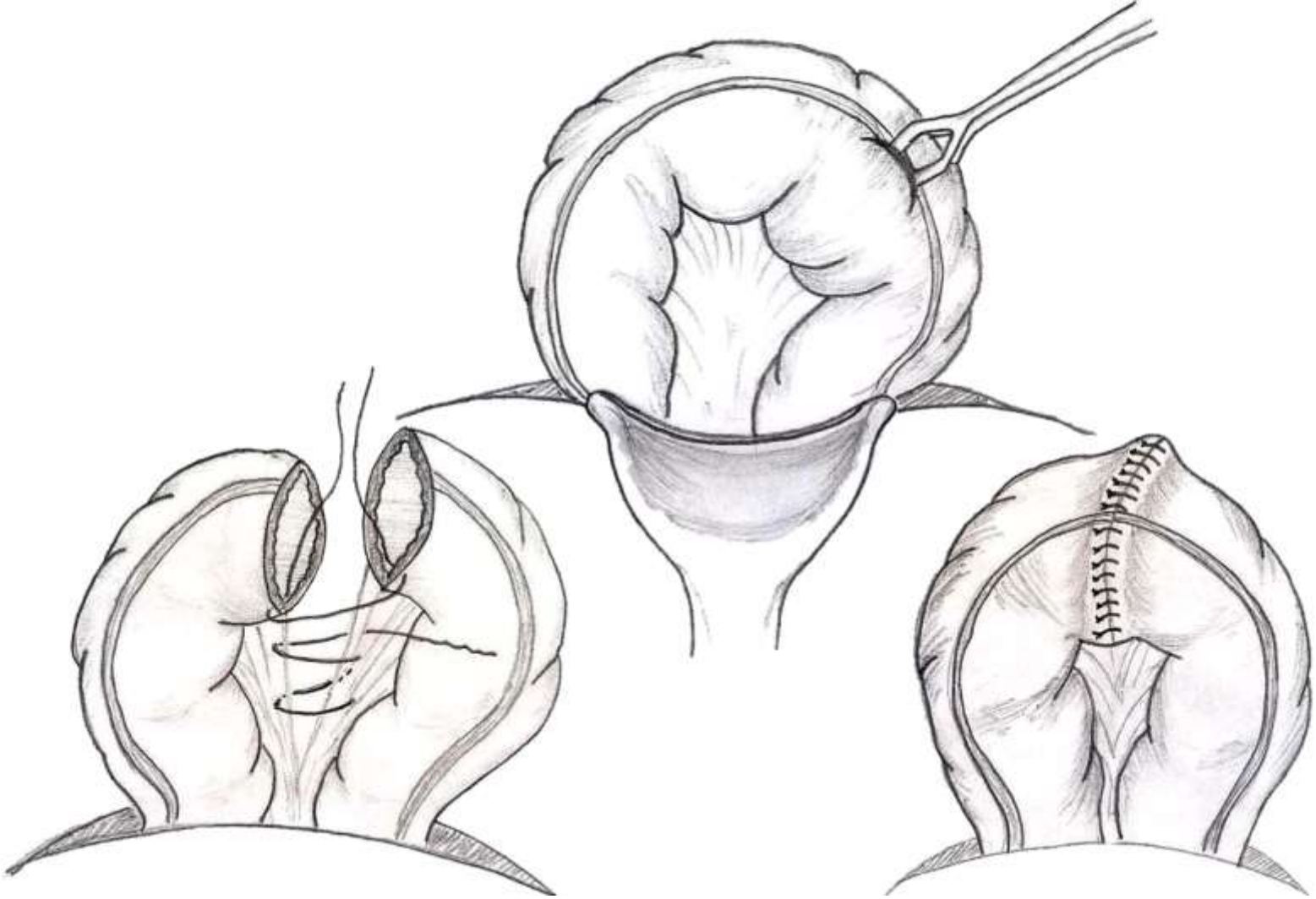


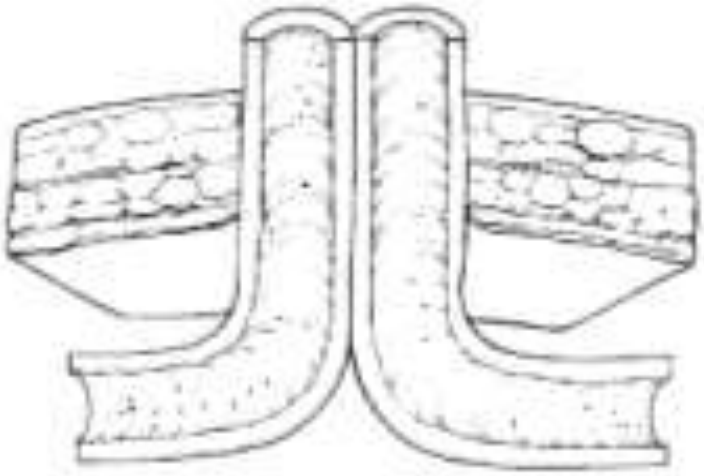


CRITICAL CLINICAL FEATURES OF THE BOWEL MANAGEMENT SYSTEM

Zassi

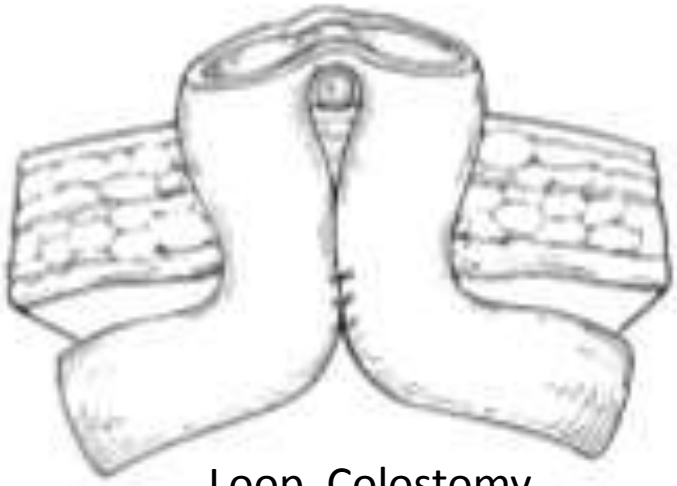
Bowel Management System





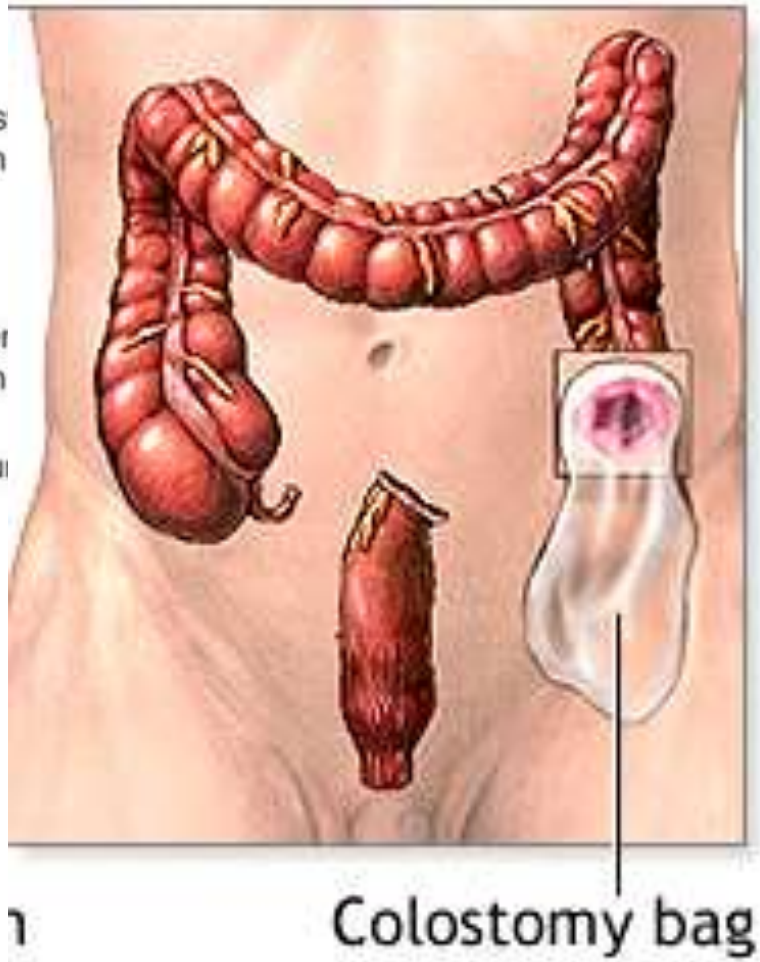
Double Barrel Colostomy

B



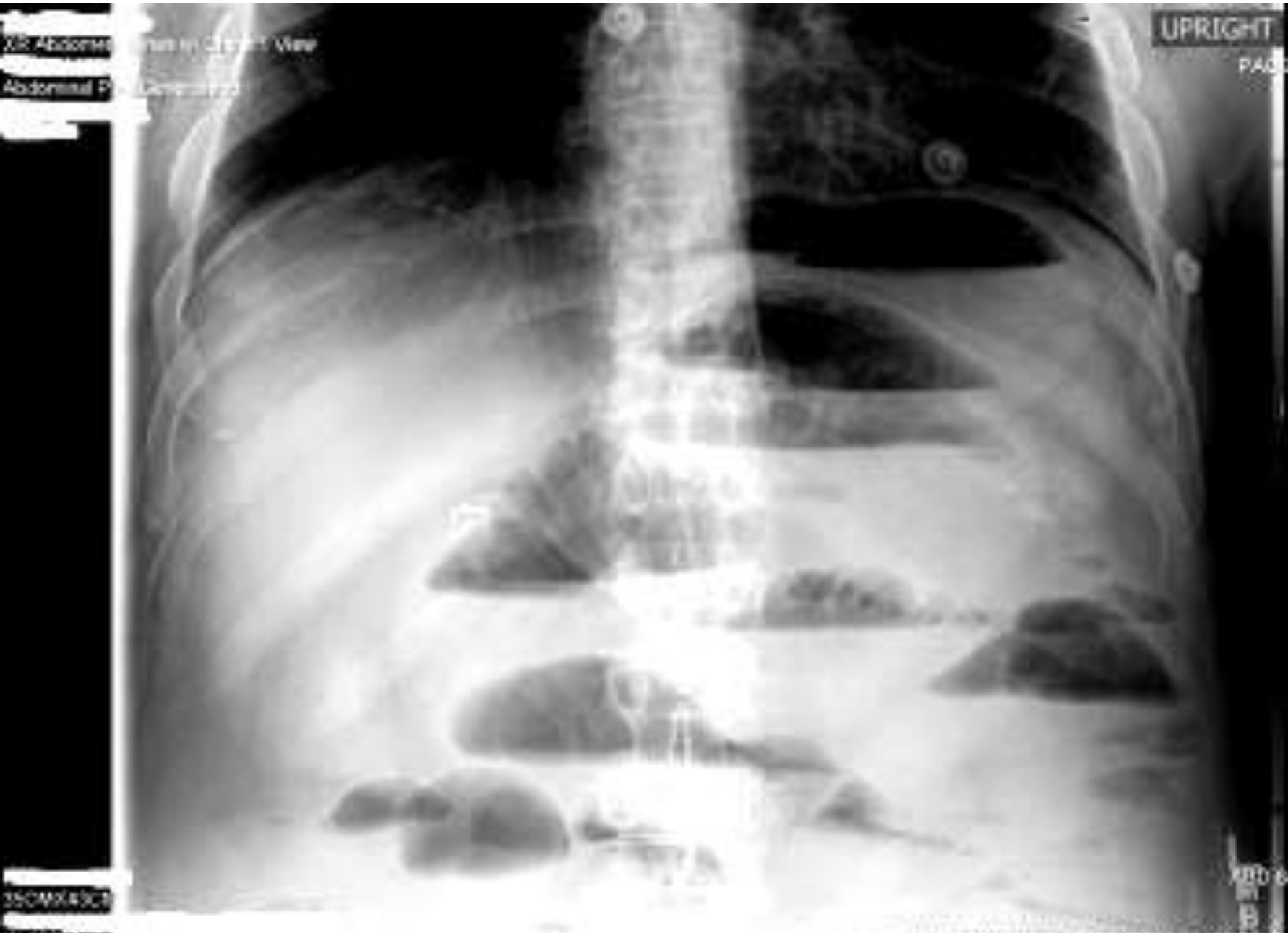
Loop Colostomy

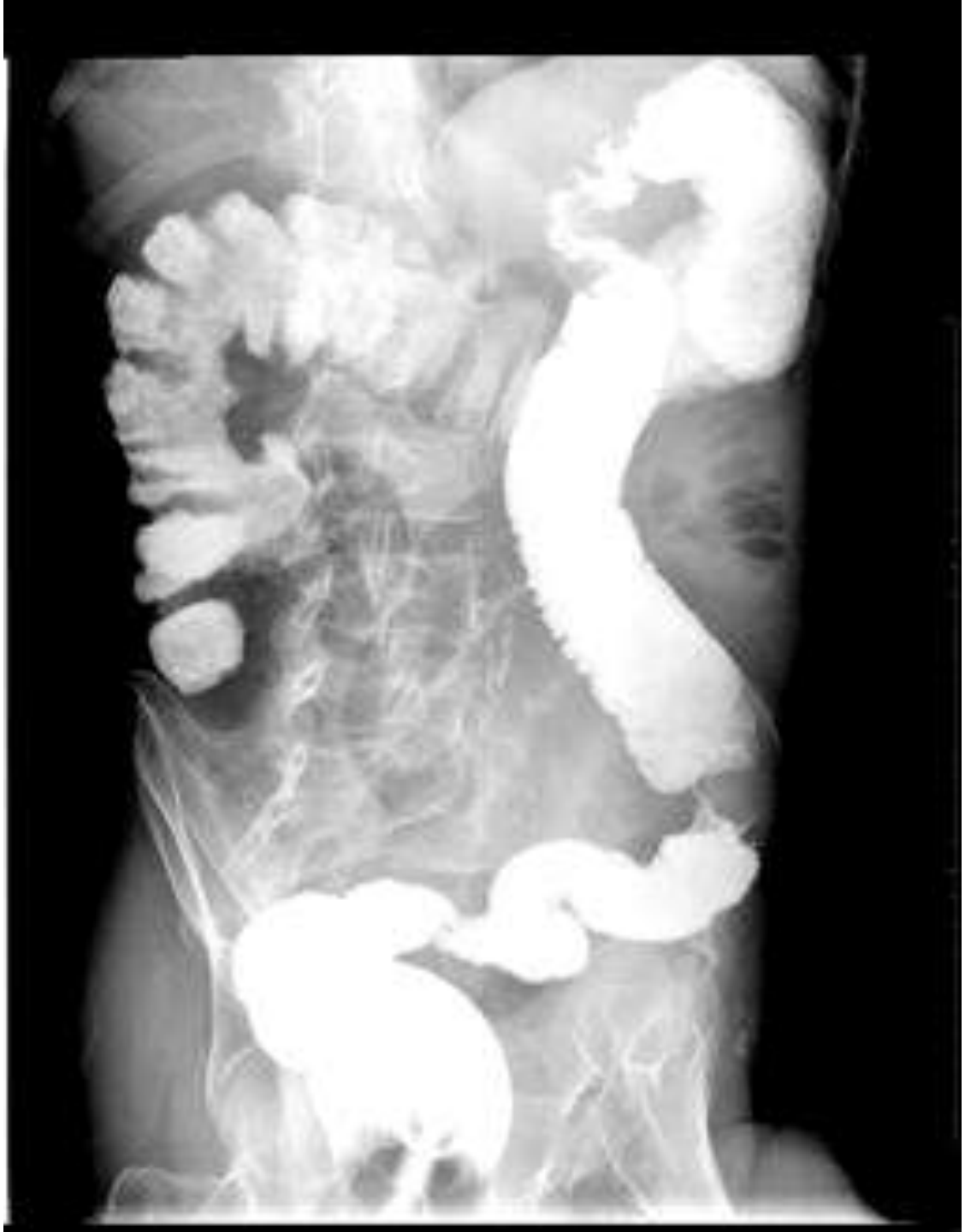
Hartmann's Procedure

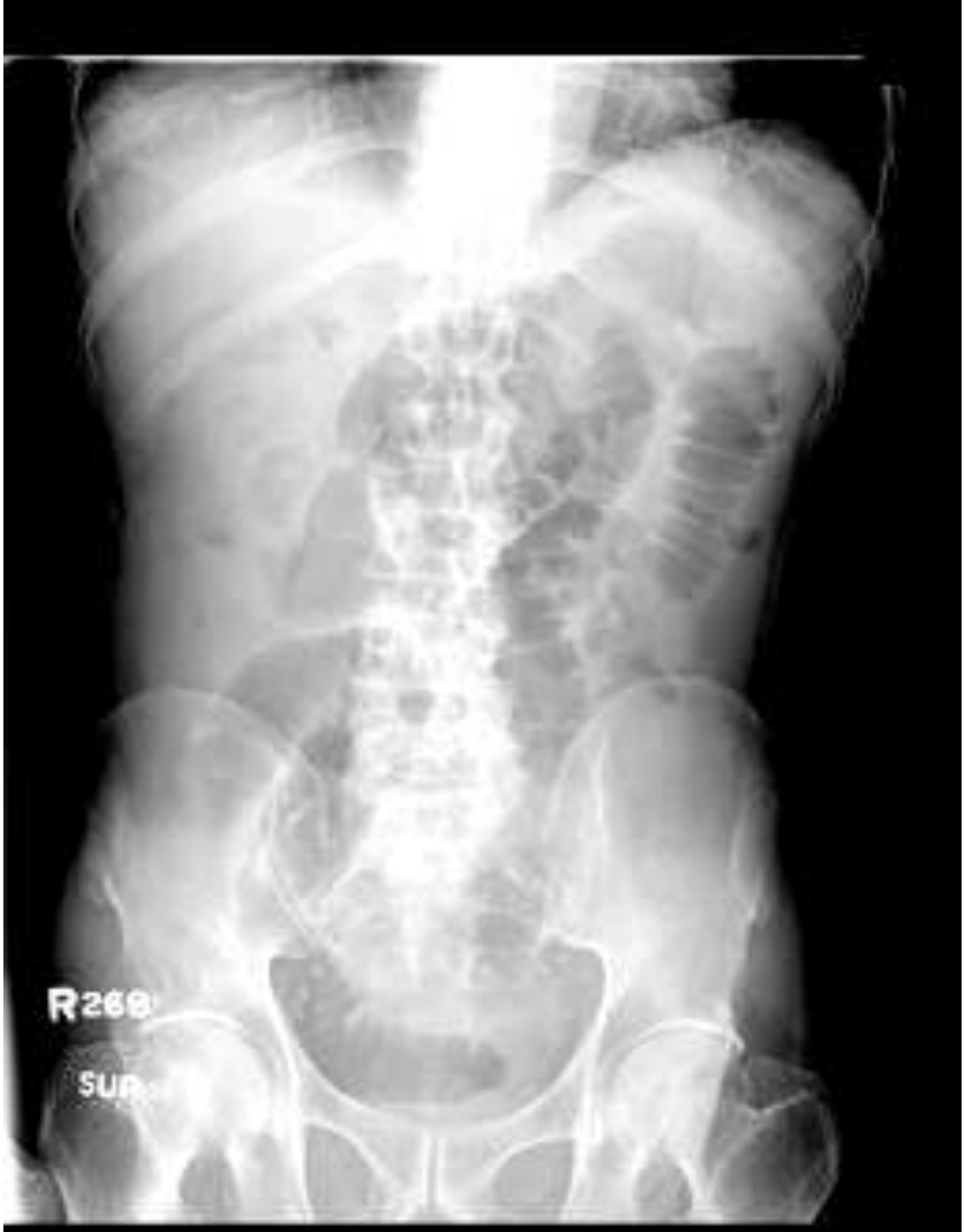


Radiological features of obstruction (on plain x-ray)

- The obstructed small bowel is characterised by straight segments that are generally central and lie transversely. No/minimal gas is seen in the colon
- The jejunum is characterised by its valvulae conniventes, which completely pass across the width of the bowel and are regularly spaced, giving a 'concertina' or ladder effect
- Ileum – the distal ileum has been piquantly described by Wangensteen as featureless
- Caecum – a distended caecum is shown by a rounded gas shadow in the right iliac fossa
- Large bowel, except for the caecum, shows haustral folds, which, unlike valvulae conniventes, are spaced irregularly, do not cross the whole diameter of the bowel and do not have indentations placed opposite one another


UPRIGHT




R268

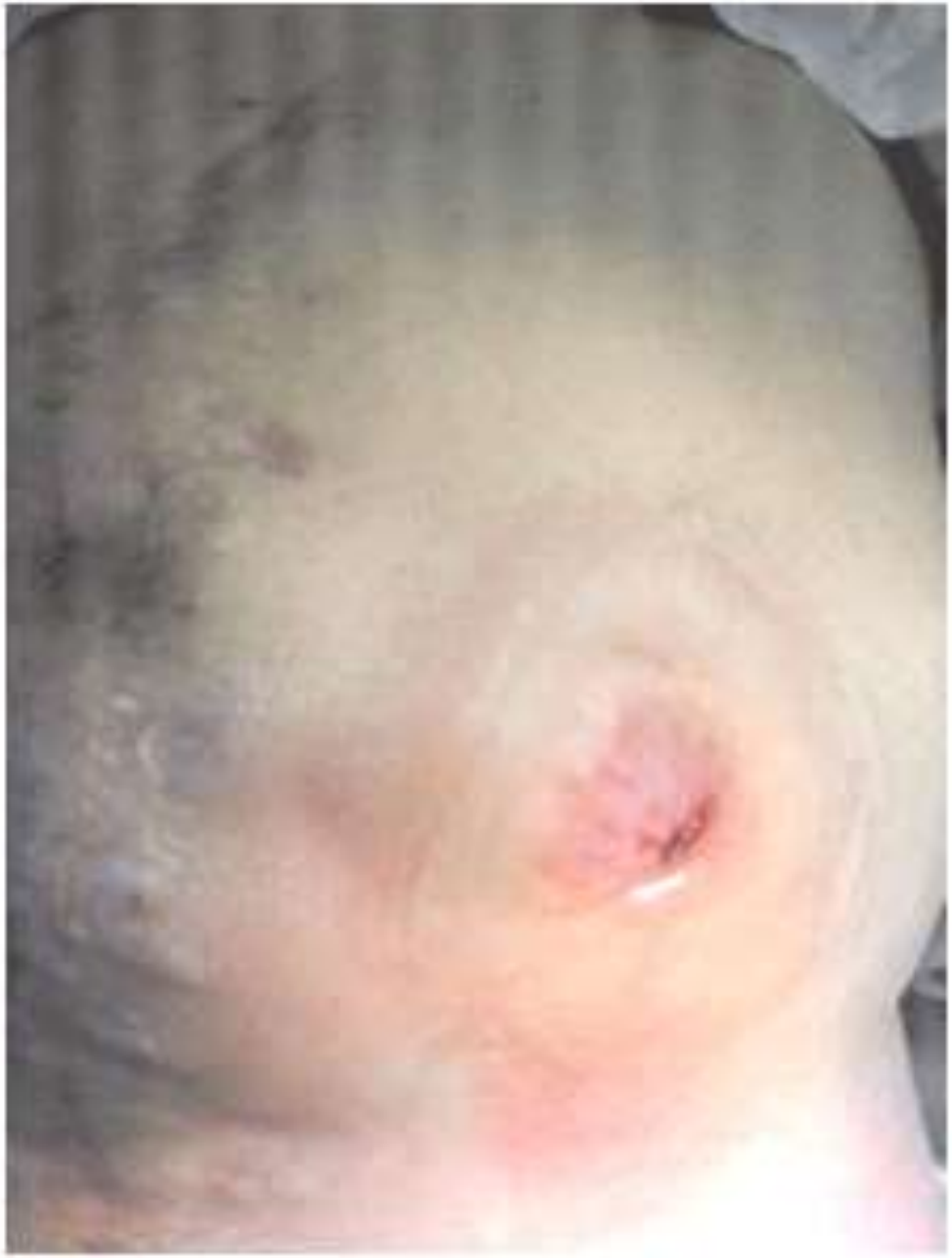


Figure 70.24 Stomal stenosis causing large bowel obstruction.

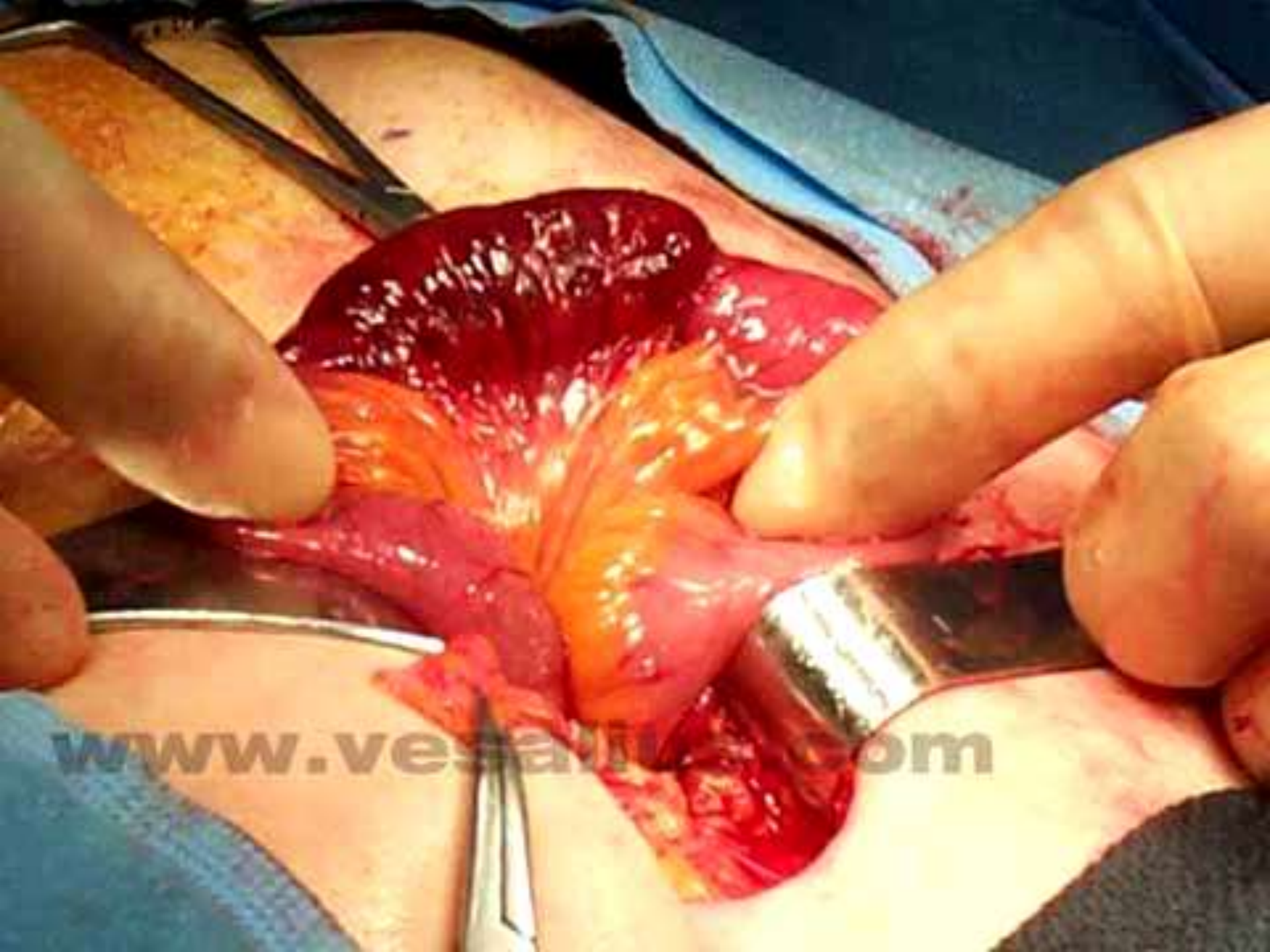
Functional Intestinal Obstruction

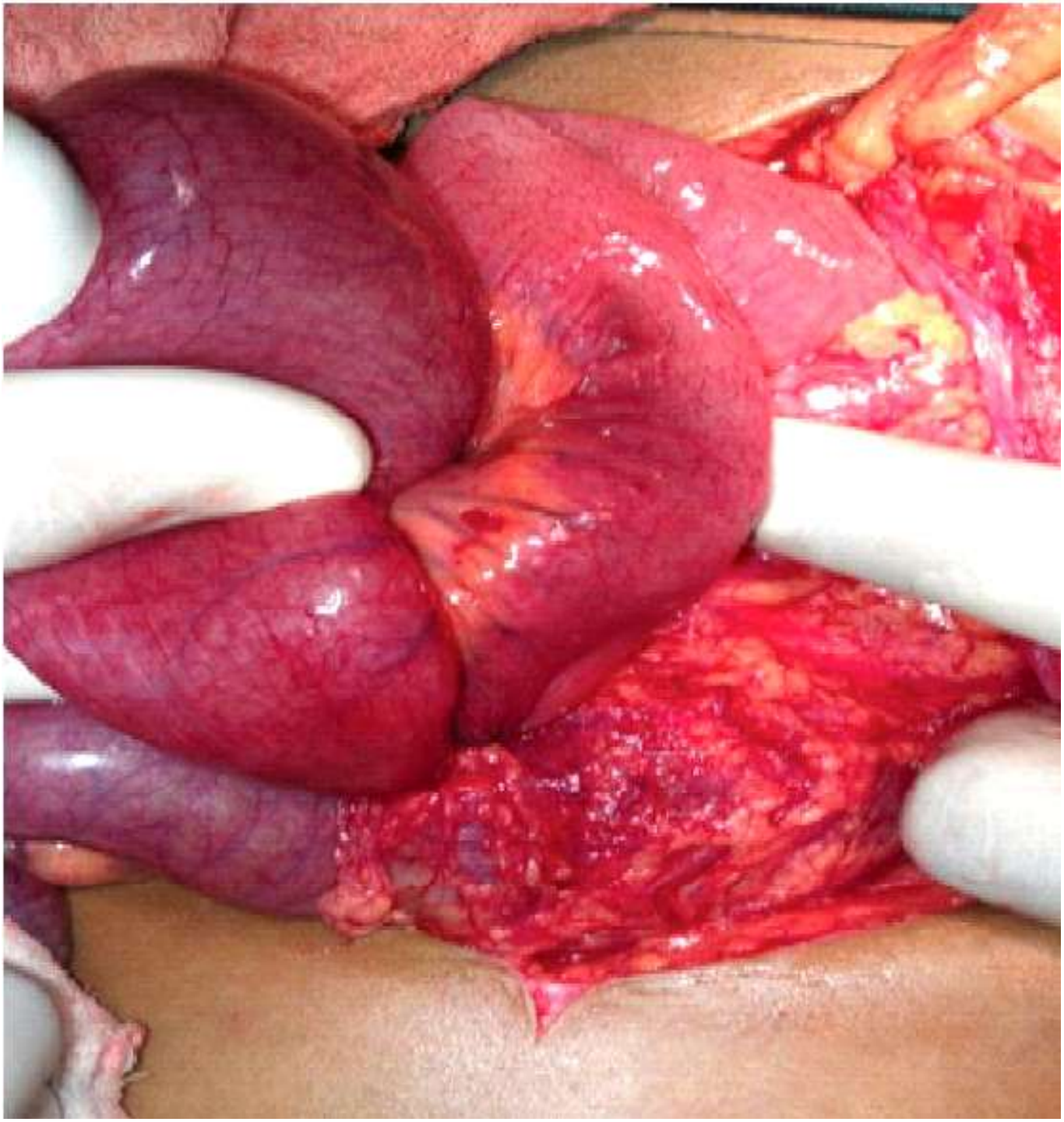
Causes of strangulation

- Direct pressure on the bowel wall
  - Hernial orifices
  - Adhesions/bands
- Interrupted mesenteric blood flow
  - Volvulus
  - Intussusception
- Increased intraluminal pressure
  - Closed-loop obstruction

Differentiation between viable and non-viable intestine.

	Viable	Non-viable
Circulation	Dark colour becomes lighter	Dark colour remains
	Visible pulsation in mesenteric arteries	No detectable pulsation
General appearance	Shiny	Dull and lustreless
Intestinal musculature	Firm	Flabby, thin and friable
	Peristalsis may be observed	No peristalsis





LARGE BOWEL OBSTRUCTION

Acute

–Carcinoma.

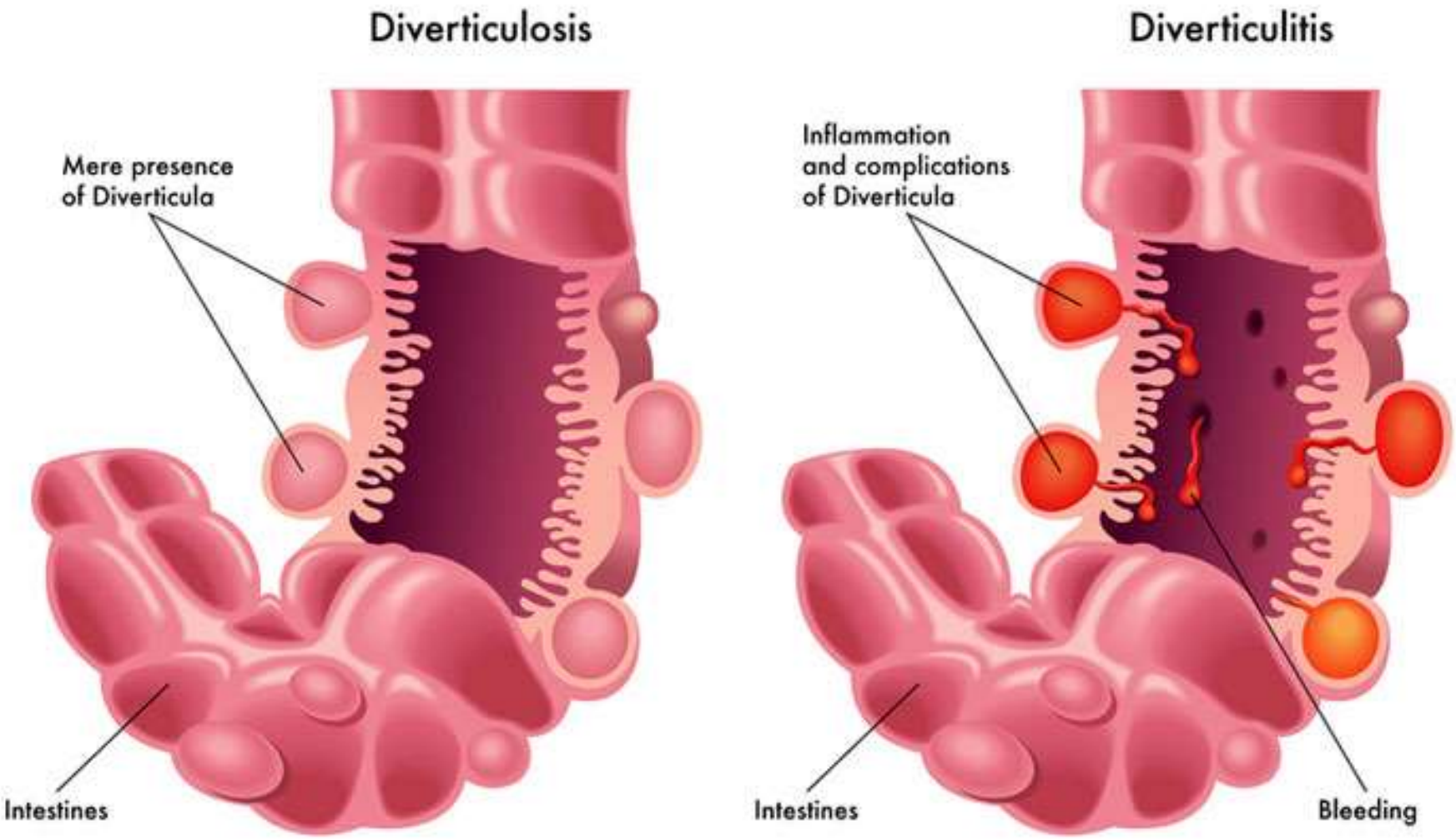
– Diverticular disease.

Chronic

- intraluminal (rare) – faecal impaction;
- intrinsic intramural – strictures (Crohn's disease, ischaemia, diverticular), anastomotic stenosis;
- extrinsic intramural (rare) – metastatic deposits (ovarian), endometriosis, stomal stenosis;

or functional:

- Hirschsprung's disease, idiopathic megacolon, pseudo-obstruction.


Diverticulosis
Mere presence
of Diverticula
Intestines
Diverticulitis
Inflammation
and complications
of Diverticula
Intestines
Bleeding

Paralytic Ileus

The following varieties are recognised:

- **Postoperative.** A degree of ileus usually occurs after any abdominal procedure and is self-limiting, with a variable duration of 24–72 hours. Postoperative ileus may be prolonged in the presence of hypoproteinaemia or metabolic abnormality (see below).
- **Infection.** Intra-abdominal sepsis may give rise to localised or generalised ileus.
- **Reflex ileus.** This may occur following fractures of the spine or ribs, retroperitoneal haemorrhage or even the application of a plaster jacket.
- **Metabolic.** Uraemia and hypokalaemia are the most common contributory factors.

Factors associated with pseudo-obstruction

- Retroperitoneal irritation
  - Blood
  - Urine
  - Enzymes (pancreatitis)
  - Tumour
- Drugs
  - Tricyclic antidepressants
  - Phenothiazines
  - Laxatives
- Secondary gastrointestinal involvement
  - Scleroderma
  - Chagas' disease

OGILVIE'S SYNDROME

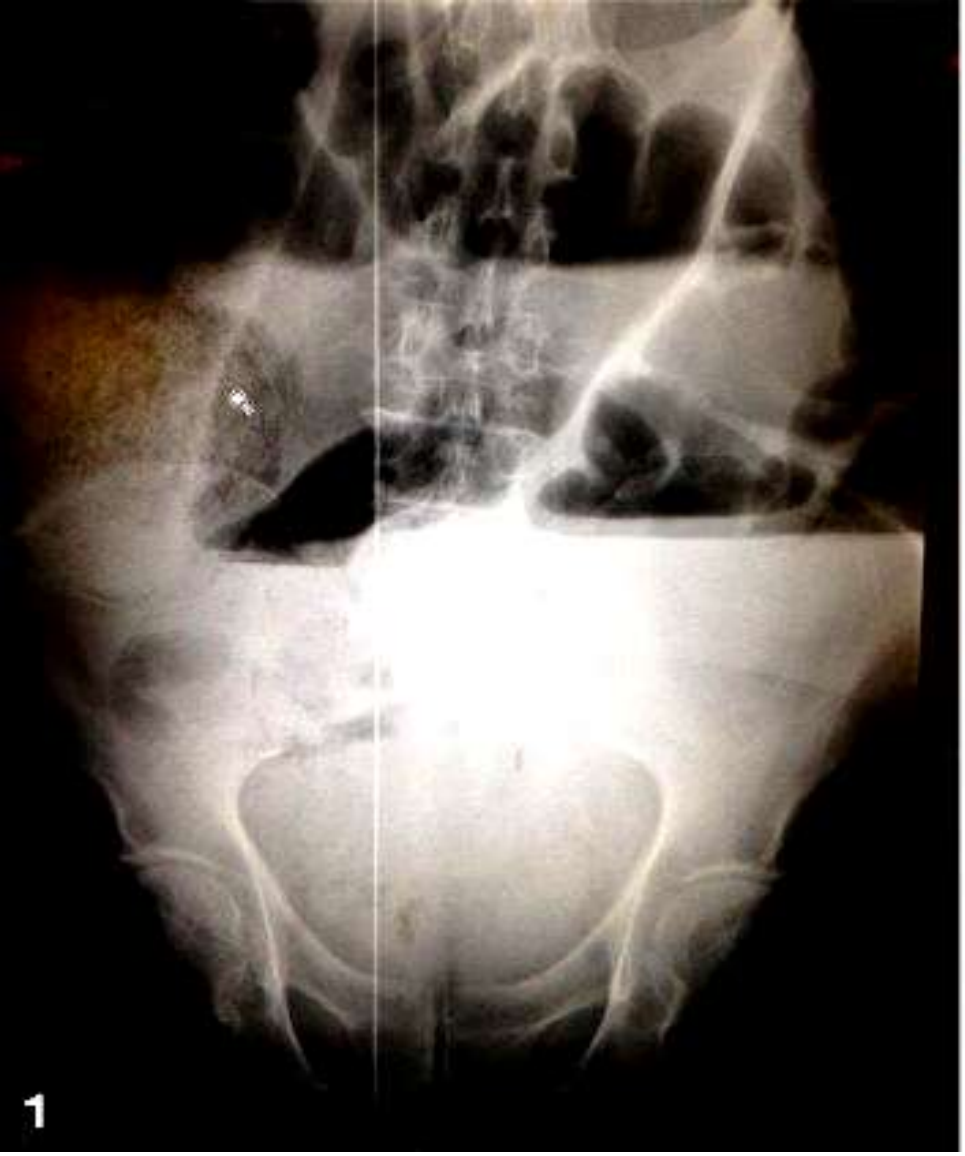
-Acute colonic pseudo-obstruction.

- The probable explanation is imbalance in the regulation of colonic motor activity by the autonomic nervous system

- Plain X ray, Single water soluble contrast study, CT scan, Colonoscopy.

- May be associated with caecal perforation, Peritonitis , Surgery.

- RX: cause, Neostigmine., colonoscopic decompression.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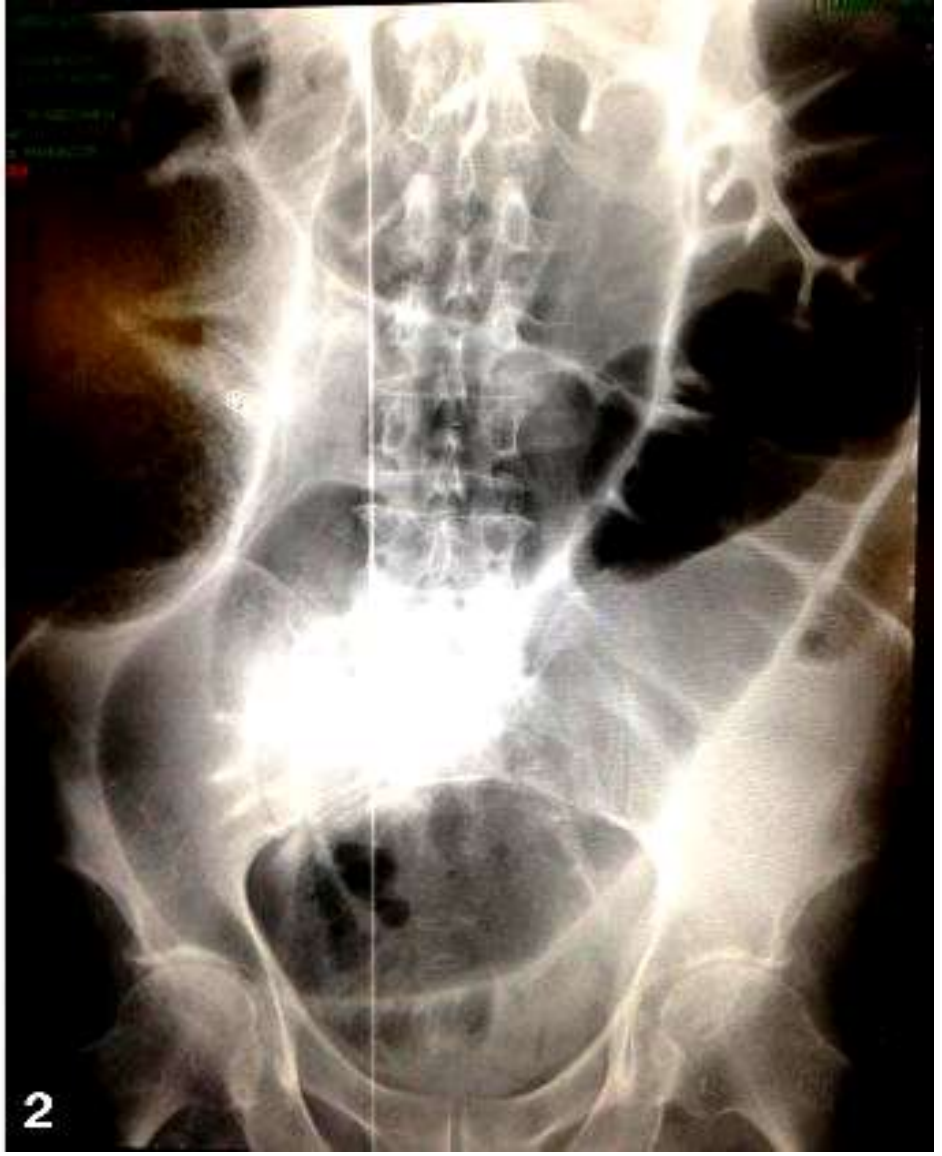
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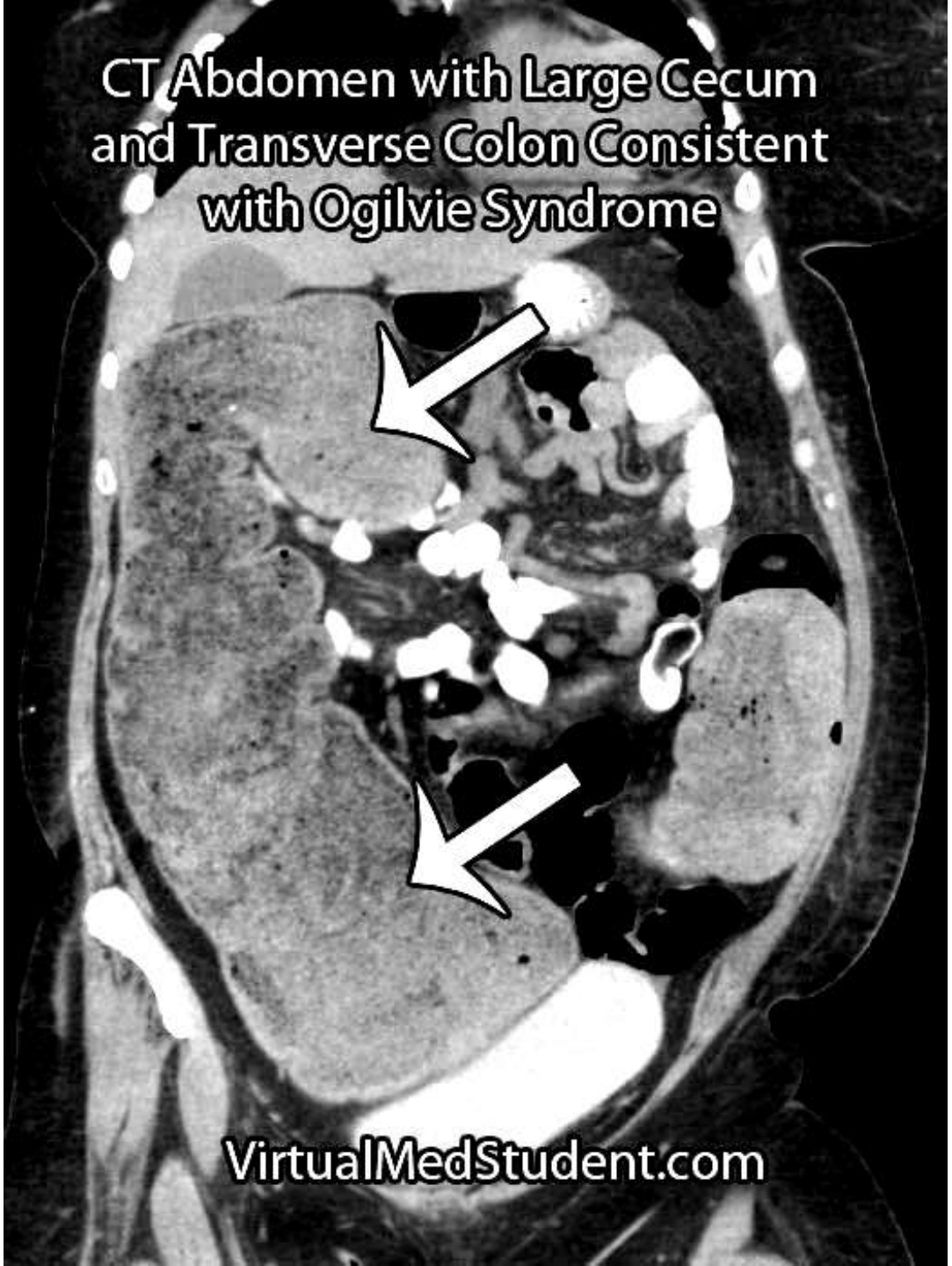
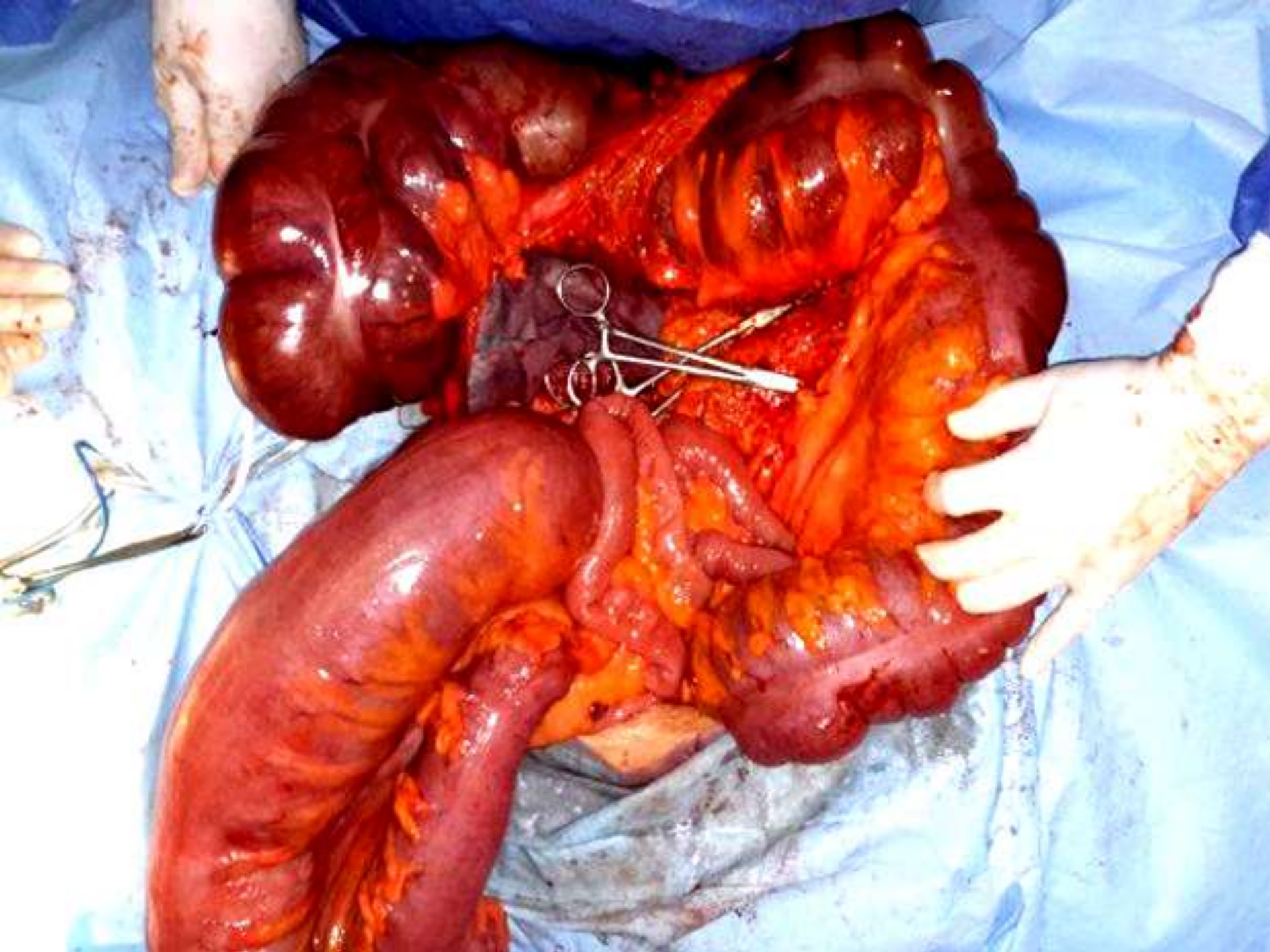
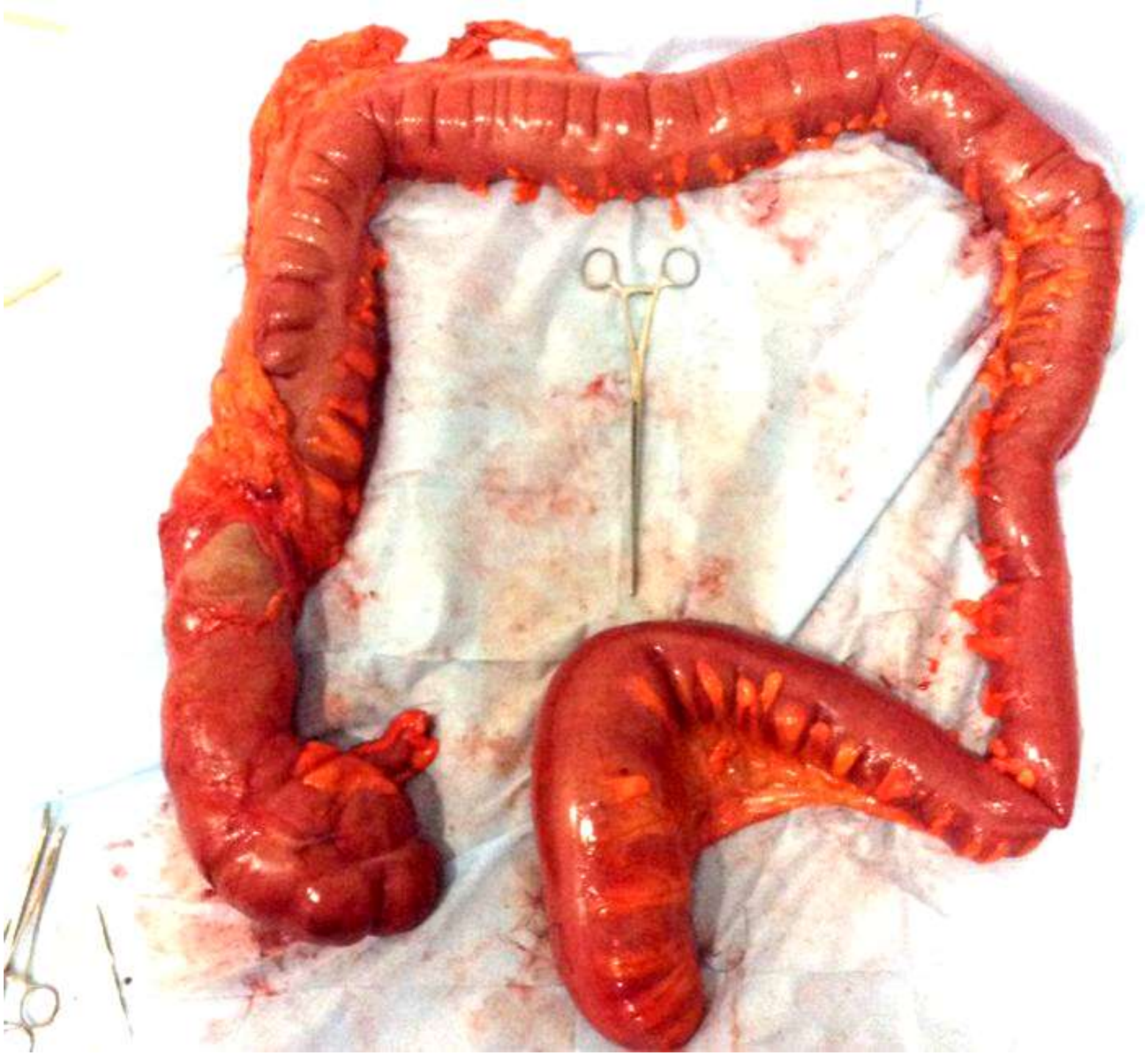

CT Abdomen with Large Cecum
and Transverse Colon Consistent
with Ogilvie Syndrome
VirtualMedStudent.com





THANKS FOR LISTENING