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Pathology of Intestine, DRE & Proctoscopy

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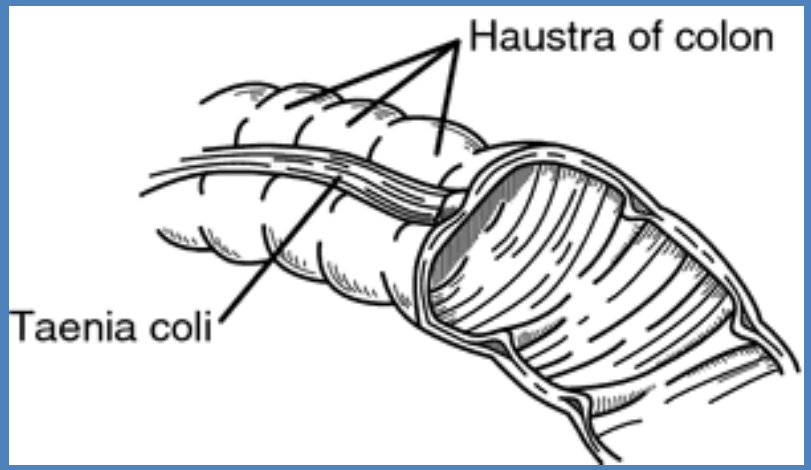
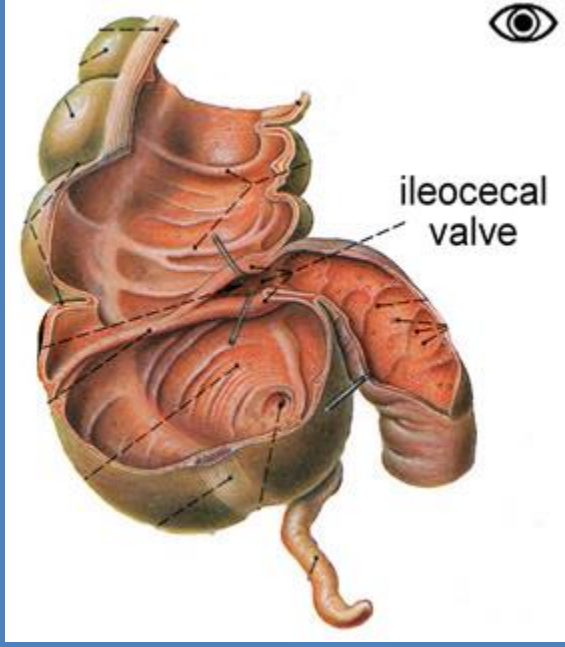
Valvulae conniventes-

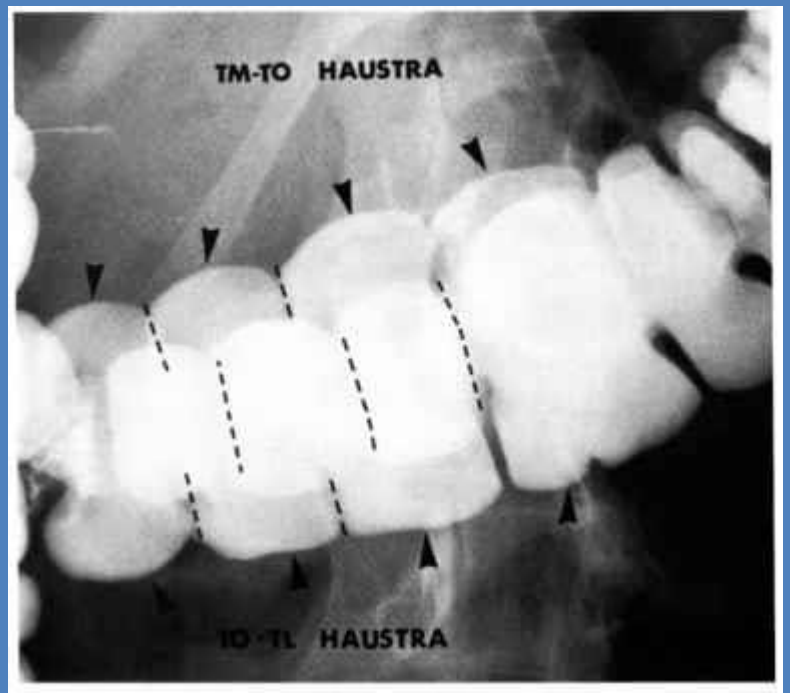
- Kerkcring folds/plicae circulares.
- Circular mucosal folds.
- Complete.
- Closely set.
- Uniform distance.

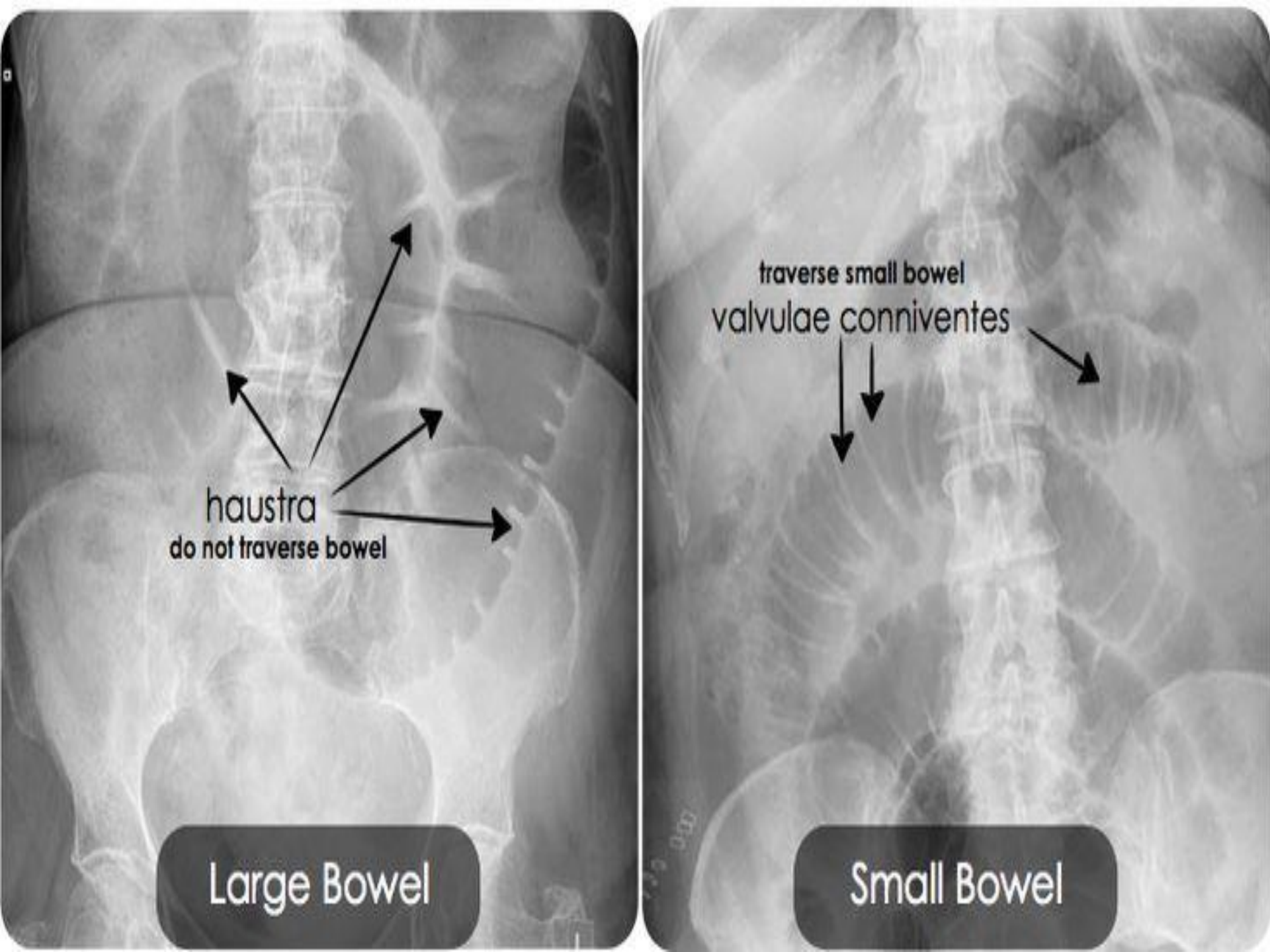




Haustra--

- Circular mucosal folds.
- Incomplete.
- Sparsely set.
- Not Uniform distance.




haustra
do not traverse bowel
Large Bowel
traverse small bowel
valvulae conniventes
Small Bowel

After birth-

- Atresia or agenesis (ARM, duodenum, ileum).
- Meconium ileus.
- Volvulous neonatorum.
- Hirschprung disease.

- 3 weeks-
  - CHPS.
  - Hirschprung’s disease.

- 6-9 months-
  - Intususception.
  - Hirschprung’s disease.
  - Ascariasis.

- Adult-
  - Postoperative.
  - Obstructed hernia.
  - Intestinal TB.
  - Crohn’s disease.

- Elderly-
  - Volvulus.
  - Malignancy
  - Diverticulitis
  - CD.
  - Faecaloma.

Cardinal features

- Abdominal distension.
- Pain.
- Vomiting.
- Constipation.

Small intestinal obstruction	Large intestinal obstruction
Usually acute.	Usually chronic.
Upper or central abdominal distension.	Lower or peripheral.
Visible peristalsis- upper or central abdomen.	Peripheral.
Early profuse vomiting.	Usually constipation & distension.
Severe fluid & electrolyte imbalance.	Usually no.
Metabolic alkalosis.	Metabolic acidosis(not always).

Causes of abdominal distension

The 6 F's-

- Flatus.
- Faeces.
- Fluid.
- Fat.
- Foetus.
- Fatal tumor.

Normal gas pattern

- Fundic gas.
- 1st part of duodenum.
- Terminal ileum.
- Rectum & sigmoid.
- Varying amount of gas in the rest of the large bowel.

Abdominal pain

Colicky pain due to-

Distension-

- Swallowed air.
- Intestinal gas.
- Secreted fluid.
- Obstruction.

Peristalsis against obstruction.

Rule of 3,6,9

The upper limit of normal diameter of the bowel is generally accepted as-

- 3cm for the small bowel,
- 6cm for the colon and
- 9cm for the caecum (3/6/9 rule).

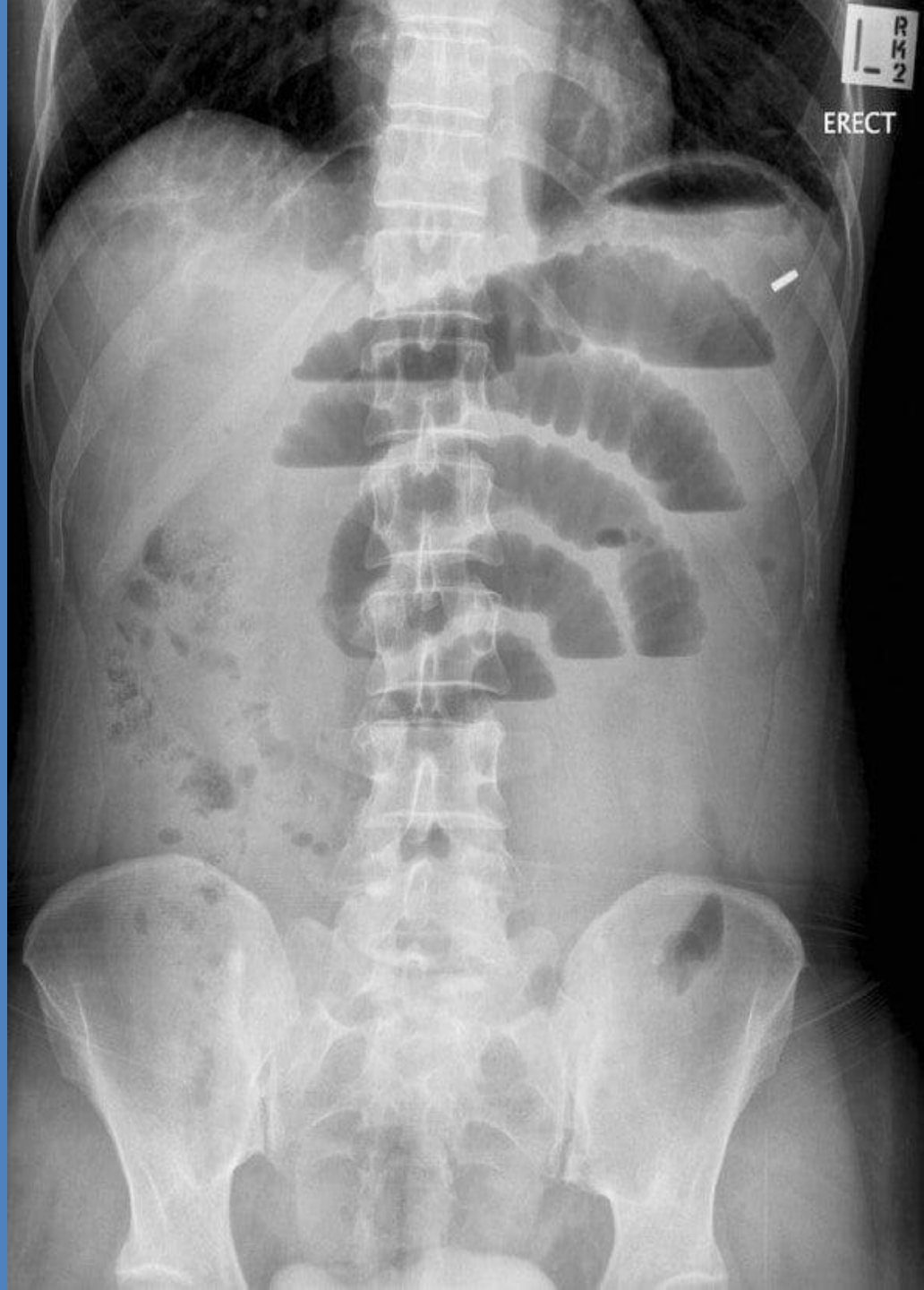
Radiological difference of small & large intestine

	Small intestine	Large intestine
Diameter	>3cm & <5cm.	>5cm & (caecum >9cm).
Position	Central	Peripheral.
Loops	Many	Few
Air fluid level	Many, short.	Few, long.
Bowel markings	Valvulae conniventes.	Haustra.

- Distended small bowel loops.
- Transverse lie.
- Multiple air-fluid level.
- Centrally placed.
- Step ladder pattern.

Normal air-fluid level-

- Fundic gas.
- 1st part duodenum.
- Terminal ileum.
- SI (children).



- Distended bowel loop.
- Presence of haustra.
- Wider diameter.
- Peripherally placed.
- Horizontal & vertical arrangement of loop.
- Air-fluid level-
  - Longer length
  - Small number.

- Large pneumatic tyre like shadow.
- Without haustra or septa.
- arising from pelvis.
- Inverted U or Coffee bean sign.
- 2 lumen, 3 walls (Dahl Froment sign).

--Sigmoid volvulus.

- 2 twisted loop.
- Central double walled component.

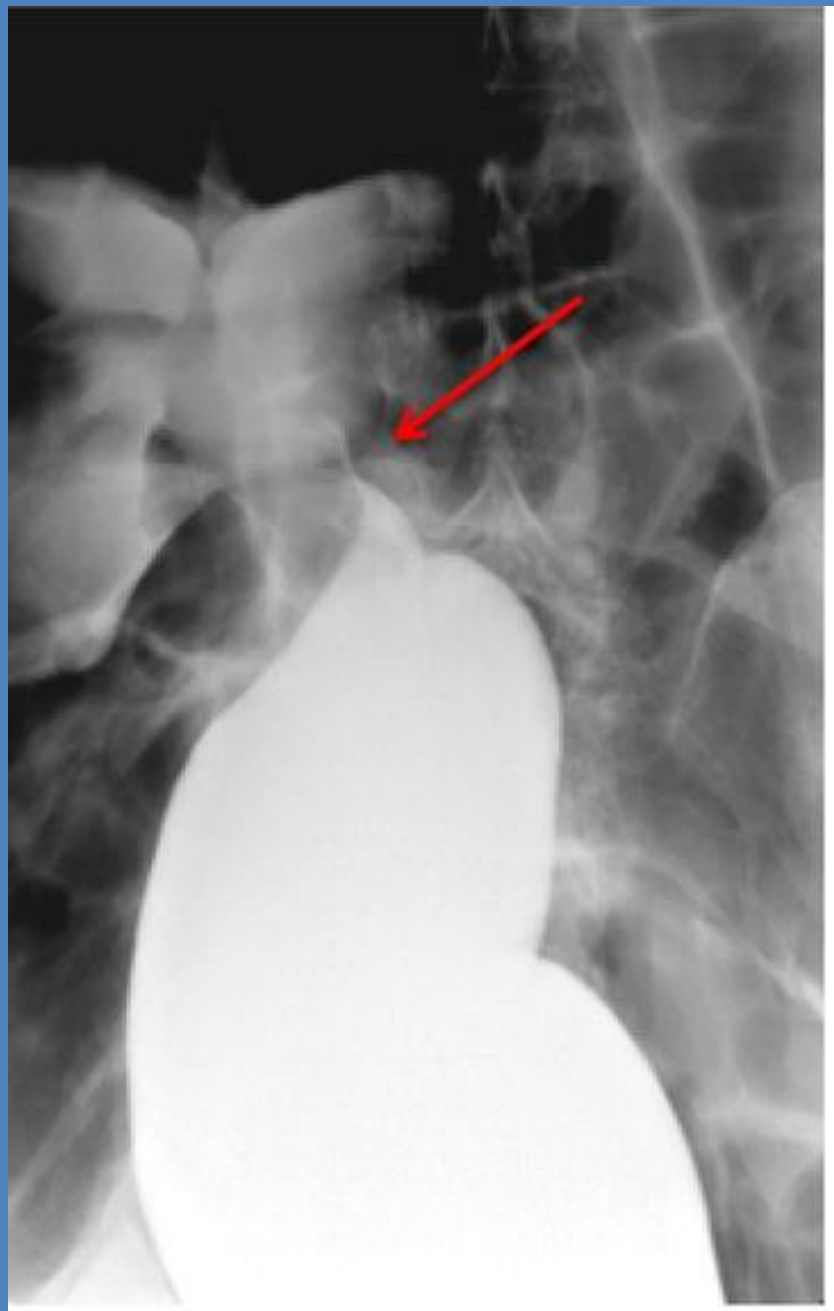
Coffee Bean Sign

Sigmoid volvulus

Massively dilated sigmoid loop

Barium enema X-ray-

- Bird beak appearance



A

B

Predisposing factors-

- Long sigmoid mesocolon.
- Narrow attatchment.
- Long, redundant, & pendulous sigmoid.
- Loaded colon.

Assessment of gut viability-

- Clinically-
  - Pink serosa.
  - Peristalsis.
  - Positive pulsation.
  - Bleeding on pin prick.
  - Color change on hot compression.

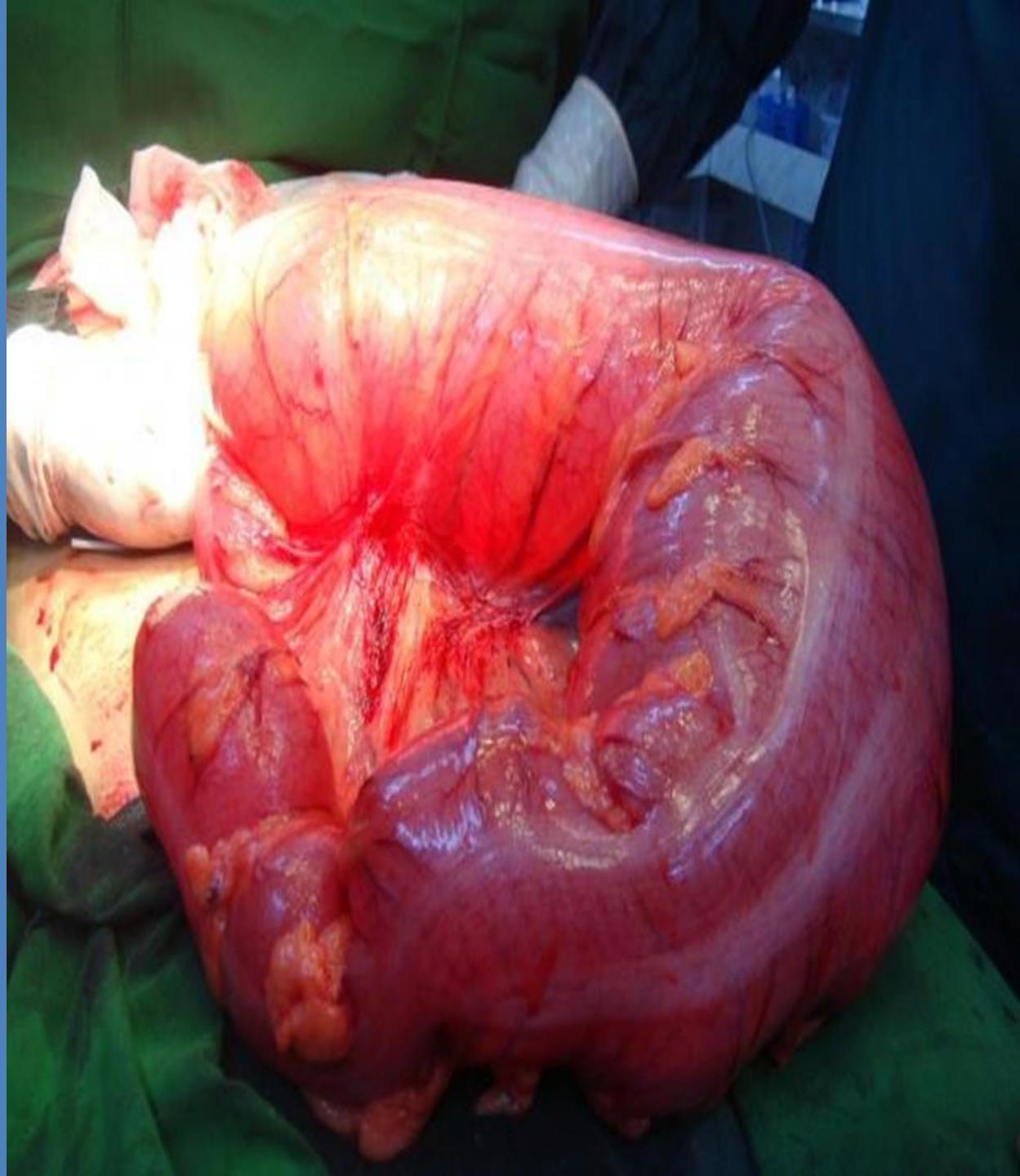
- Doppler USG- detects antimesenteric blood flow.
- Fluorescein dye test- IV 1 gm Na fluroscein.

Per operative findings-

- Gut is hugely distended & twisted.
- Blackish discoloration.
- No peristalsis.
- No bleeding on pin prick.
- No colour change on hot mop compression.

Options-

- Sigmoidopexy.
- Primary Resection & anastomosis.
- Resection anastomosis With proximal ileostomy.
- Hartmann’s procedure.
- Paul Mikulicz operation.



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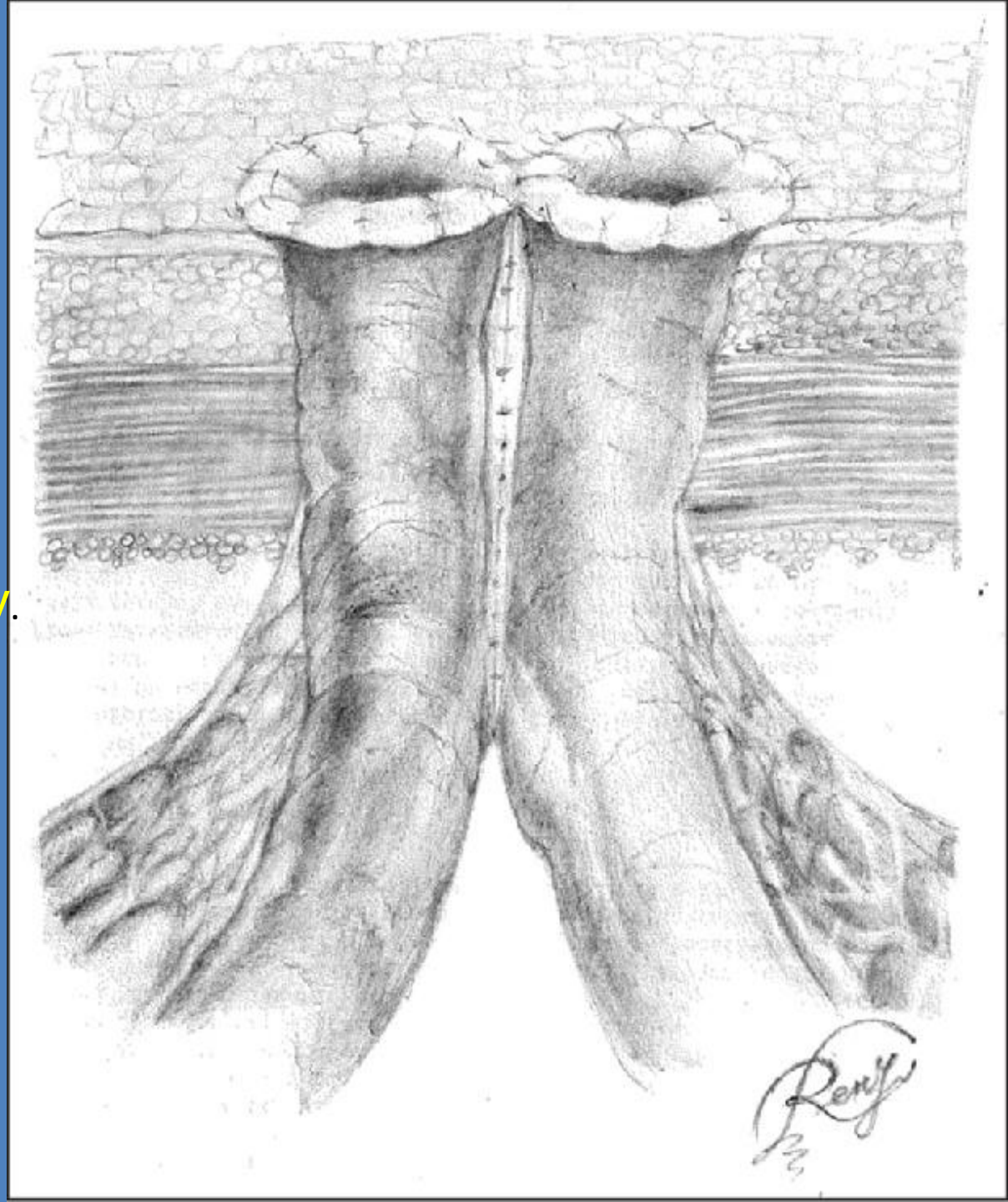
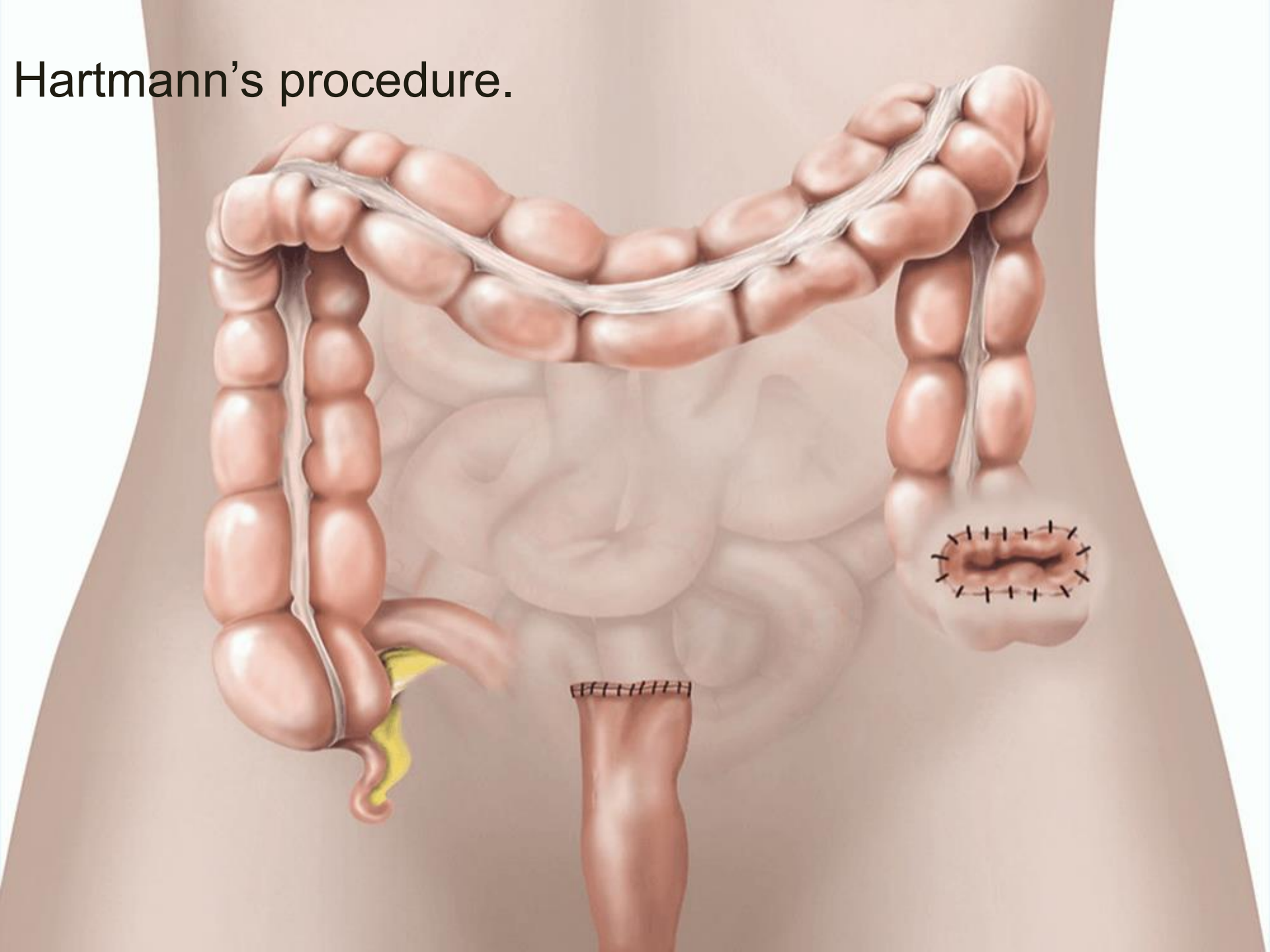
Paul mikilicz operation.

Double ended colostomy.

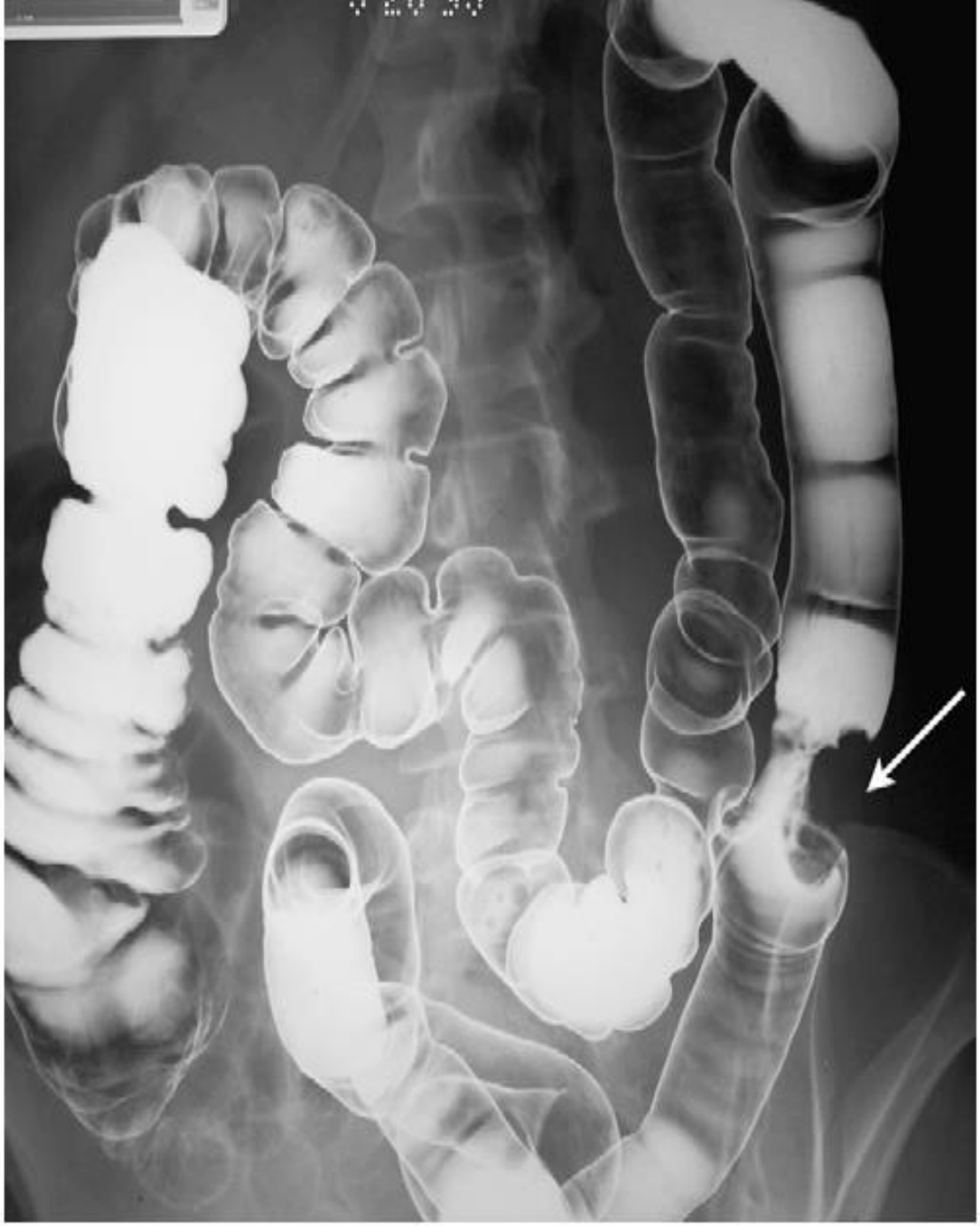


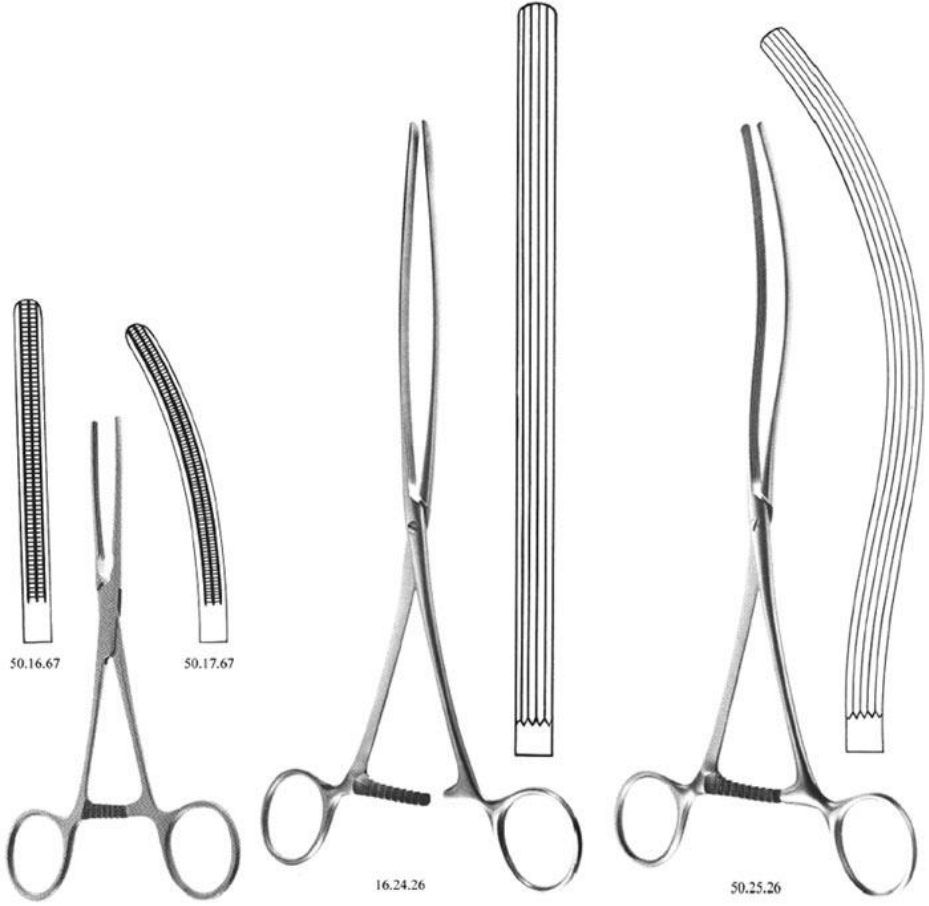
Hartmann’s procedure.

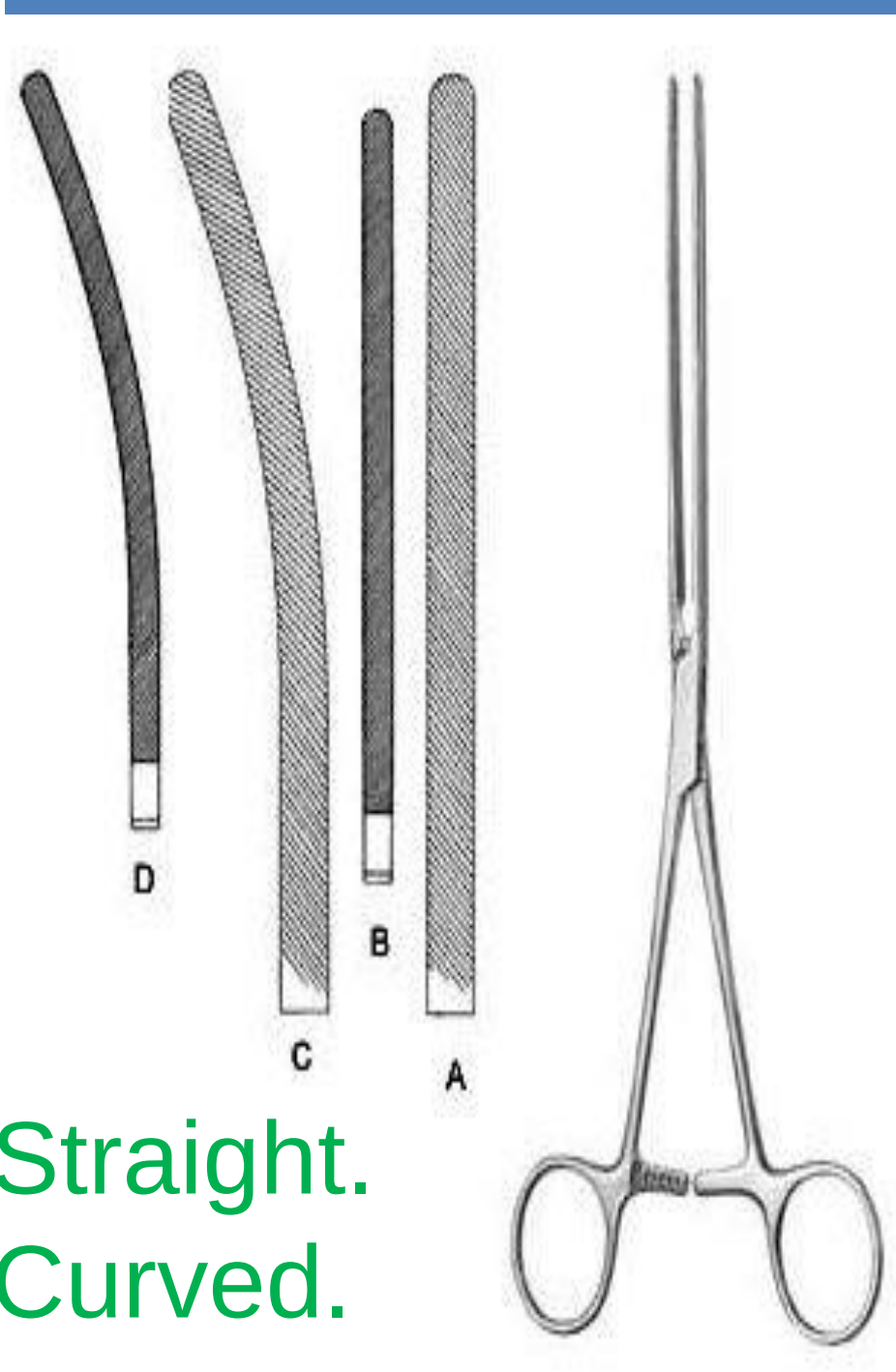


DCBE-

- Persistent irregular filling defect.
- Gross narrowing.
- Apple core appearance.
- Shouldering effect.







Occlussive variety.
Crushing variety.

Straight.
Curved.

Functions-

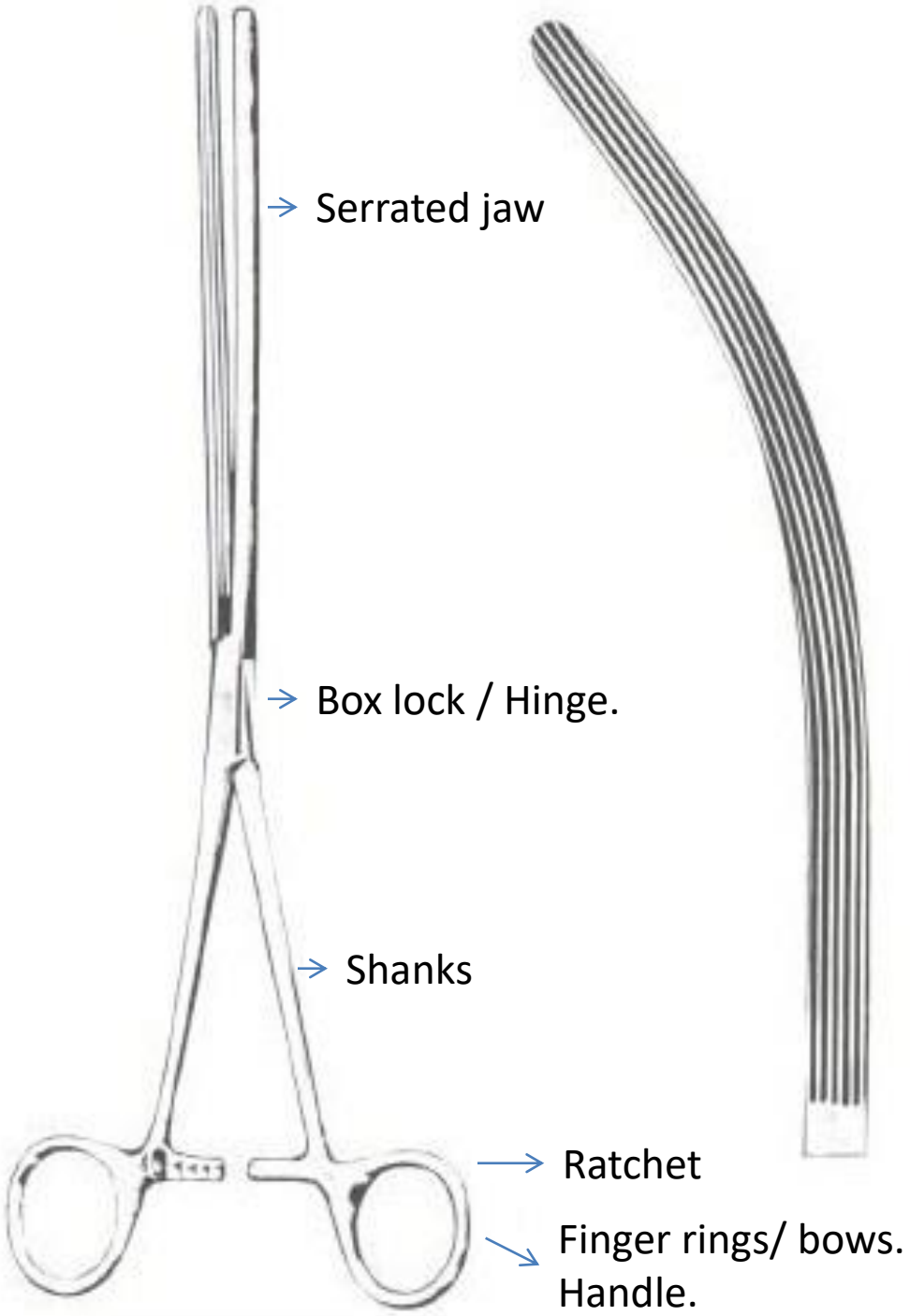
- Occlussion.
- Haemostasis.
- Apposition.

Sterilization-

- Autoclaving.

Resected end- Crushing variety.

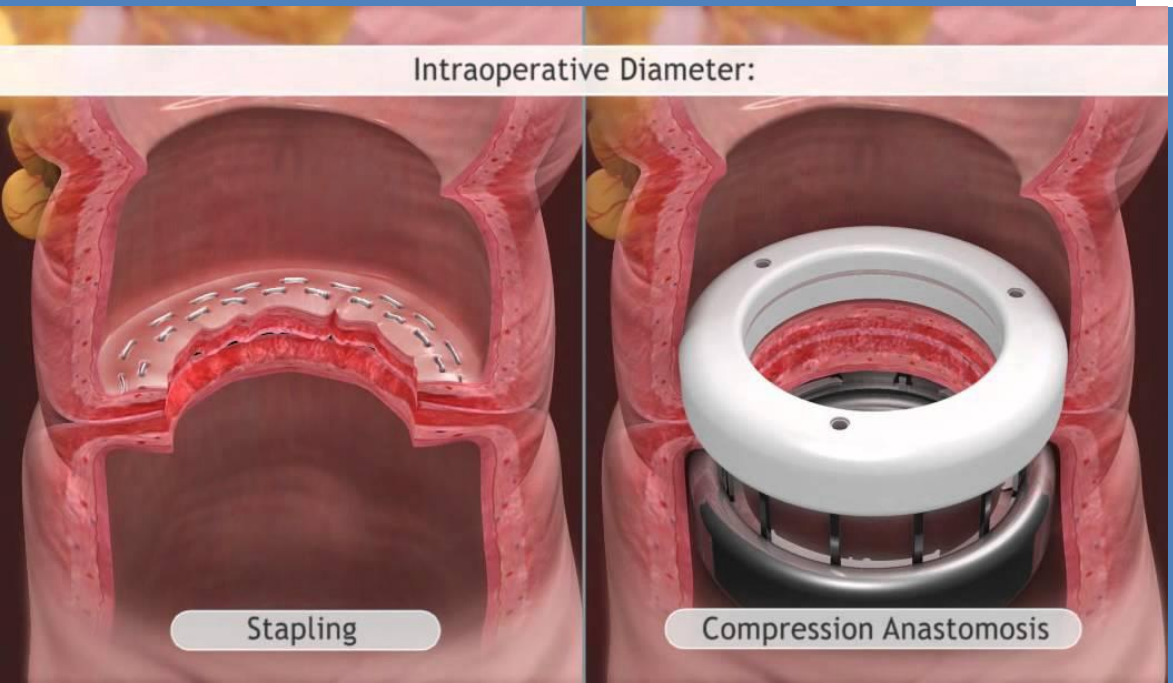
Remaining segment- Occlussive.



Principles of anastomosis

- Good blood supply.
- Tension free anastomosis.
- Air tight & water tight.
- Anastomosis with healthy, non diseased bowel ends.

- 3-0 R/B vicryl.
- Single layer seromuscular extramucosal.
- Single layer full thickness.
- Small intestine, ileocolic & ileorectal anastomosis- safe.



- Oesophageal,
- Pancreaticoenteric
- Colorectal anastomosis

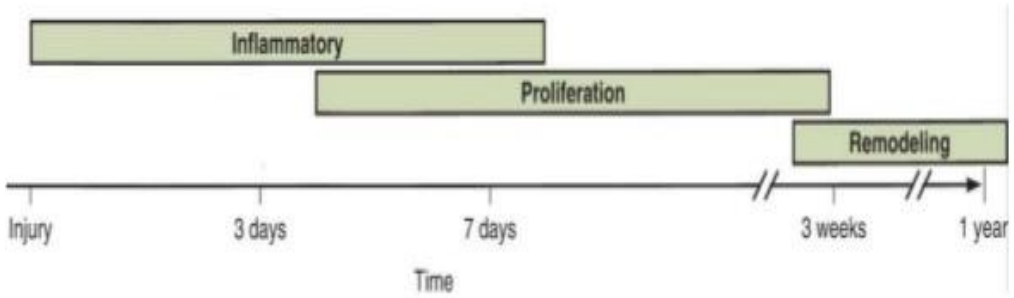
-considered high risk.

Healing of anastomosis

- Inflammatory / Lag phase.
  - 0-4 days.
- Proliferative phase- Fibroplasia.
  - 3-14 days.
- Remodelling / maturation phase.
  - >10 days.

Intestinal healing

- Occurs like other tissues
- Hemostasis & Inflammatory phase
- Proliferative phase
- Remodelling & maturing phase

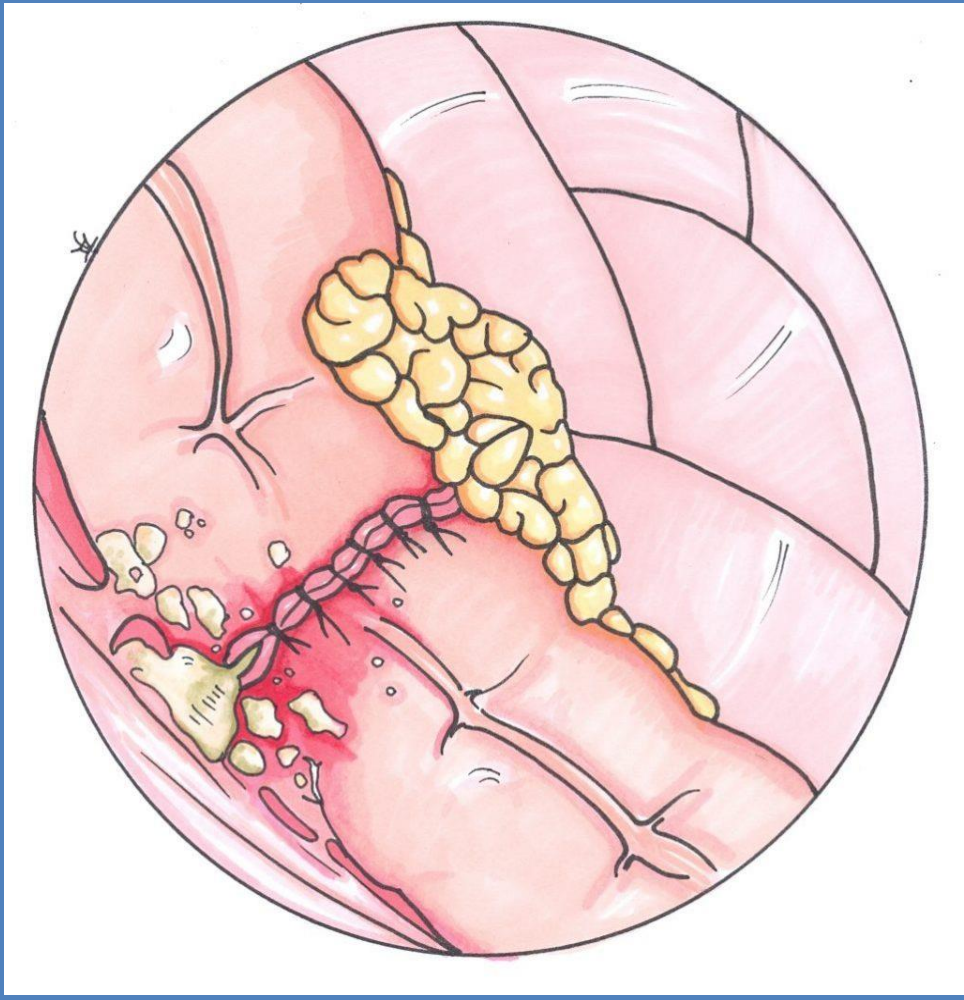


Anastomotic strength

- From collagen of submucosa.
- Low during the 1st POD.
- Early strength- on suture or stapler.
- Weakest- 3- 4th POD.

Grading of anastomotic leakage

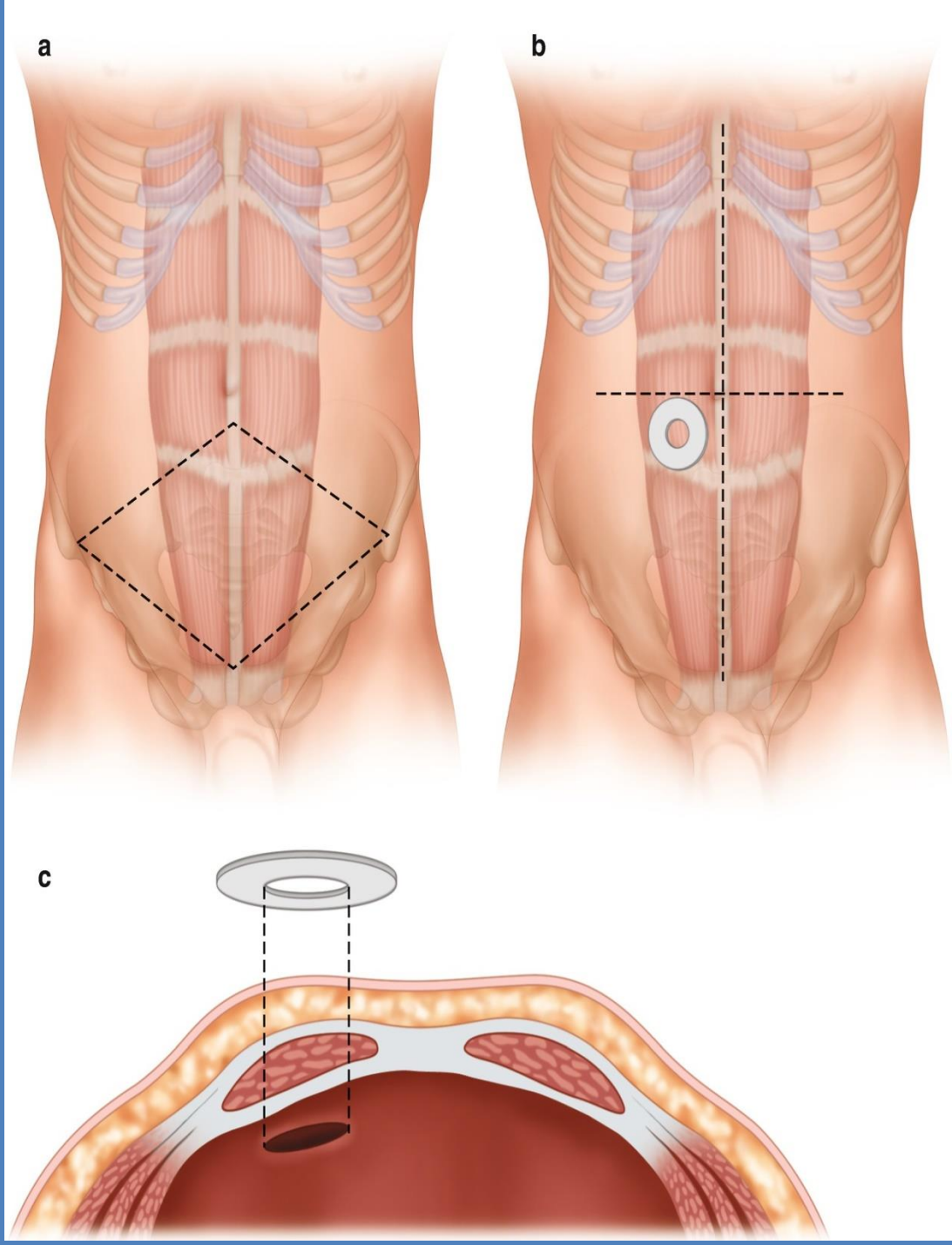
- A- leakage with-
  - Minimal or
  - No clinical impairment.
  - Require no active intervention.
- Leakage require-
  - Active intervention.
  - But manageable without surgical intervention.
- Leakage require-
  - Repeat surgical intervention.
  - Often require diversion.



Two-Piece Ostomy Bag One-Piece Ostomy Bag

Stoma triangle-

- Anterior superior iliac spine.
- Pubic tubercle.
- Umbilicus.



Indications of stoma

- Anastomosis below pertoneal reflection
- Obstruction
- Perforation
- Immunosupression
- Comorbidities
- Haemodynamic instability
- Peroperative severe blood loss
- Hypoalbuminemia-< 2.1 gm/dl
- Sepsis
- Long time steroid
- …….

Resected specimen of inflammed appendix

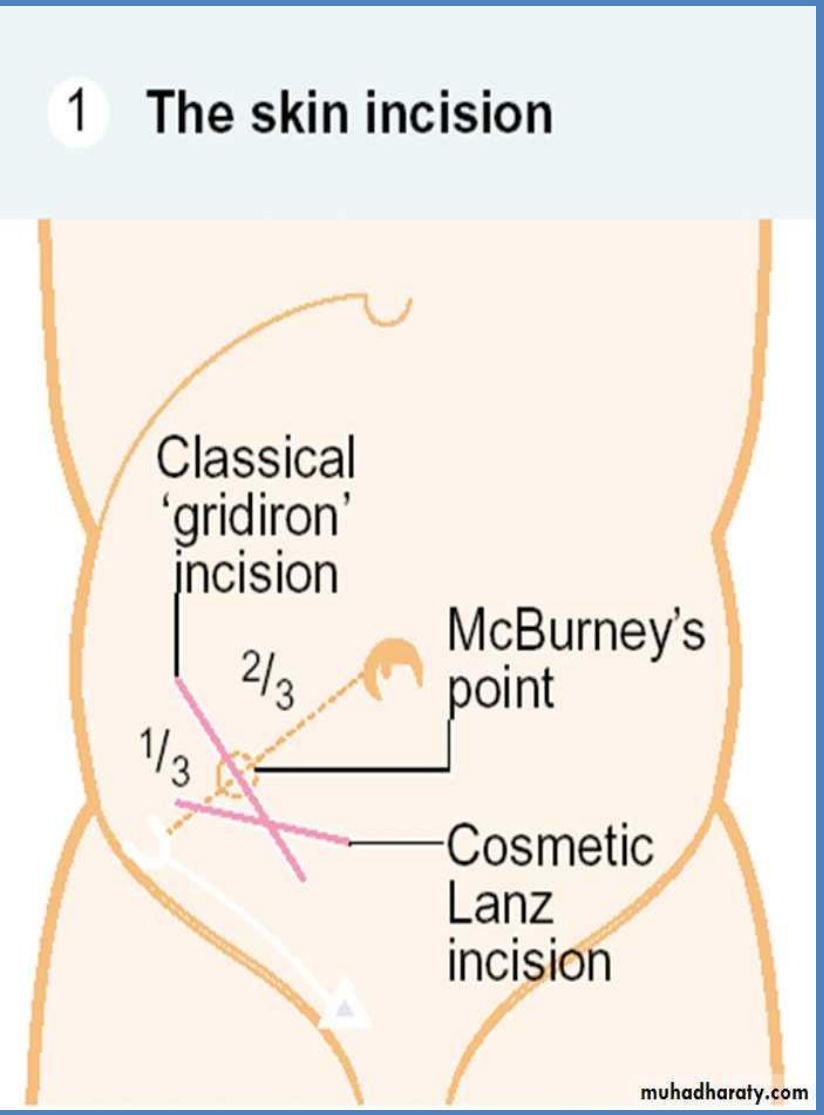
- Worm like structure.
- 1 end is blind & another end is suture ligated.
- Presence of mesoappendix.
- Appendix is distended, inflammed,
  & oedematous.

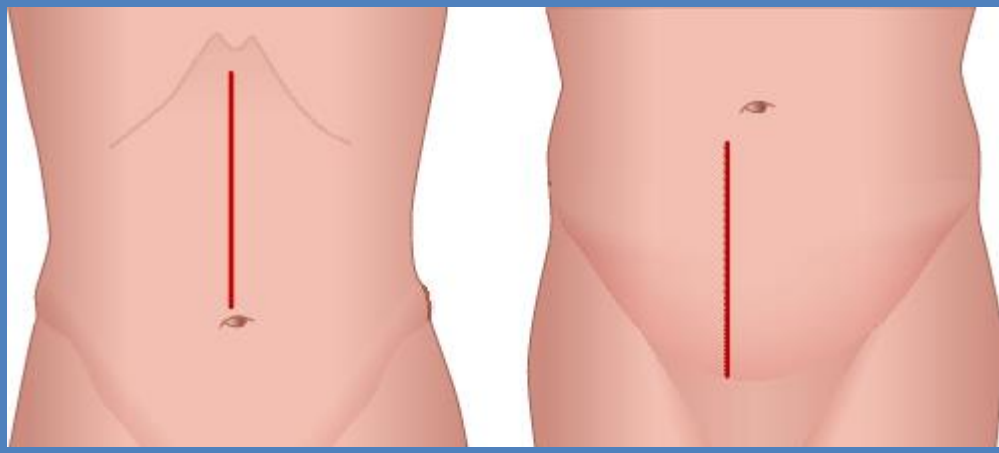
Sequelae if not treated-

- Resolution.
- Lump.
- Abscess.
- Burst.
- sepsis

Operation- appendisectomy / appendectomy.

- Lap.
- Open.





2 Per operative complications-

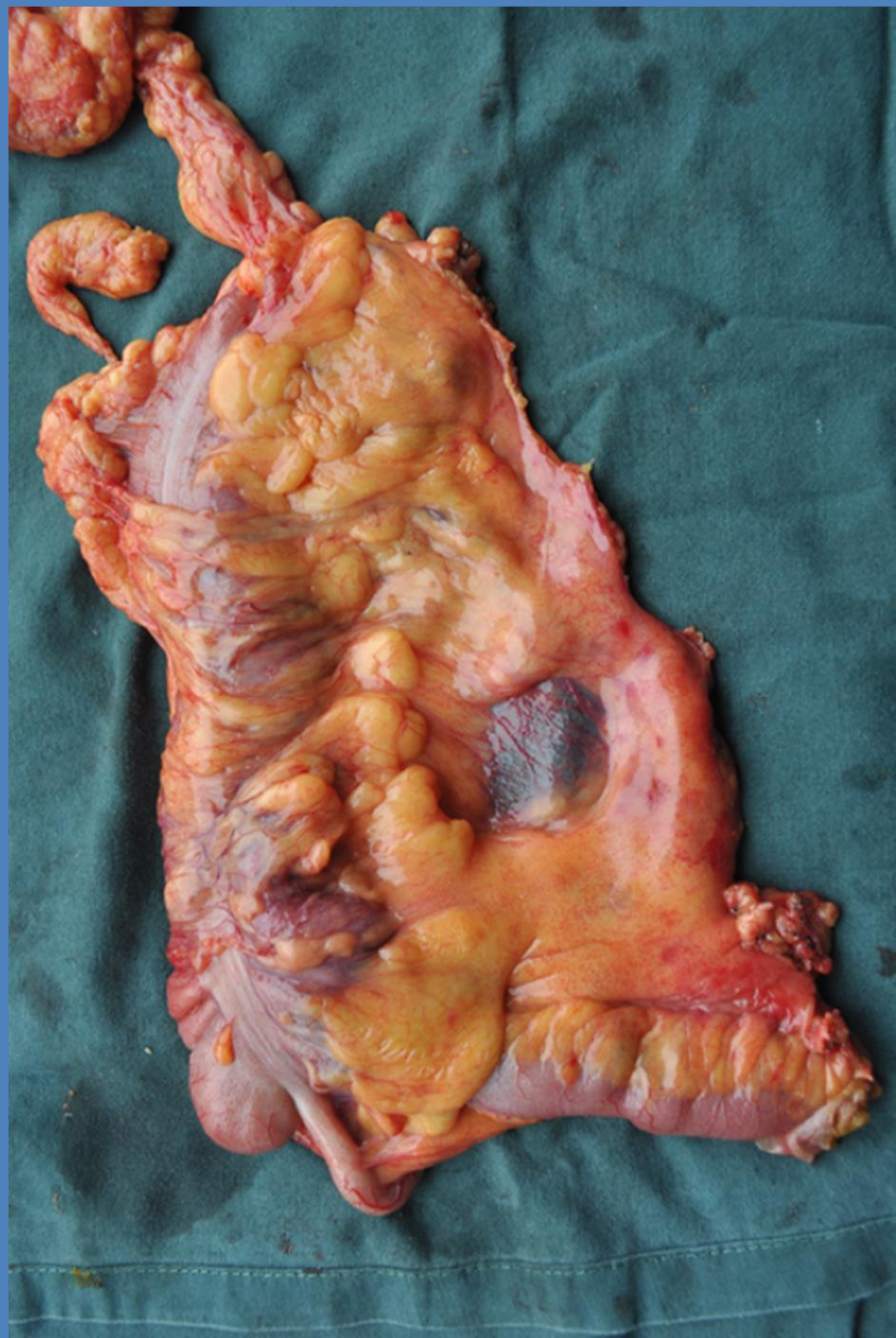
- Bleeding.
- Caecal injury.

Complications if operation not done-

- Lump.
- Abscess.
- Burst.
- Sepsis.

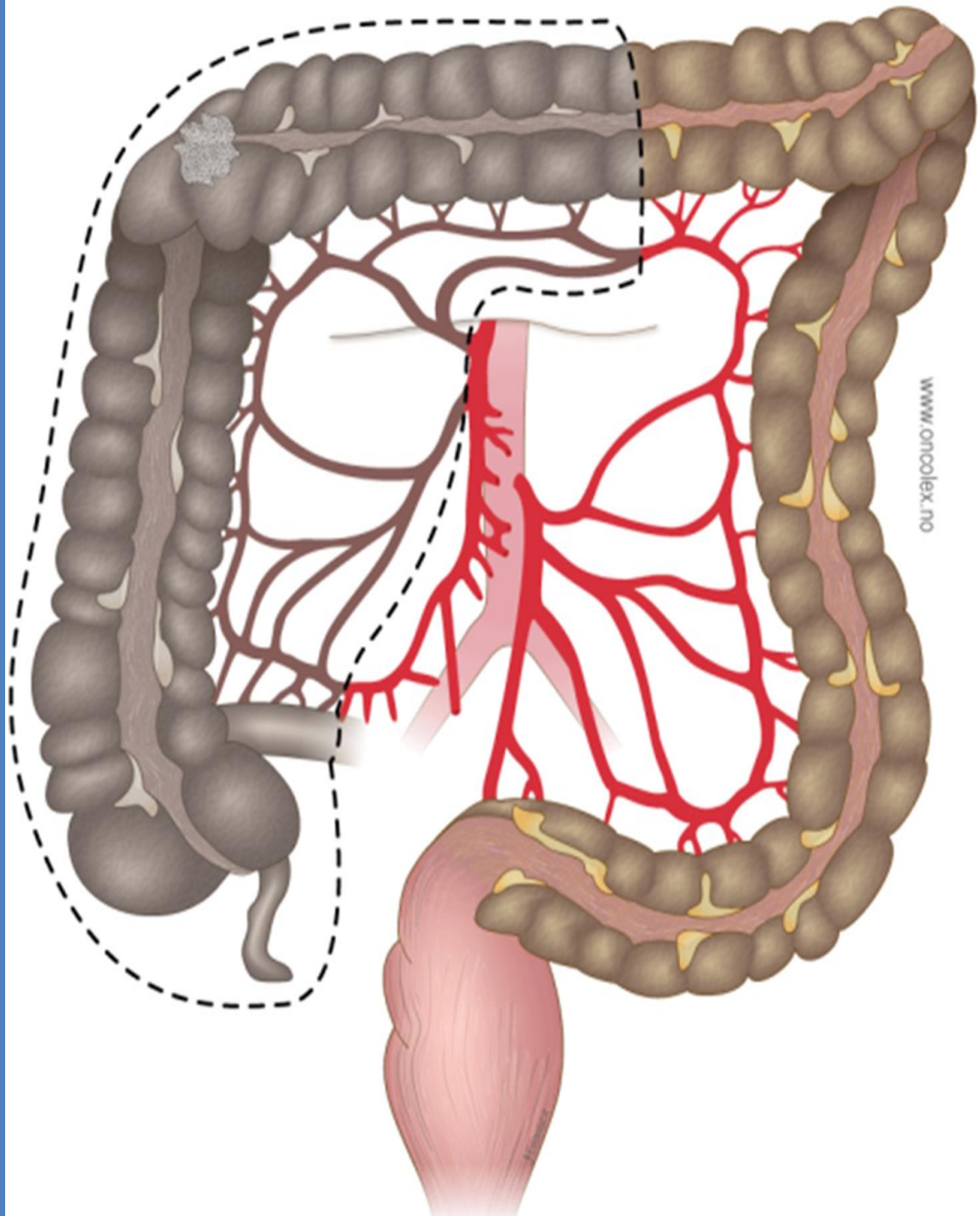
Right hemicolectomy

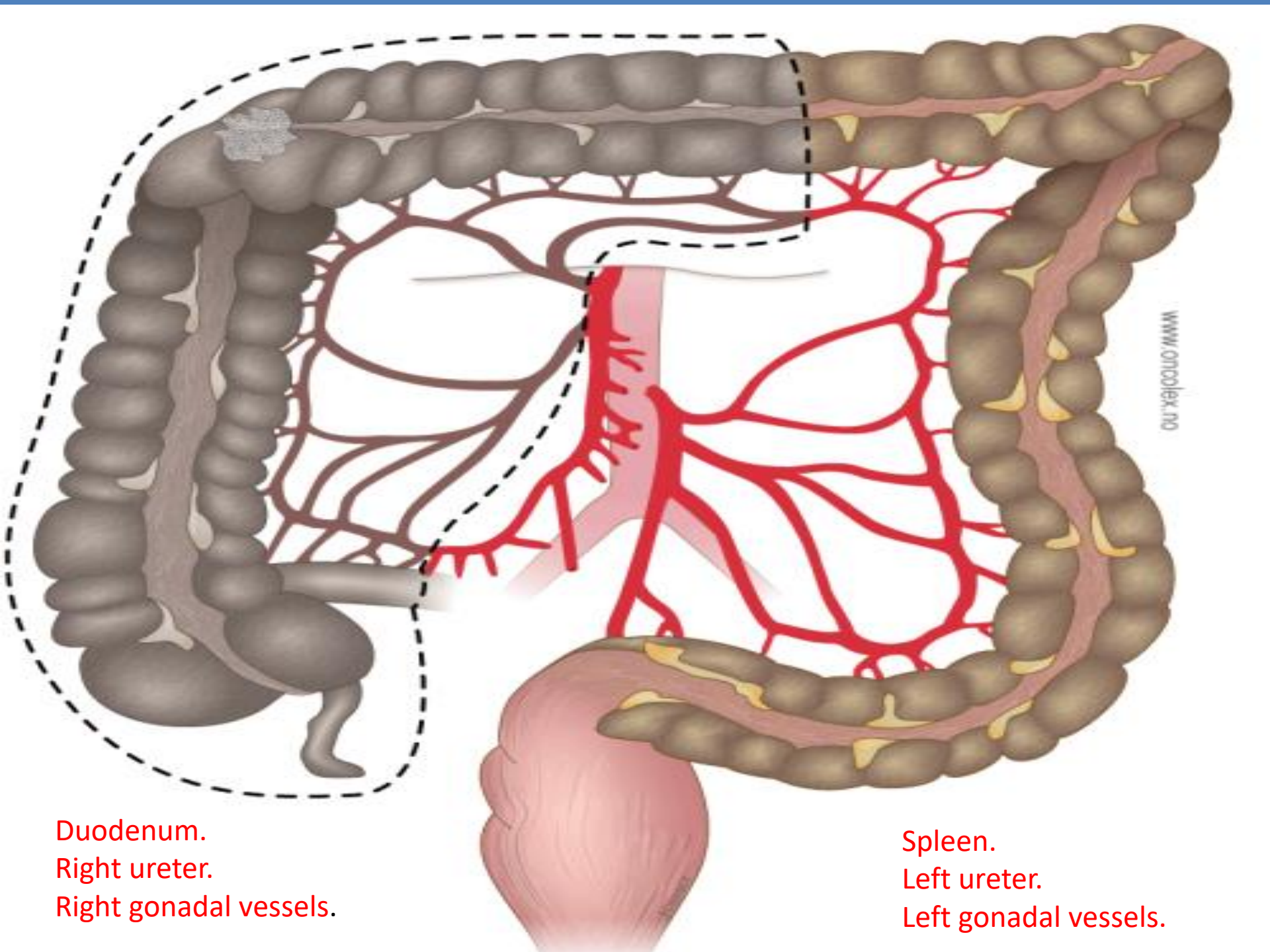
- Vessels-
  - Ileocolic.
  - Right colic.
  - Right branch of middle colic.
- Structures-
  - Terminal 15-20 cm of ileum.
  - Appendix.
  - Caecum.
  - Ascending colon.
  - Hepatic flexure.
  - Right 2/3rd of transverse colon.



PRM

- 10 cm tumor free resection margin is adequate.
- At least 5 cm should be resected.





Duodenum.
Right ureter.
Right gonadal vessels.

Spleen.
Left ureter.
Left gonadal vessels.

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