2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CASE PRESENTATION

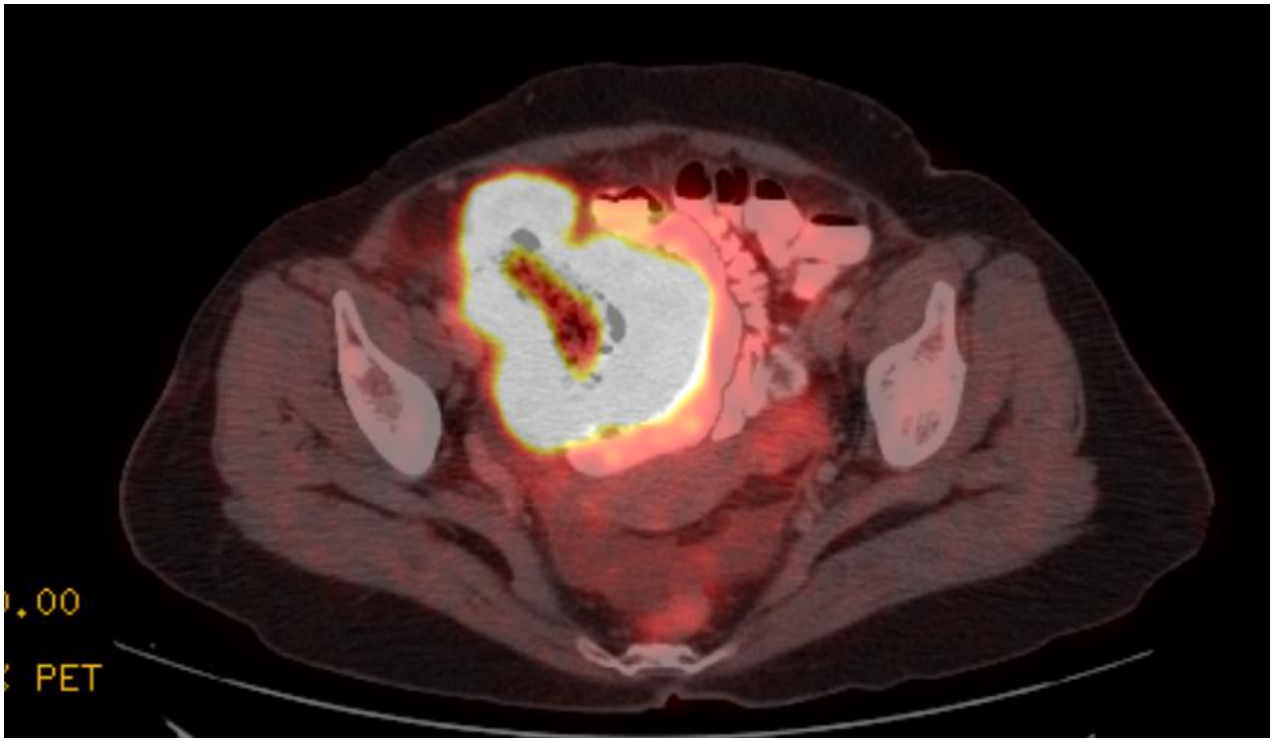
- BY DR. MOHINI GUPTA

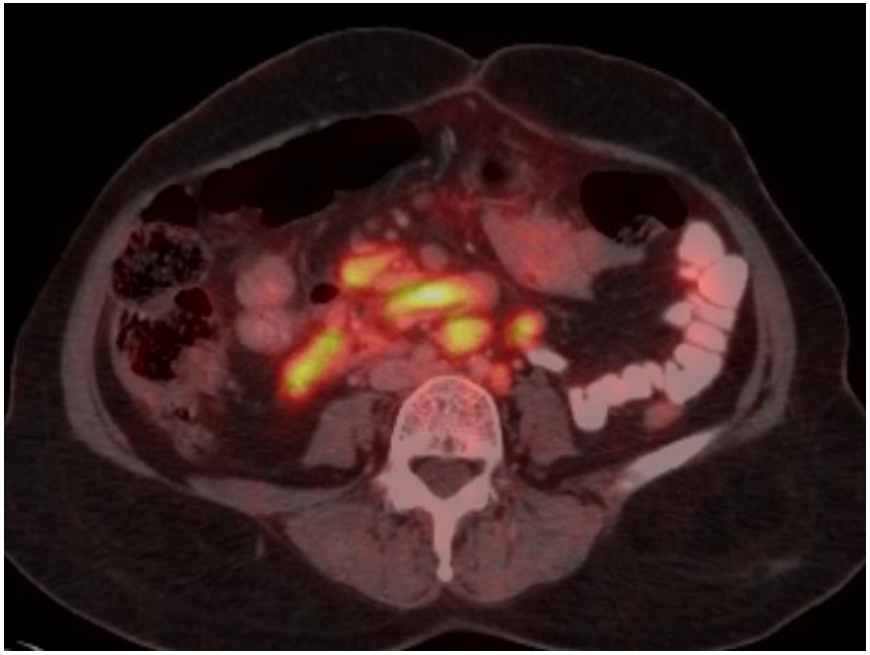
CASE 1: (MRN- 200600000041810)

- A 55-year-old female presented in surgical gastroenterology OPD with c/o recurrent episodes of RIF pain since 5-6 months.
- No c/o fever, vomiting, weight loss.
- No prior h/o TB
- Co-morbidities: Hypertension, Anemia, HBsAg positive, Retroviral negative.
- On examination: tender mass palpable in RIF.
- USG abdomen (May '22) was done outside: revealed multiple small volume abdominal lymph nodes - ? Chronic appendicitis, ? TB.
- CECT abdomen and pelvis was advised (27/09/2022)

FINDINGS:

- The appendix is within normal limits. No peri-appendiceal fat stranding or fluid.
- There is a long segment (8.3 cm), circumferential, asymmetrical, mildly heterogenous wall thickening, showing mild enhancement in distal ileum in right iliac fossa.
- There is preservation of lumen at distal ileum at the site of wall thickening.
- No evidence of luminal narrowing / intestinal obstruction / perforation.
- The terminal ileum and ileocecal valve is normal.
- There are multiple small volume to enlarged mesenteric, para-aortic, aorto-caval lymph nodes.
- Mild free fluid in pelvis.
- No evidence of mesenteric fat stranding / edema or engorgement of mesenteric vessels.
- The superior and inferior mesenteric vessels show normal opacification.
- No features s/o chronic liver parenchymal disease.





- **Hypermetabolic diffuse circumferential wall thickening in distal ileum without luminal narrowing (SUV- 39.6)**

- **Multiple hypermetabolic RP, mesenteric lymph nodes, mediastinal and cervical lymph nodes (SUV- 10.9)**

- Differentials:
  - Neoplasms- lymphoma, adenocarcinoma, metastases, GIST, carcinoid.
  - Infection
  - Ileocecal tuberculosis
  - Crohn's disease.
  - Ischemia.

LYMPHOMA

- GIT – m/c site for extra-nodal Non-Hodgkin lymphoma.
- In GIT: stomach > small bowel (distal ileum)
- Involvement of GIT- can be primary or secondary
- Criteria for diagnosis of primary GI lymphoma: (Dawson et al)

1. No palpable superficial lymphadenopathy.
2. Chest radiographic findings are normal (no adenopathy)
3. TLC and DC – normal.
4. Predominant involvement of GIT with lymph node involvement restricted to primary drainage area.
5. No involvement of liver or spleen.

LYMPHOMA

- R/F: HIV, Celiac disease, IBD, Immunosuppression
- Peak – 6th decade and another peak at around 10 years.
- M:F = 3:2

WHO CLASSIFICATION OF LYMPHOMA

- B-cell types:
  - Diffuse large B-cell lymphoma (DLBCL) (m/c GI lymphoma in adults)
  - Extranodal marginal zone B-cell lymphoma (ENMZL)
  - Mantle cell lymphoma (MCL)
  - Follicular lymphoma
  - Burkitt lymphoma
  - Hodgkin's lymphoma
- T-cell / NK cell type:
  - Enteropathy associated T-cell lymphoma (EATL)
    I. Type I – associated with Celiac
    II. Type II – CD56+, not related to Celiac

ULTRASOUND: marked hypoechoic wall thickening with widening of echogenic lumen.

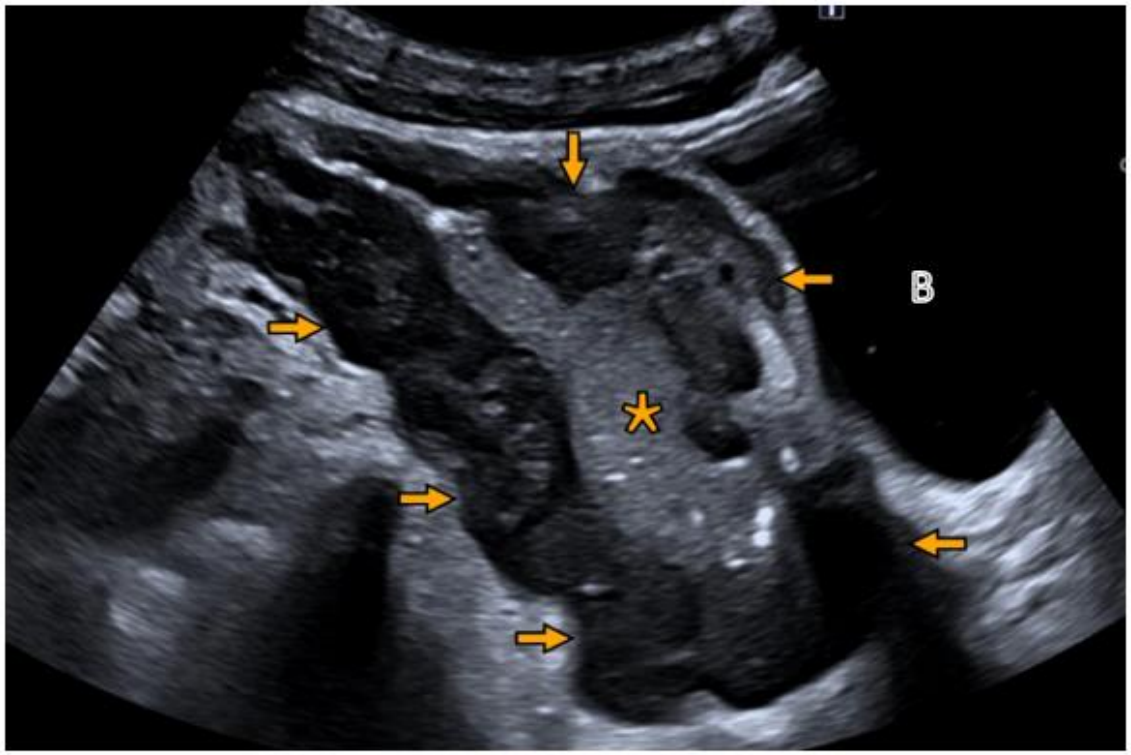


Fig 1 Thickening of bowel wall (arrows) with lumen dilatation (*).

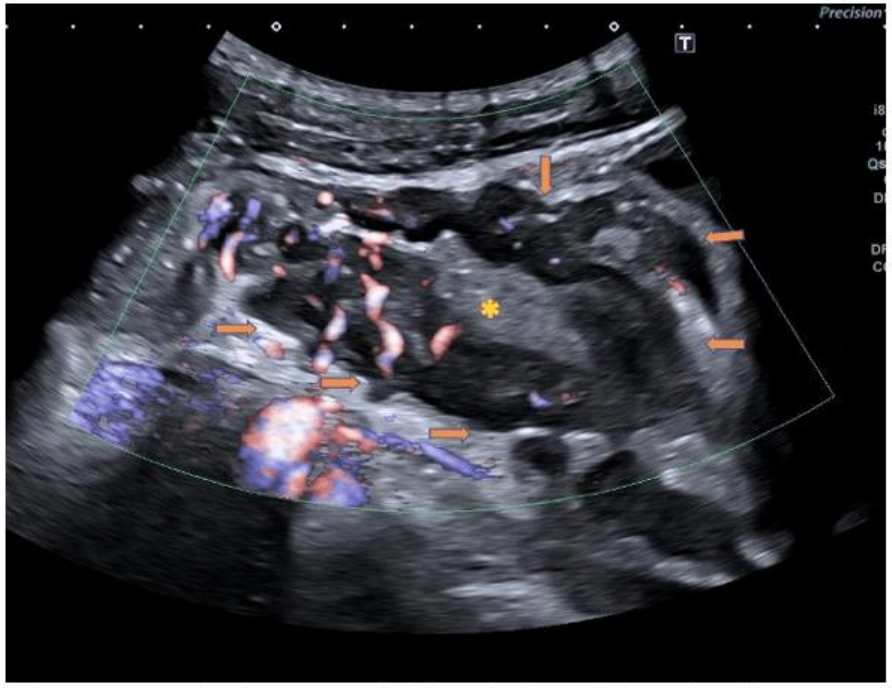


Fig 2 Increased Colour Doppler flow in the thickened wall.

FORMS OF SMALL BOWEL LYMPHOMA

- Infiltrating: most characteristic form.
- Polypoid: most common form. Polypoid mass protruding into lumen.
- Endoexoenteric with cavitation and fistulization
- Mesenteric: tumor extension into surrounding mesentery.

INFILTRATIVE FORM

- Circumferential infiltration of bowel wall – thickening.
- Barium:

Long segment marked wall thickening in terminal ileum characterized by displacement of adjacent bowel loops

Aneurysmal dilatation may be seen.

INFILTRATIVE FORM

- CT
  - Marked homogenous circumferential wall thickening involving long segment.
  - Smooth mural contour
  - Minimal enhancement
  - Lack of luminal narrowing
  - Presence of aneurysmal dilatation
  - Bulky mesenteric adenopathy
  - No desmoplastic reaction.

POLYPOID FORM

- Multiple or solitary polypoid filling defects on barium study.
- Homogenous solid nodule protruding into lumen on CT/MR study
- May be a lead point for intussusception
- Generally produced by Mantle cell lymphoma.
- May be by ENMZL and follicular lymphoma.
- D.D.: intestinal polyposis syndromes, adenoma, lipoma, GIST, metastases.

ENDOEXOENTERIC FORM

- Bowel wall thickening and a large lymphomatous mass showing exocentric growth and deep ulceration.
- Sinus tract with mesentery with resultant sterile abscess
- Fistulization with other abdominal viscera
- Barium: large barium filled cavity along the involved bowel.
- CT: gross wall thickening, large cavitating mass with extraluminal contrast into cavity which shows fluid and debris.
- D.D.: Cavitating GIST, metastatic melanoma

MESENTERIC INVASIVE FORM

- Due to direct extension of disease from affected mesenteric lymph nodes.
- Bowel wall thickening with bulky mesenteric lymph nodes.
- Sandwich sign: enlarged mesenteric lymph nodes surrounding the mesenteric vessels

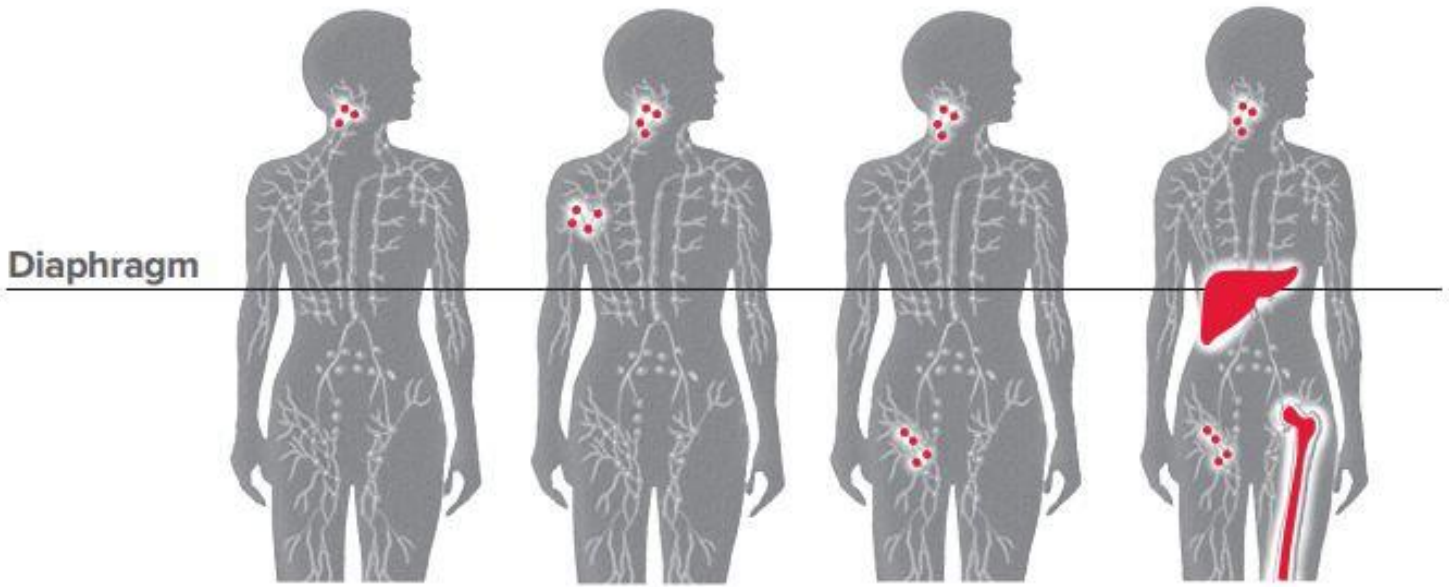
T- CELL LYMPHOMA

- Barium: thickened nodular folds with ulceration and stricture formation.
- Usually in jejunum; mostly associated with Celiac disease
- CT/MR: mild to moderate wall thickening
- Perforation - common - due to angiocentric growth of lymphoid cells with infiltration of vessel walls - vascular occlusion and ischemic necrosis.
- FDG-PET avid.
- Treatment: Surgery, CHOP regime.

STAGING OF LYMPHOMAS

- 18-FDG/PET-CT along with CECT – staging tool for all FDG avid lymphomas.
- CECT- for non-FDG avid varieties.
- Low grade follicular lymphoma and ENMZL- low FDG uptake
- DLBCL, MCL, EATL, Burkitt lymphoma, Hodgkin disease- FDG avid
- A cut-off value of SUVmax at 10 reportedly has 71% Sn and 81% Sp in differentiating aggressive and indolent lymphomas.

ANN-ARBOR STAGING FOR LYMPHOMA:



TREATMENT

- Anthracycline based chemotherapy- mainstay.
- Surgery – to reduce tumor bulk, manage complications, staging.
- RT- bulky residual disease or in cases of partial resection.

PATIENT MANAGEMENT:

- Laparoscopy with open retroperitoneal lymph node excision and ileal resection anastomosis
- Chemotherapy – R-CEOP (3 cycles)

(Rituximab, Cyclophosphamide, Epirubicin, Vincristine, Prednisolone)

R-GDP (Rituximab, Gemcitabine, Dexamethasone, Cisplatin)

DEPARTMENT OF LABORATORY MEDICINE

Final Report

Patient Name : **Ms Suvarna Gangadhar Pattar** MRN : **20060000041810** Gender/Age : **FEMALE , 56y (13/08/1966)**

Collected On : **08/11/2022 03:02 PM** Received On : **08/11/2022 05:22 PM** Reported On : **15/11/2022 04:49 PM**

Barcode : **062211080029** Specimen : **Body Tissue** Consultant : **Dr. Ashwinikumar Kudari(SURGICAL GASTROENTEROLOGY)**

Sample adequacy : **Satisfactory** Visit No : **IP-002** Patient Mobile No : **8951587050** Rectified On : **15/11/2022 04:51 PM**

HISTOPATHOLOGY

REGULAR HP LARGE SPECIMEN

CASE No.	H-9110/22
CLINICAL DETAILS	K/C/O lymphoproliferative disorder. PET CT: Hypermetabolic differ circumferential wall thickening in distal ileum without lumen narrowing. Clinical diagnosis : Ileal mass + Retroperitoneal mass for biopsy.
SPECIMEN DETAILS	1. Retroperitoneal mass 2. Ileal mass.
GROSS EXAMINATION	Received a specimen of small intestine measuring 25.0 cm in length. External surface shows irregular mass (ruptured) measuring 14.0 x 12.0 x 7.5 cm, situated 12.0 cm from one resected margin, 11.5 cm from other resected margin. On cut opening, the mass is to seen arise from the muscle coat, Grossly no other lymph nodes identified along the mesentery. Also seen separately lying in the same container is the same tumor mass measuring 7.0 x 5.0 x 4 cm. Representative sections processed in capsules BLOCK CODES: A & B: Tumor sections from site of rupture. C to E: Tumor with overlying mucosa. F to K: Tumor sections (F & G: Serosa) L & M: Tumor with external raw surface. N: One resection margin P: Other resection margin Q & R: Separately lying mass. Grossed by Dr. Nisheena R.
MICROSCOPIC EXAMINATION	Sections studied shows a neoplasm composed of sheets of large atypical lymphoid cells. The cells have high NC ratio, round to oval

vesicular nuclei, irregular nuclear contours, indistinct nucleoli and scanty cytoplasm. Increased mitotic activity noted. The tumor cells are separated by thin fibrous septae. Areas of the necrosis seen.

The tumor is seen to arise from the muscularis propria of the small intestine an infiltrate the serosa .

Both resection margins are free of tumor

The overlying mucosa is inflamed and ulcerated by the mass

IMMUNOHISTOCHEMISTRY DONE ON H-9110 /22 C AT NARAYANA HEALTH BANGALORE

Internal and external controls are satisfactory.

CD 20 and LCA stain highlights the atypical lymphoid cells (Strong and diffuse)

CD 3 and Pan CK is negative in the neoplastic cells.

CD10, BCL2 and BCL6 strong and diffusely positive in the tumour cells.

Ki 67 proliferative index is about 95%

MUM 1 is negative in the tumour cells.

IMPRESSION

FINAL IMPRESSION:

The above morpho-immunophenotype is consistent with **HIGH GRADE B CELL TYPE NON HODGKIN`S LYMPHOMA - DIFFUSE LARGE B CELL LYMPHOMA, GERMINAL CENTRE TYPE, ILEAL MASS.**

IHC clones:

BCL-2 100-D5 BIO-CARE

CD3 PS1 BIO-GENEX

CD5 4C7 BIO-GENEX

CD10 SP67 VENTANA

CD20 L-26 BIO-GENEX

KI-67 M1B-1 BIO-GENEX

Typed by Dr Nisheena.R / Sujatha

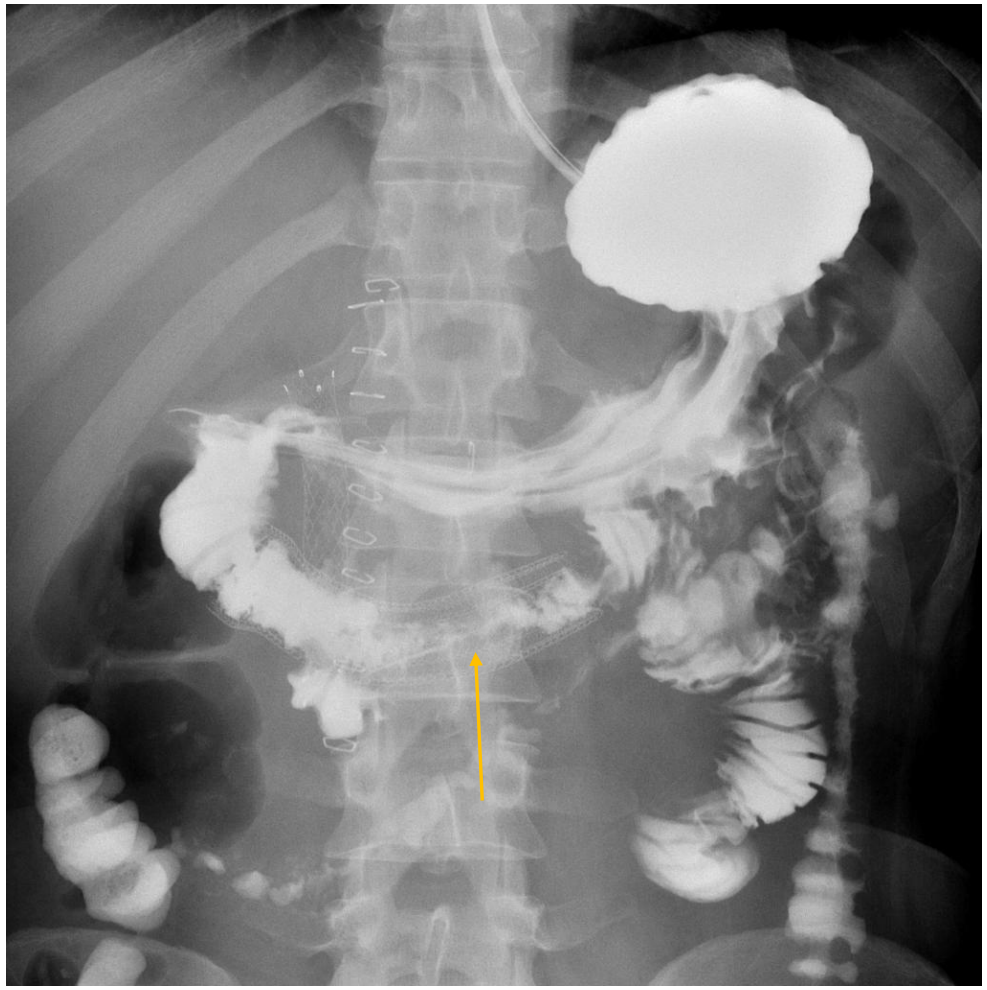
--End of Report-

ADENOCARCINOMA

- 6TH-7TH decade, M>F.
- Most common sites: duodenum, jejunum (ileum – Crohn's disease)
- Risk factors: Peutz Jeghers syndrome, Lynch syndrome, Cowden disease, Gardner's syndrome, Crohn's disease, Celiac disease.
- Early tendency to metastasize due to invasion of mucosal tumors into lymphatics.

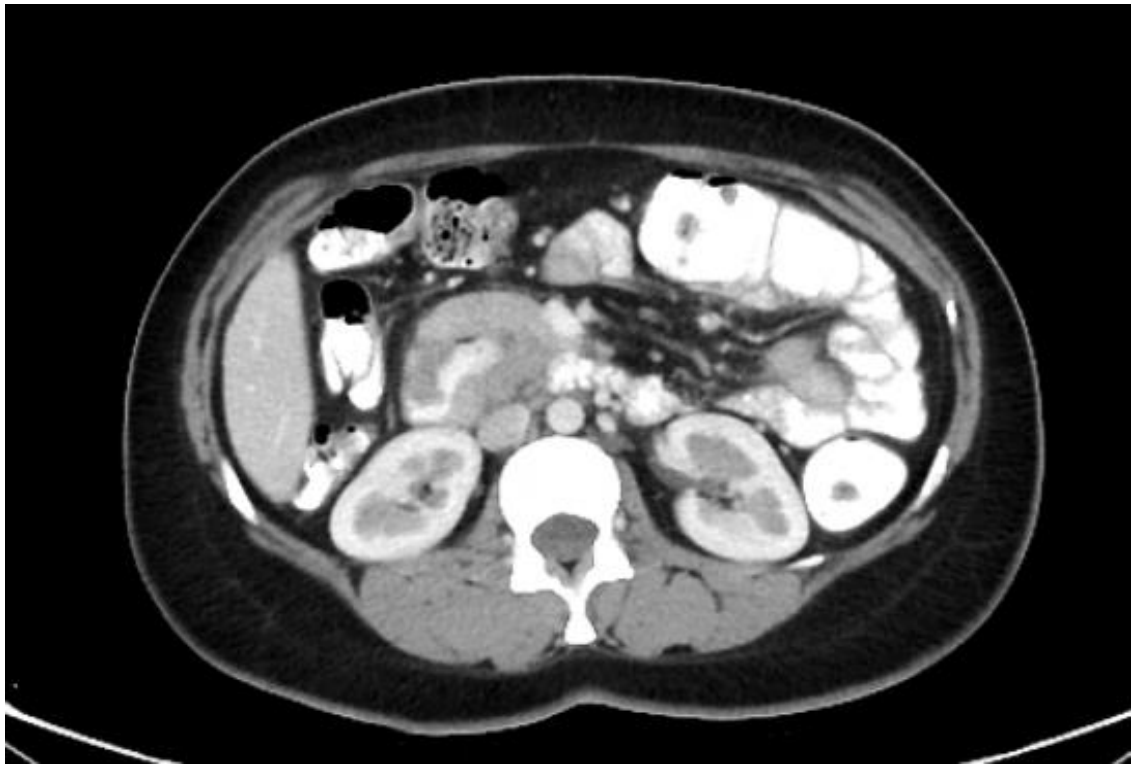
BARIUM MEAL FOLLOW THROUGH

- Short segment filling defect in 3rd part of duodenum, seen in delayed images.
- May show overhanging margins- appear as 'apple-core' lesion.



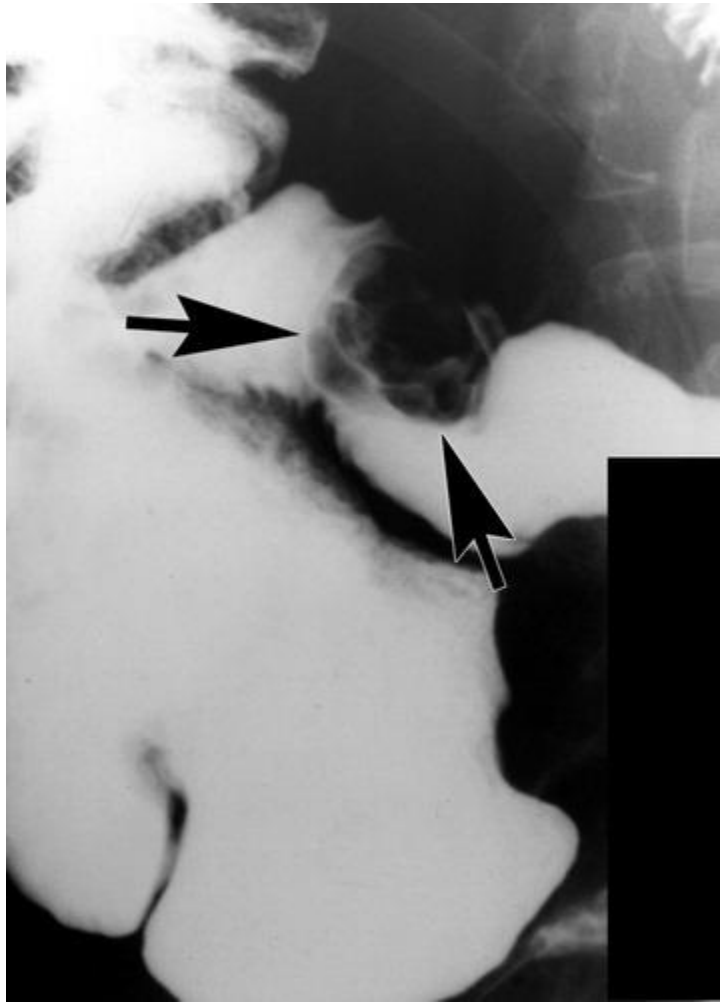
CT/MR

- Focal moderate wall thickening with overhanging margins.
- Polypoid mass
- Heterogenous moderate enhancement
- Associated findings: peri-lesional fat infiltration, lymphadenopathy, hepatic and peritoneal metastases, SBO common.
- PET-CT: avid uptake



CARCINOID

- Most common site in small bowel: ileum
- Submucosal tumors which may protrude intramural masses or protrude into lumen forming polypoid nodules.
- Desmoplasia- serotonin / growth pattern



BARIUM

- Smoothly marginated intraluminal polypoid mass
- Bowel wall thickening with luminal narrowing

CT

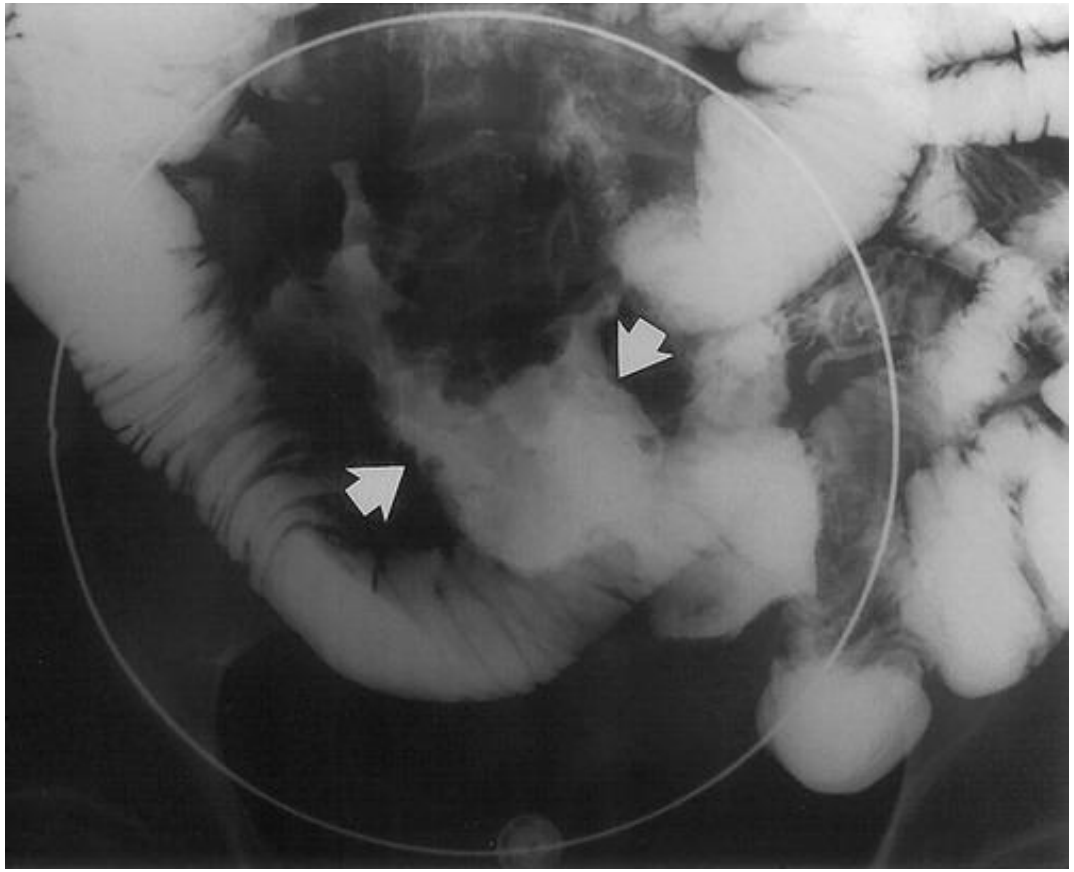
- Solitary or multiple hyper-enhancing polyps.
- Concentric mural thickening with focal soft tissue tumor mass adjacent to it.
- Mesenteric lymphadenopathy, stranding, retraction.
- Calcification in masses common.
- Mesenteric fibrosis- kinking of involved intestine, 'spoke wheel' or 'sunburst' pattern of radiating mesenteric vessels.
- Hepatic metastases
- Somatostatin analogue I-111 octreotide or DOTANOC- PET-CT avid.

GASTROINTESTINAL STROMAL TUMORS

- Mesenchymal tumor, arise from interstitial cells of Cajal, express KIT protein- CD117 A tyrosine kinase receptor. Diff from true smooth muscle tumors.
- Well circumscribed mass without true capsule, focal areas of hemorrhage, cystic degeneration or necrosis can be seen.
- May arise from outer muscular layer of GIT and tend to grow exophytically, projecting into abdominal cavity.

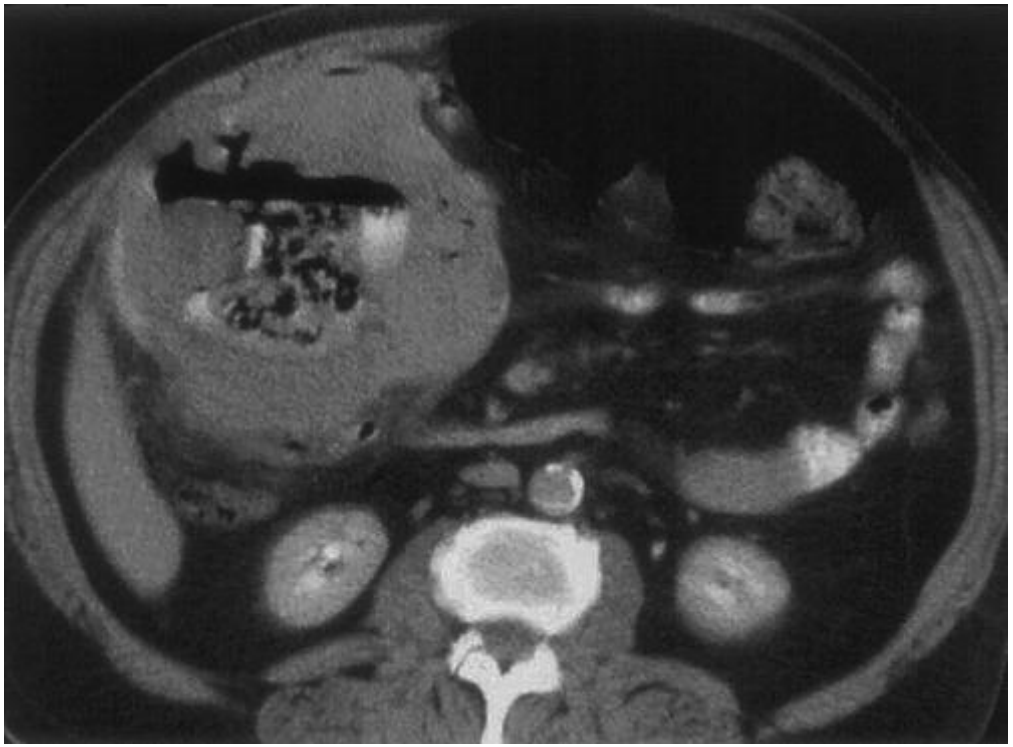
BARIUM

- Extraluminal mass exhibit mass effect on affected segment.
- Barium may extend from intestinal lumen into mass
- Cavity or fistula may be seen.



CT

- Bulky exophytic mass, lobulated
- Heterogenous due to necrosis, hemorrhage, cystic degeneration.
- Internal gas, cavitation, fistulization.
- Inhomogenous patchy enhancement
- Usually, no obstruction
- Small GIST- polypoid
- Liver and peritoneal metastases
- Nodal metastases- uncommon
- F-18 FDG PET avid (few are not)



ILEOCECAL TB

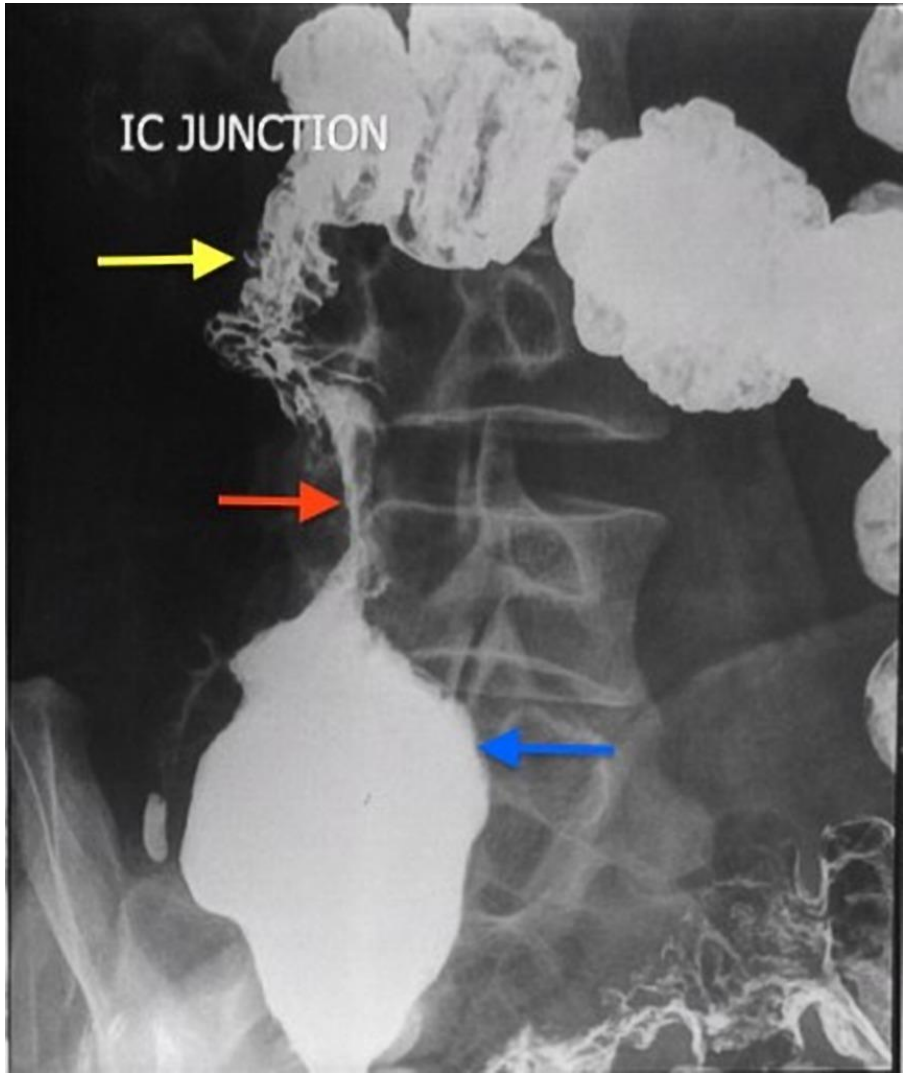
- 3 morphological types: ulcerative (60%), hypertrophic (10%), ulcerohypertrophic (30%)
- Ulcerative- immunocompromised
- Hypertrophic – immunocompetent

BARIUM

Yellow arrow indicates shrunken caecum and pulled up caecum.

Red arrow indicates stricturing and narrowing of terminal ileum and ileocecal junction.
Terminal ileum may appear hanging down and stretched from contracted caecum – goose neck deformity.

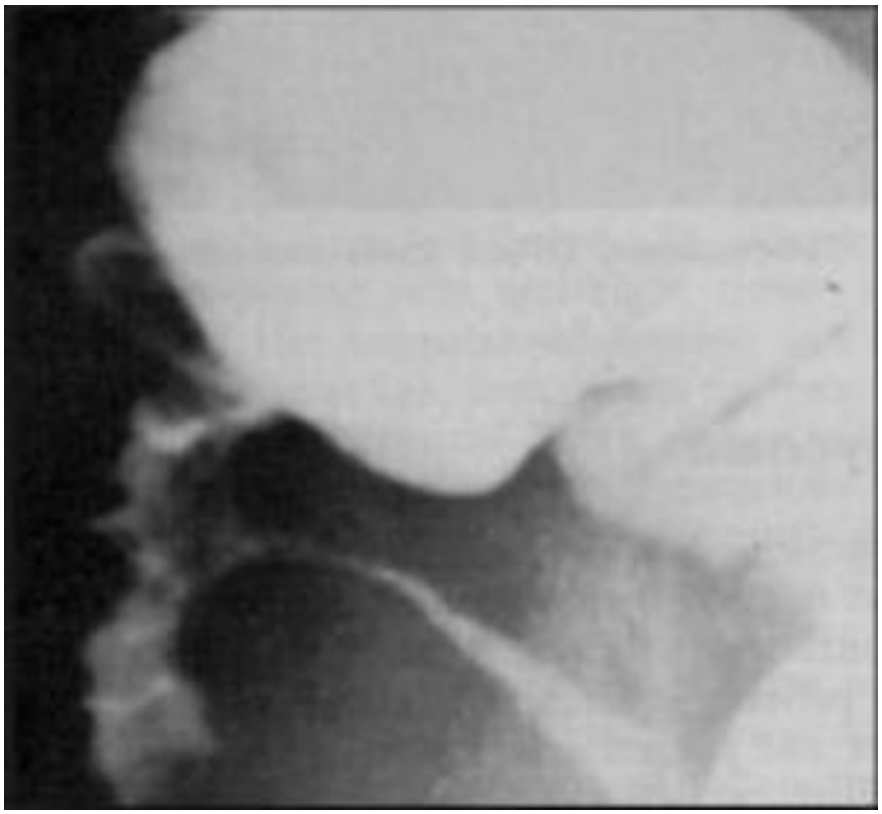
Blue arrow indicated proximal ileal dilatation



- FLEISCHNER SIGN

Or inverted umbrella appearance.

Edematous thickening of ileocecal valve with narrowing of terminal ileum.



- Stierlin sign

Persistent narrowing of terminal ileum which is emptying directly into ascending colon with non-visualization of caecum.

CECT IN TB

- Bowel wall thickening
- Mesenteric lymphadenopathy, calcification, necrosis
- Peritoneal and solid organ involvement
- CTE: EARLY- stratified wall thickening in distal ileum, ileocaecal junction and caecum which can progress to more severe homogenous wall thickening and narrowing leading to obstruction.
- Clumping of bowel loops, adhesions, mesenteric changes, cocoon formation.

ENCAPSULATED PERITONEAL SCLEROSIS (ABDOMINAL COCOON)

- Clumped dilated small bowel loops which are encapsulated by a thick membrane.
- Associated ascites.

EXTRA-INTESTINAL TB

- Ascites: free / loculated
- Tuberculous ascites: low SAAG <1.1 g/dl
- Elevated adenosine deaminase and lymphocytes
- Mesenteric fat stranding, thickening, nodularity, diffuse infiltration or abscess formation.
- Omental smudged nodular thickening or caking
- Lymph nodal TB:
  - Enlarged with peripheral enhancement and central necrosis- specific
  - Matted or conglomerate
  - Calcification

Differential diagnosis	Points in FAVOR of diagnosis	Points AGAINST the diagnosis
Adenocarcinoma	Asymmetric, circumferential bowel wall thickening. Significant (> 2cm) thickening Homogenous gray attenuation	Site: duodenum, jejunum. Short segment (< 5 cm) **Mesenteric fat stranding** Moderate enhancement **Luminal narrowing** May cause obstruction
Malignant GIST	Site: ileum, jejunum Asymmetric thickening Rarely cause obstruction Gray attenuation	**Exophytic growth** Heterogenous enhancement Lobulated mass; necrosis **No lymphadenopathy** Hyper vascular liver mets
Carcinoid	Site; ileum, appendix. Asymmetric thickening Lymphadenopathy	**Endophytic / exophytic** Calcification +/- **Bright enhancement** Desmoplastic reaction
Metastases	Multifocal Asymmetric thickening	**Short segment** wall thickening or polypoid May cause obstruction Mucinous mets – calcification +/-

Differential diagnosis	Points in FAVOR of diagnosis	Points AGAINST the diagnosis
Ileo-cecal tuberculosis	Circumferential bowel thickening Homogenous attenuation Multifocal Lymphadenopathy Ascites	Active- diffuse inflammatory infiltrates **Normal ileocecal valve and terminal ileum.**
Crohn's	Multifocal m/c site: terminal ileum Asymmetric thickening in long-standing cases Homogenous attenuation in chronic Short/ intermediate segment	Eccentric, mild wall thickening Mesenteric fat stranding, edema Mucosal arterial enhancement **Comb sign** **Creeping fat, fat target attenuation** Mural stratification in active cases

Differential diagnosis	Points in FAVOR of diagnosis	Points AGAINST the diagnosis
Infection	Intermediate/long segment wall thickening Lymphadenopathy Site: terminal ileum by Yersinia.	**Mesenteric fat stranding** Mild, **symmetric**, diffuse wall thickening **Mural stratification**
Ischemia	Marked wall thickening (venous) Ascites	**Mesenteric edema** **Symmetric, mild wall thickening (arterial)** **Altered bowel wall enhancement** **Collaterals** Mural stratification Pneumatosis +/-

BOWEL WALL THICKENING

FOCAL (< 5 CM)

Irregular, asymmetric, heterogenous

Neoplasm – primary, secondary

Exceptions: Granulomatous disease (Crohn's, TB)

Regular, symmetric, homogenous thickening with no significant fat stranding

Consider Small or well differentiated adenocarcinoma

Fat stranding disproportionately more severe wall thickening

Inflammatory- Diverticulitis, Appendagitis, Omental infarction, Appendicitis

SEGMENTAL (6-40 CM) / DIFFUSE (> 40 CM)

= Benign (EXCEPT Lymphoma)

Based on pattern of attenuation:

1. White attenuation: Acute IBD, Shock bowel, Reperfusion after ischemia, Hemorrhage.
2. Grey attenuation: Chronic Crohn's, Ischemia, Neoplasm.
3. Target- white: Portal hypertension, infection, acute IBD, Typhlitis, AIDS, Ischemia.
4. Target- fat: Chronic IBD, obesity, Post chemotherapy, Celiac disease.
5. Gas: Ischemia, Infection, Trauma, Benign causes (COPD, IBD, Connective tissue disorders), Pseudo-pnumatosis.