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Review Article

Imaging Spectrum of Large Intestinal Lesions: A Pictorial Essay

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Abstract: Evaluating colorectal lesions by means of radiographic imaging continues to play a major role in detecting and staging cancer of the lower gastrointestinal tract. The diagnosis of large bowel lesions namely Colitis, Vascular and Neoplasm had traditionally been made on the basis of barium enema and/or colonoscopy. Cross sectional imaging as Computed tomography scanning (CT) and MRI plays a pivotal role in the evaluation of patients with nonspecific and in acute abdominal complaints to achieve an accurate diagnosis. The objective of this pictorial essay is to provide a review of the diseases involving the large bowel with an emphasis on the radiologic differentiating features by cross sectional imaging.
Keywords: Bulabai karpagam, Colonic lesions, Colitis, Sigmoid volvulus, Colonic Bezoar, Colonic wall thickening.

INTRODUCTION

Colo-rectum can be affected by variety of diseases which can be categorized into infective (bacterial, viral, actinomyces, protozoal etc), inflammatory (ulcerative colitis, crohn's disease, radiation colitis etc), vascular (ischemic), neoplastic (benign and malignant) and miscellaneous – bezoar, volvulus, intususception etc. CT has become the most important imaging technique for evaluating the abdomen and pelvis, particularly the bowel loops. CT scanning can determine the nature and thickness of the colonic wall involved and depict the relationship of the lesion with surrounding structures and abdominal metastases. Other modalities that are complementary include transrectal & transabdominal ultrasonography, Barium, MRI and Positron emission tomography (PET).

Normal bowel

The normal distended colonic wall usually measures less than or equal to 3 mm. Wall measurements greater than 5 mm in diameter are considered abnormal in collapsed state . Extracolonic tumor spread is suggested by loss of the normal black-appearing pericolonic fat. Abnormal air density in surrounding structures may represent an associated fistulous tract with the tumor [1, 12].

After the administration of intravenous contrast material, in the late arterial phase the mucosa is the most intensely enhancing layer of the bowel wall and when enhanced may appear as a distinct layer, the submucosa is less vascularised and is seldom seen as a separate structure on CT scans unless it is oedematous, haemorrhagic or infiltrated by fat [1].

The various abnormal conditions of colon were reviewed in literature based on (1) Degree of bowel wall thickening: symmetric thickening versus asymmetric thickening (2) Length of involvement : focal, segmental, or diffuse involvement (3) Attenuation pattern of bowel wall thickening (4) Perienteric abnormalities [1].

Four patterns of mural enhancement are noted with contrast enhanced CT: (A) target appearance (double-halo) as in Ischemic bowel, (B) homogeneous hyper enhancement (white sign) as noted in Inflammatory Bowel disease (IBD) and shock bowel syndrome, (C) heterogeneous enhancement noted in malignant growth and (D) decreased or absent enhancement (grey sign) as in chronic IBD, lymphoma and carcinoma [1, 2]

Distinction should be made between focal (less than 5 cm), segmental (6-40 cm) or diffuse (>40 cm)

involvement. This is an important step in differentiating between benign and malignant causes of bowel wall thickening. While most bowel tumors present as a focal involvement, segmental and diffuse thickening of the bowel wall are usually caused by benign conditions, such as ischaemic, infectious and inflammatory diseases. The exception is a small bowel lymphoma, which typically shows a segmental distribution. The potential limitation of CT is with positive oral contrast in evaluation of bowel lesions in which the mucosal enhancement may be obscured by the luminal contrast material, and thus the pattern of enhancement may be impaired. Preferably "Neutral contrast" with an attenuation of water (10-30 H) can be used with IV contrast material in dilated bowel loops. CT aids in differentiating the lesions of various etiology and other modalities as Barium. Ultrasound and MRI are complimentary, with correlative analysis aiding in accurate diagnosis and appropriate management [1, 2, 5].

Colitis

Causes of colitis are IBD: UC and Crohn's, Infectious colitis, Ischemic colitis, Diverticulitis, Neutropenic colitis and Drug-related colitis. Colitis may cause diffuse or focal involvement according to etiology. Diffuse Colitis is commonly due to Ulcerative Colitis (or left), CMV (or right), E. coli and Campylobacter. Right sided colitis **is** commonly due to Crohns, TB, Yersinia, Salmonellosis, and Amebiasis. On left, shigellosis, Schistosomiasis and Lymphogranuloma are common. Nonspecific imaging signs are noted in colitis - as wall thickening, target sign, Hyperemia (comb sign) and pericolic stranding markedly noted in infective colitis [1-3].

Tuberculosis

In endemic areas, about 10% of gastrointestinal tuberculosis involves the colorectal and can cause strictures, colitis and, rarely polyps. In its chronic form of tuberculosis results in colonic strictures, ileocecal valve deformity, ulcerations, polyps, and fibrous bands, with the right colon and ileum being most often involved. Other features of cecal lumen narrowing with wide gaping ileocecal valve, often with deformed and thickened valve lips, is a characteristic finding on radiological investigations as Barium and CT but not always present. Colonic involvement tends to be segmental , at times involving multiple sites [4]. A tuberculosis stricture often mimics a benign appearing colonic stricture such as is seen in Crohn's disease and ischemic stricture. Rarely, colonic tuberculosis manifests as a diffuse pan colitis (Fig. 2). Fistulas and sinus tracts are less common than with Crohn's disease. In our series 19years old female with non specific abdominal complaints CT scan revealed diffuse wall thickening involving cecum and ascending and transverse colon , thickening of the mesenteric folds and large necrotic loco regional lymph nodes. Right apical segment of lung also showed bronchopneumonia (Fig. 3a, b).

Other infections

The most common source of infection involving the rectum is anorectal inflammatory disease, but the infection may also be due to rectal perforation, a surgical procedure, or trauma. Abnormalities include inflammatory edema, cellulitis and abscess. MRI is useful for distinguishing between supralevator and infralevator abscesses .Stratified pattern of attenuation on contrast CT commonly noted in infective ischemic colitis, Typhlitis and AIDS. In *E. coli* colitis, CT may show non specific findings as colonic wall thickening, target sign, pericolonic stranding and with variable distribution pattern (Fig. 1a, b) [2]. Amebic colitis generally spares the distal ileum and skipped lesions may also noted. Extended submucosal ulcer with intramural dissection is the characteristic CT finding of fulminant amebic colitis.

Radiation enterocolitis

The signs include evidence of submucosal thickening, single or multiple stenoses, adhesions and sinus or fistula formation. In the acute phase, radiation affects bowel mucosa causing ulceration, and inflammation with submucosal oedema. In the subacute and chronic phases fibrosis or target sign with fat density at submucosal layer can occurs (Fig. 1c). Additionally radiation induced endarteritis obliterans, which results in a state of chronic mesenteric ischaemia leading to bowel strictures [5].

Bowel ischaemia

CT sign of bowel ischemia is non specific. The CT features depends on pathogenesis of the ischemia whether arterial occlusive (60-70%), veno-occlusive (5-10%) or hypo perfusion (20-30%), the severity of ischemia and superimposed hemorrhage or infection. Distribution is often "watershed" colon segment, commonly at splenic flexure [6]. The stratified pattern of attenuation may be an early finding of bowel ischemia, due to sub mucosal edema or due to hyperemia of the mucosa and serosa. This finding should be correlated with occlusion of the mesenteric artery or vein, bowel dilatation, engorgement of the mesenteric veins, and mesenteric edema and ascites (Fig. 4). Intestinal pneumatosis and gas in the mesenteric or portal veins are indicative of severe ischemia and are usually associated with the thinning rather than thickening of the small bowel wall due to bowel wall necrosis.

Ulcerative colitis (UC)

Is an inflammatory process affecting colonic mucosa and rectum is affected in 95% of cases, circumferentially extending along the proximal intestine. This is usually a pan colitis, and in a minority of patients may cause edema of terminal ileum without ulceration differentiating it from Crohn's disease.

Colonoscopy and barium enema are the principle methods of evaluation of UC, reveals granular mucosal ulcerations, surface problem and the intestinal caliber. CT plays a role in depicting the transmural involvement, intra peritoneal and extra bowel complications [7]. On CT the "Grey halo sign", a low-attenuation ring in the bowel wall due to deposition of submucosal fat, is more common in ulcerative colitis than Crohn's disease and may also be noted in neoplasm's like adenocarcinoma and lymphoma. The radiological hallmark of active UC is the presence of colonic mural thickening and enhancement. Normal colonic wall diameter is in the range of 2–3 mm, whereas a mean wall thickness of 8 mm has been reported in UC patients with active disease. Barium study and CT are complimentary modalities in evaluation of ulcerartive colitis. Though CT has a limited role in the diagnosis of uncomplicated ulcerative colitis, has an important role in the differential diagnosis and it is an excellent modality in the diagnosis of complications associated with the disease. Imaging features reveal Symmetrical thickening of haustral folds may produce the appearance of thumb printing Fig. 5. When the entire colon is involved, changes in the terminal ileum may be seen (backwater ileitis); this involves 4-25 cm of the terminal ileum [7,8]. The CT hallmark of active UC is the presence of colonic mural thickening with white sign on contrast enhancement and grey sign on chronic IBD Fig. 6. CT features help narrow the differential diagnosis in terms of location of involvement, extent, appearance of colonic wall thickening, and type of complications - as ascites which is more often seen in infectious, ischemic, and pseudomembranous colitis.

Diverticulitis

Diverticulitis is a focal asymmetric process with fascial thickening and inflamed diverticula. Computed tomography (CT) has replaced contrast enema as the imaging procedure of choice for diverticulitis. CT may fail to demonstrate early, mild cases of diverticulitis. Coronal reformatted images may be helpful to show mild pericolonic fat stranding associated with horizontally oriented segments of colon [9]. The CT findings in complicated diverticulitis revealed presence of an abscess, and contained / free extra luminal air pockets Fig. 7. Ultrasound has also been successfully used for diagnosis, and magnetic resonance imaging (MRI) has significant potential as a radiation-free imaging test for acute colonic diverticulitis.

BEZOAR

A bezoar is the result of the ingestion of indigestible or poorly digestible substances that accumulate in the gastrointestinal tract in the form of a mass. It can result from any substance that is capable of forming concretions within the gastrointestinal tract. The classification of a bezoar is according to the foreign material that constitutes its core and includes - trichobezoar (hair), phytobezoar (fruits or vegetable fibers), lactobezoar (milk curd), lithobezoar (rock-like substances). The stomach is the most common site of bezoar formation, followed by the small intestine and, rarely, the colon or rectum [10]. Colonic bezoars may be associated with previous history of surgery or segmental aganglionosis as phytobezoar or fecaloma . small bowel bezoars are commonly associated with gastric bezoar commonly as trichobezoar in psychiatric patients. . CT is much more sensitive and specific than plain radiography, and described series had shown the focal concentric whorls of different densities with pockets of air within it as noted in our case (Fig. 8). CT enabled to determine the point of obstruction, and detect the existence of additional intestinal or gastric bezoars. The method of bezoar removal depends on the site of impaction, and size, nature, and complications such as stercoral ulcer, perforation and obstruction.

Colorectal Tumours

CT-scan and MRI are essential for proper staging. With MRI of the rectum and pelvis can be gained into the depth of penetration into the wall or surrounding adipose tissue, lymph nodes and perirectal fascia. CT-scan probably is more suitable to assess metastatic disease. Colorectal adenocarcinoma is one of the most prevalent malignancies and surgery is the curative option . In case of lymph node metastases, adjuvant chemotherapy is applied in order to increase the disease free survival and the five-year survival rate. These differences in therapeutic approach between colon cancer and rectal cancer. Pre-operative staging with CT-scan or MRI is used to differentiate between rectal cancer and cancer located in the sigmoid. Approximately 30% of colorectal cancers occur in the sigmoid, 25% occur in the rectum (Fig-9a), and 25% occur in the cecum and ascending colon**.** The remaining 20% of cancers occur in the transverse and descending colon (Fig. 9b)**.** Morphologically these tumors may be large necrotic (Fig. 10 a), and polypoid (Fig. 10b) or ulcerative, infiltrative lesions (Fig-10c) that afford a worse prognosis .More distal cancers tend to infiltrate and have an applecore appearance. Tumors of the right colon can grow very large before causing symptoms such as obstruction. Though striated wall thickening as " target sign" denoted benign conditions as inflammatory ,infective or ischemic etiology, scirrhous type of carcinoma colon rarely show such CT pattern (Fig. 11) showed abnormal striated wall thickening causing "Target sign" at the ascending colon with infiltrative lesion involving the ileocecal junction in 14 years old male patient. Complications associated with colon cancer include obstruction in 8% to 29%) (Fig. 12), perforation (occurs in 2.5-10%), with peritoneal spillage or as a localized perforation with an abscess or fistula formation, rarely as acute appendicitis, ischemic colitis and intussusceptions [11,12]. As bowel obstruction is the most commonly observed complication of colon cancer .Careful inspection of the cecum on the CT, and especially the

ileocecal valve area, is needed to diagnose this rare condition. CT is a sensitive imaging modality for detecting bowel obstruction, and the multiplanar reconstruction images can provide additional information on the transition point in problematic cases .Primary perforated colon carcinoma is the main consideration in the differential for findings of diverticulitis on CT, because it may present with eccentric or circumferential wall thickening, with features of inflammation and obstruction. The most common location for abscess formation is the peritoneal or pelvic cavity, the paracolic space and fistula or inflammation can spread along the tissue planes may lead to abscesses in distant locations (Fig. 13). Severe pericolic fat stranding adjacent to a thickened colon wall is the most significant CT finding for differentiating inflammatory diseases from colon cancer that is without perforation. Diverticulitis and neoplasm both may involve short segments of bowel; however, when a segment of greater than 10 cm is involved, is considered specific for diverticulitis. When the findings are equivocal for diverticulitis versus colon carcinoma, follow-up colonoscopy or imaging is suggested.

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Lymphoma

The GI tract is the most common extranodal location for non-Hodgkin's lymphoma (NHL) accounts for 20%.The primary sites of origin at stomach 50–70%, small bowel 20–35%, colon (especially the cecum) 5–10%, and esophagus <1%.Primary rectal lymphoma is an uncommon disorder accounting for 0.1% of all primary rectal tumours. There is a slight male predilection, typically occurring between the ages of 50 and 70 years. The common histological subtypes of nodal lymphomas arising in more than 90% of the cases are diffuse large B-cell and mucosa-associated lymphoid tissue (MALT). The lack of specific symptoms often leads to delays in diagnosis and advanced stage at presentation, detecting a bulky disease in more than 50% of patients [13, 14].

The imaging features of primary colorectal lymphoma are quite variable and overlap with other colonic pathology; however, the well noted features are of focal and diffuse forms. Focal lesions includes polypoid mass, circumferential infiltration with smooth mucosal surface, circumferential infiltration with extensive ulceration, cavitary mass, mucosal nodularity,and exophytic bulky mass [13]. Malignant lymphomas are the third most common type of childhood cancer. Children typically present with diffuse extranodal disease in contrast to adults among whom primary nodal disease is common. The peak age for NHL of GI tract in children is 5–15 years. Unlike adult patients in whom stomach is the most frequent site, small and large intestines are the most commonly involved sites in pediatric age group (Fig. 14a, b, c) [12]. Features that help suspect lymphoma include well-defined margins with preservation of fat planes, no invasion into adjacent structures and perforation with no desmoplastic reaction could be demonstrated on CT or MRI. Both CT and barium studies are accurate in detecting tumor masses, CT may suggest other features which can differentiate primary lymphoma from adenocarcinoma and for staging purposes. BE examination may be invaluable for detecting morphology, mucosal irregularity and ,ulcerations which could be missed on CT. MRI is used in local staging, usually has homogeneous intermediate signal intensity on T1-weighted MR images and homogeneous medium signal intensity on T2-weighted images. Mild to moderate enhancement is seen after the intravenous administration of contrast material both on CT and MRI (15 Fig. a, b).

Carcinoid tumors of the colon and rectum

Carcinoid and neuroendocrine tumors arise from the neuroendocrine cells, also referred to as clear cells or amine precursor uptake and decarboxylation (APUD) cells. Pure carcinoid tumors tend to be slow growing and have a relatively indolent course, whereas adenocarcinoid tumors are very aggressive and fast growing. Malignant carcinoid refers to the well-differentiated neuroendocrine carcinomas, where tumors invaded the muscularis propria or metastasized to regional lymph nodes or distant metastasis. Less than 10% of patients with carcinoid will develop the carcinoid syndrome, caused by the overproduction of serotonin, which can lead to symptoms of cutaneous flushing, diarrhea and broncho constriction. Imaging techniques available in the evaluation of NETS include CT, MRI, Octreoscan, and ^{99m}Tc-labeled bone scintigraphy. CT and MRI remain the most common initial modes of evaluation for NETs .Typical findings include the triad of a calcified mass, spiculation, and stranding suggesting localized fibrosis [15]. Up to 35 to 48% of all colorectal carcinoids occur in the cecum and ascending colon (Fig. 16) , which may reflect the tumors arising from the base of the appendix extending into the cecum followed by rectal carcinoids only 6% of all colonic carcinoids occurring in the transverse colon and 11% in the descending colon.

Carcino Sarcoma of the colon

Carcino -Sarcomas which may occur in various organs and anatomical locations, show biphasic high grade tumors , behave aggressively regardless of treatment . These tumors have been described under a variety of names e.g., "carcinosarcoma", "pseudosarcomatous carcinoma". Various hypothesis as independent neoplastic growths from multipotent stem cell, epithelial to mesenchymal conversion by epithelial-stromal reaction and the the combination of the two was reviewed in the literature. Carcinosarcoma rarely affects the gastrointestinal tract and only few cases are reported in the colon. The tumor may have an "apple core" appearance or present as a large polypoid lesion, simulating adenocarcinoma. In our case CT revealed ascites with right iliac fossa ill-defined mass causing smooth 5mm wall thickening of the cecum and

an exophytic component of 2x3cm showed good uniform enhancement, associated with lung metastasis (Fig. 17). CT findings were non specific and post surgical specimen revealed sarcomatoid carcinoma on immuno histochemistry involving the cecum and the distal ileum [16].

Serosal Disease

Conditions that cause serosal disease include metastases, endometriosis, and other inflammatory conditions in the peritoneal cavity. The most common pathway to rectal involvement is direct invasion caused by a tumor originating in the adjacent organs such as prostate, urinary bladder, uterus, or vagina or in the ischiorectal fossa[17]

Secondary Deposits

The Peritoneal clefts and areas of peritoneal reflection probably represent the most frequent site of serosal invasion by colorectal neoplasm's [17]. Pelvic peritoneal involvement is best assessed with MRI with findings ranging from pelvic sidewall peritoneal enhancement to variable size nodules involving the pelvic organs (Fig. 19 and Fig. 20).

Endometriosis

Bowel endometriosis affects between 4% and 37% of women with endometriosis. Transvaginal and MRI are the investigating modalities in suspected cases of endometriosis, can determine the depth of bowel wall infiltration and the extent of involvement. MRI has a low sensitivity (33%), and that can be detected with MRI are those contain blood products. Hence the signal varies according to the stages of the lesion as hemorrhagic, solid deposit or fibrosis respectively. Lesions can reveal rectal wall thickening, anterior displacement of the rectum, abnormal angulation and loss of fat plane between uterus and bowel [18]. Inflammatory response due to repeated hemorrhage can lead to adhesions, strictures and bowel obstructions (Fig. 18). MRI signal intensity is close to that of pelvic muscle on all sequences and sometimes containing high-signal-intensity foci on T1-weighted, T2-weighted, or fat-suppressed images.

Intussusception

Ileocolic intussusception due to an elongated intra luminal polypoid lesion with fat density in an adult presented with small bowel obstruction (Fig. 21). In adults, almost 90% of the cases of intussusception are secondary to carcinoma, polyp, Meckel diverticulum, colonic diverticulum, stricture or benign neoplasm [19].

Sigmoid volvulus

Is abnormal twisting of the sigmoid colon along its mesenteric axis that causes closed-loop obstruction and can lead to ischemia, perforation, and death. Cross-sectional images were examined for degree of sigmoid dilatation, the whirl sign, number of transition points in the sigmoid colon, two crossing sigmoid transition points projecting from a single location (spot sign) and apparent separation of the sigmoid walls by adjacent mesenteric fat secondary to incomplete twisting or folding (split-wall sign) (Fig. 22) [20]

Fig. 1a

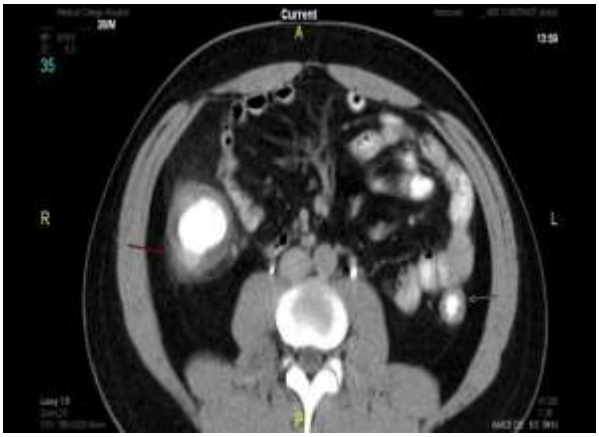

Fig. 1b **Fig. 1c**

Fig. 1a: 28-year-old febrile man with diarrhea and lower abdominal pain of 2 days duration. Contrast-enhanced CT scan showed pancolitis and, Fig. 1b: circumferential wall thickening, target sign with pericolic fat stranding at ascending and descending colon. Fig. 1c: Long segment right colonic wall thickening with pericolic strands due to subacute radiation enteritis in a follow up case of retroperitoneal liposarcoma with post radiation status..

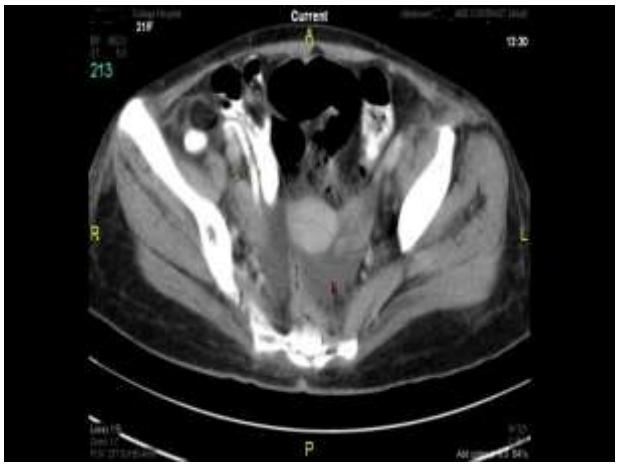

Fig. 2a **Fig. 2b**

Fig. 2a: case of tuberculous colitis , Barium study showed transverse (yellow arrow),circumferential (red arrow) ulcers, nodular inflammatory polyps (white arrow) due to thickened folds, involving the ascending and transverse colon with narrowed ileocecal region. Fig. 2b: Contrast enhanced CT well demonstrated the distal ileal loop stricture (yellow arrow) and ascites (red arrow)

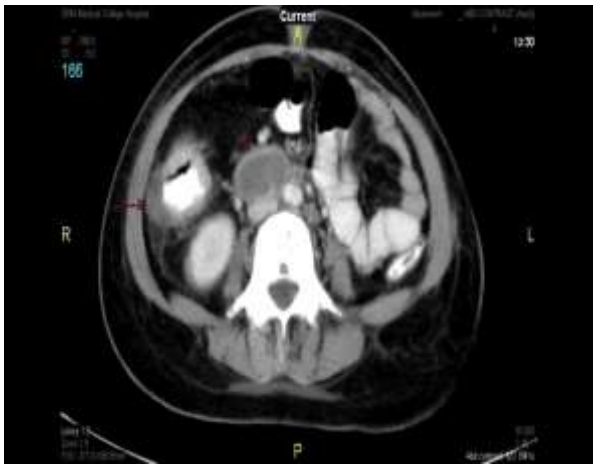

Fig. 3a **Fig. 3b**

Fig. 3a: CT scan revealed a concentric wall thickening of the cecum (long arrow), mesenteric folds and large necrotic mesenteric lymph node (short arrow). Fig. 3b: Right apical segment of lung shows broncho pneumonic lesion.

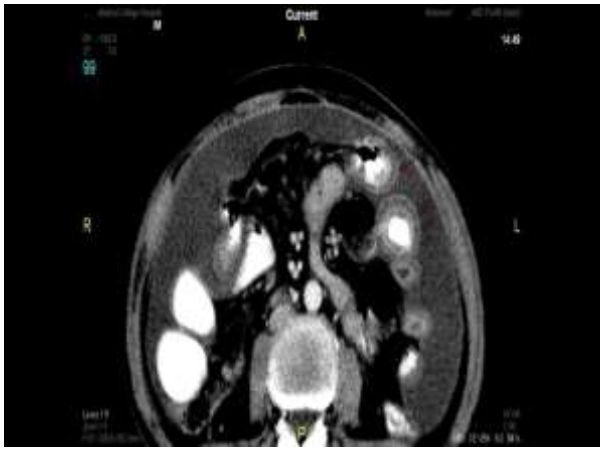

Fig. 4: CT showed stratified pattern of attenuation due to submucosal edema at splenic flexure (arrows) in acute bowel ischemia, associated with ascites and mesenteric edema.

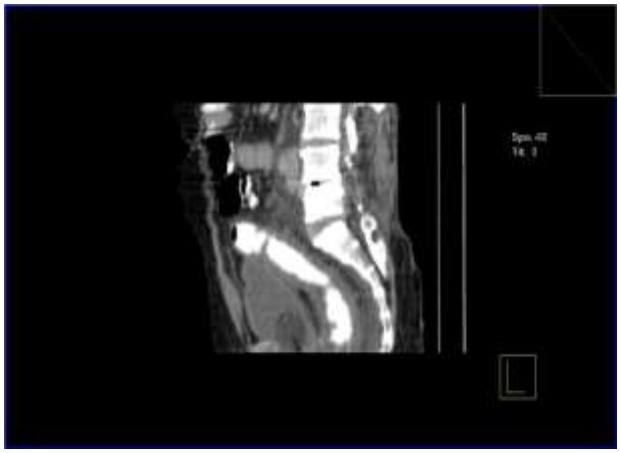

Fig. 5: Reconstructed CT image revealed circumferential symmetric thickening of haustral folds with the appearance of thumb printing in case of ulcerative colitis (UC).

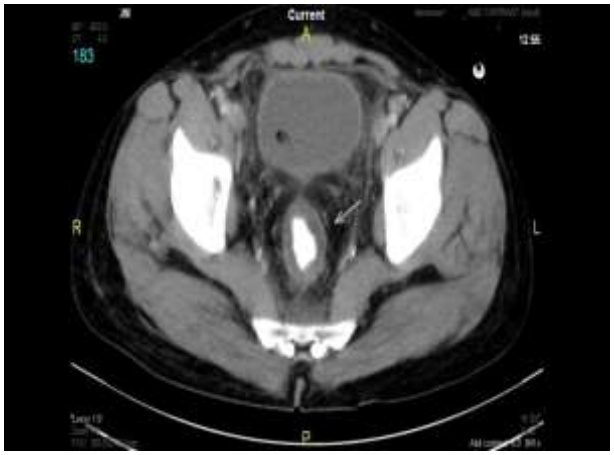

Fig. 6: The CT hallmark UC is the presence of colonic mural thickening with grey sign (arrow) on chronic IBD, with peri rectal inflammation.

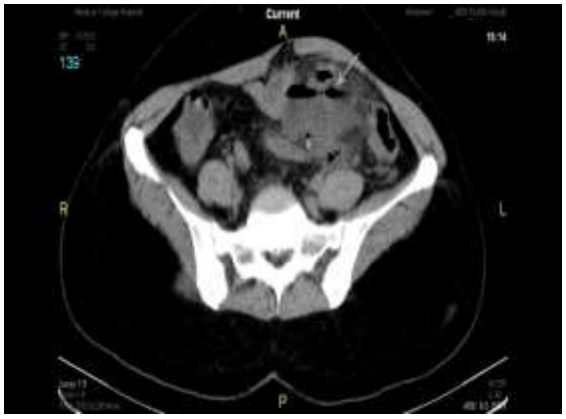

Fig. 7: The CT findings in complicated diverticulitis may include the presence of an abscess (long arrow), contained or free extraluminal air pockets (short arrow), with descending colon wall thickening

Fig. 8: Showed focal concentric whorls of different densities with pockets of air within in descending colon in a case of trichobezoar in a patient under psychiatric treatment.

Fig. 9a

Fig. 9b

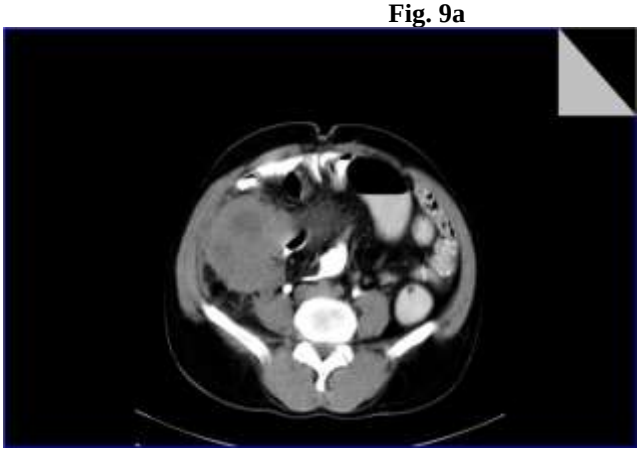

Fig. 9c

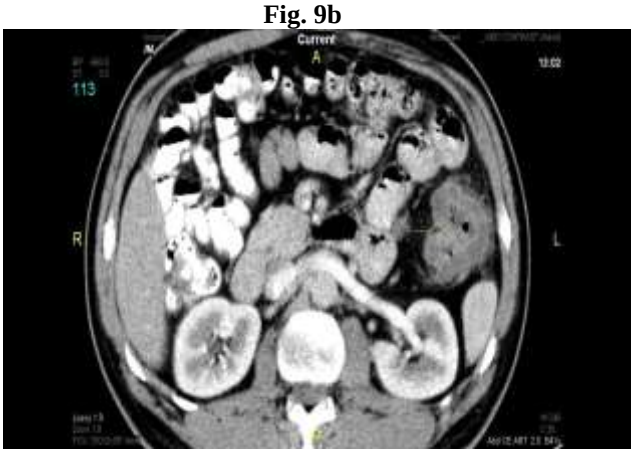

Fig. 9d

Fig. 9a: Rectal Adenocarcinoma(AC) with apple core deformity and (Fig. 9b) descending colon AC with pericolic stranding and minimal heterogenous contrast enhancement of circumferential wall thickening.

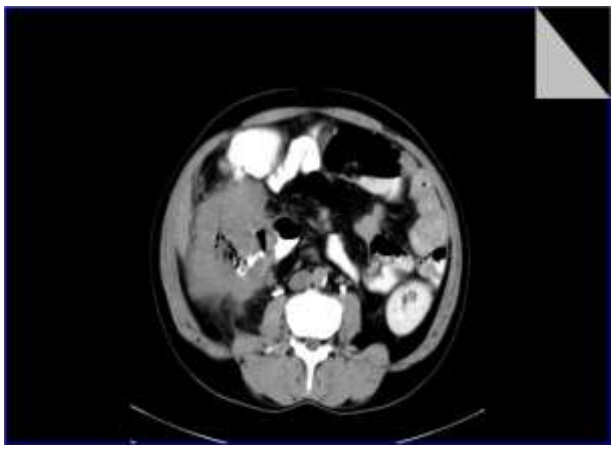

Fig. 10a

Fig. 10b

Fig. 10c

Fig. 10a Morphologically AC showed features as ulcero- proliferative growth in ascending colon and Fig. 10b: polypoidal pattern on axial contrast CT study at sigmoid colon. Fig 10c: Barium Enema study denoted the focal infiltrative AC involved cecum in 35 years old female presented with lung metastasis.

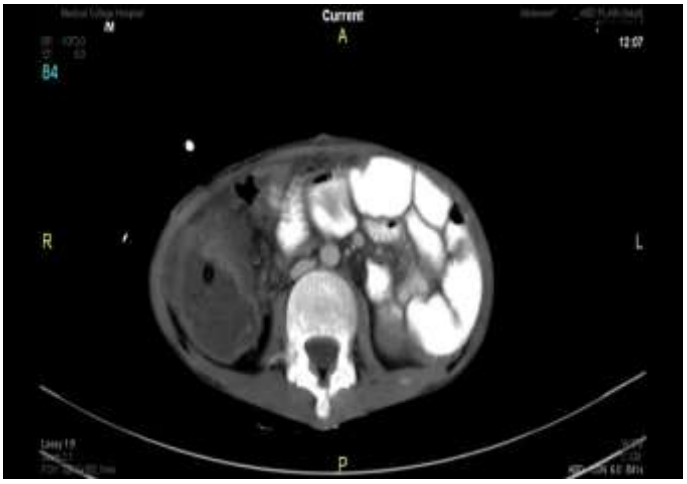

Fig. 11: Showed target sign in a case of scirrhous carcinoma at ascending colon with heterogenous significant enhancement of the irregular wall with contrast.

Fig. 12: 14yrs old male X-ray showed small bowel obstruction due to scirrhous carcinoma of ascending colon.

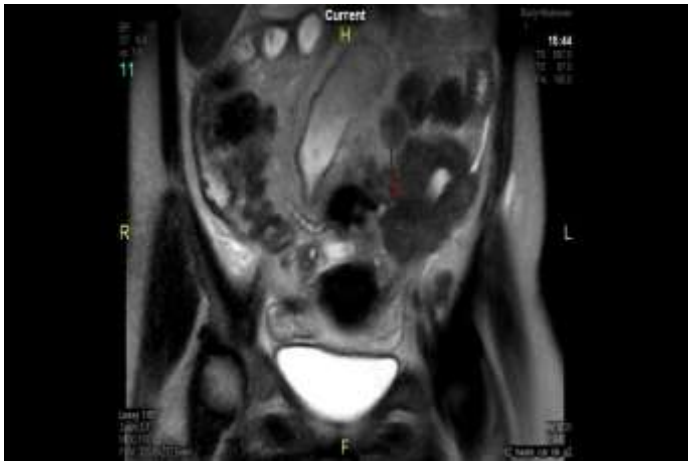

Fig.13: Rare case of perforated sigmoid colon adeno carcinoma presented with acute lower abdominal pain, CT post contrast revealed asymmetric circumferential wall thickening of sigmoid colon with adjacent air fluid level (arrow), extraluminal air pokets and extensive fat plane stranding.

Fig. 14a

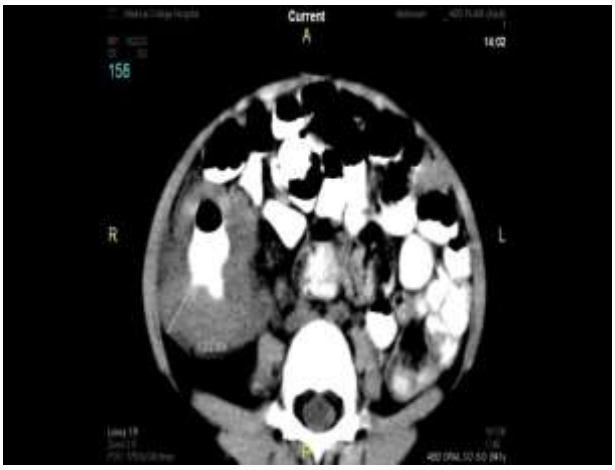

Fig. 14b

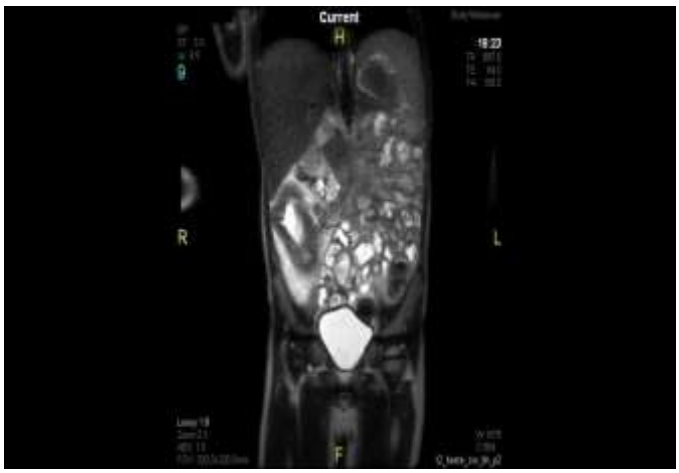

Fig. 14c

Fig. 14a: A case of cecal lymphoma(4yrs male) USG Showed pseudokidney sign with asymmetric bulky mass CT (14b) and MRI (14c) revealed long segment circumferential asymmetric thickening involving cecum and the ascending colon (arrow) and pericolic nodes

Fig. 15a **Fig. 15b**

Fig. 15a: 20yrs female with H/O constipation of 2weeks duration, CT showed ulcero proliferative bulky homogenous mild enhancing mass lesion involving the rectum with narrowed lumen (arrow) in a histologically proved case of rectal B cell Non Hodgkin's lymphoma. Fig. 15b: MRI coronal T2 image showed the rectal mass with differential layer signal denoting submucosal (long arrow) and perirectal lesion (red arrow) with narrowed rectal lumen (short arrow), located 5 cm from anus verge.

Fig. 16: Colorectal carcinoids occur in the cecum and ascending colon (arrow) which may reflect the tumors arising from the base of the appendix with desmoplastic reaction.

Fig. 17: Wall thickening of the cecum with small exophytic enhancing component with lung, omental metastasis and ascites in histologically proved case of Carcino sarcoma.

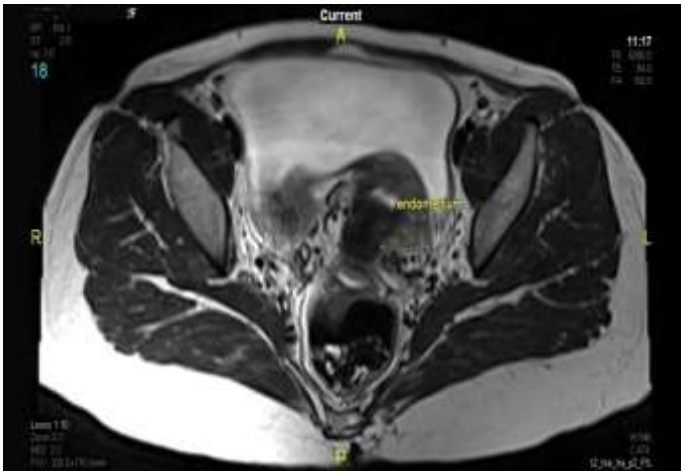

Fig. 18: Known case of endometriosis T2-weighted axial MRI image showed hypointense endometroid deposit at posterior wall of uterus (long arrow) and mixed signal sigmoid colon serosal deposit (short arrows).

Fig. 19: Carcinomatous deposit at rectal serosa (yellow arrow) on axial CT post contrast study of a known case of adenocarcinoma of ascending colon.

Fig. 20: 45 years old female patient with bladder carcinoid and rectal serosal deposit causing wall thickening noted on CT axial post contrast study

Fig. 21: CT scan demonstrated ileo colic intussusception as inhomogeneous target-shaped mass in the right lower abdomen with a lead point with fat density due to lipoma.

Fig. 22: Apparent separation of the sigmoid walls (yellow arrows) by adjacent mesenteric fat (red arrow) secondary to incomplete twisting in axial CT study due to sigmoid volvulus.

CONCLUSION

A wide spectrum of disease processes can involve the colo rectum. In our study series lesions of focal asymmetric wall thickening were malignant , target sign with wall enhancement noted in colitis and fat stranding was disproportionately more severe were noted in inflammatory conditions as noted in the literature [3-5, 9]. Thus cross sectional imaging aids for narrowing the differential diagnosis and appropriate management.

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