

# Intestinal Bowel Wall Thickening Analysis on MDCT: A Retrospective Study

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## Abstract

**Background:** The aim of this study was to determine the causes and establish the significance of bowel wall thickening on abdominal computed tomography. **Subjects and Methods:** Consecutive abdominal CT's between January 2019 and December 2019 with findings of duodenal, jejunal, ileal and colonic 'bowel wall thickening' on the formal report was reviewed retrospectively. The patients history, inpatient course & subsequent colonoscopy and /or operative findings were also reviewed. **Results:** Of the 88 consecutive CT abdomen's identified, infection (26.1%) and new cancer (22.7%) were the most common causes. Bowel obstruction (12.5%) and Inflammatory Bowel Disease (10.2%) were relatively uncommon causes. Overall 40/88 (45%) & 14/88 (15%) patients underwent subsequent colonoscopy and progressed directly to surgery respectively; of these 36/40 (90%) of the former and 14/14 (100%) of the latter showed findings similar to CT. **Conclusion:** When thickening of the bowel is detected with CT; pattern of the thickening, accompanying findings, history of the patient and clinical features must be evaluated together to reach prompt and correct diagnosis. All cases detected with bowel wall thickening on CT abdomen should warrant a subsequent colonoscopy.

**Keywords:** Bowel, Thickening, Wall, Computed Tomography, Colonoscopy

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## Introduction

Multidetector Computed Tomography (MDCT) has become the most widely used and important imaging modality for investigating the cause of abdominal symptoms.<sup>[1,2]</sup> It is used in the examination of patients presenting with acute abdominal complaints, known or suspected malignancy, abdominal and pelvic trauma & inflammatory conditions. During CT interpretation of the abdomen and pelvis, the general focus is placed on the peritoneal cavity, the mesentery and the parenchymal organs.<sup>[3,4]</sup> Bowel wall thickening is a common, non-specific finding on abdominal CT and is caused by a variety of underlying etiologies including inflammatory, infective, ischaemic and neoplastic.<sup>[2]</sup> It frequently leads to further invasive investigations including colonoscopy; however, the relevance of bowel wall thickening to the clinical presentation is many times not clear.<sup>[5-7]</sup> There have been only a handful of studies with regard to the final causes of incidental bowel wall thickening and its correlation with subsequent endoscopic findings. Recommendations from these studies

are conflicting, with many authors suggesting high rates of underlying pathology requiring colonoscopy, while others found benign or no pathology in the majority of patients and only recommended colonoscopy in high risk patients.

## Subjects and Methods

After obtaining approval from the internal ethical committee of Rajarajeswari Medical College and Hospital, Bangalore; consecutive abdominal contrast-enhanced CT's from January 2019 to December 2019 with findings of duodenal, jejunal, ileal and colonic bowel wall thickening on the formal report was reviewed. The various exclusion criteria involved were: associated wall thickening of stomach, associated wall thickening of anal canal and/or rectum, associated wall thickening of oesophagus. The equipment used was a Siemens Somatom Perspective 128 slice CT scanner. All the observations were recorded on a master sheet which included patient demographics, location of involvement, causes and subsequent interventions performed. Descriptive

and inferential statistical analysis was done using Microsoft Excel and SPSS software.

**Results**

A total of 88 cases were retrospectively studied which included 56 males (63.6%) and 32 females (36.3%) with a mean age of 44 years. The colon alone (25 cases, 28.4 %) was the most common site of involvement followed by the combination of ileum and caecum (18 cases, 20.4%). The involvement of caecum alone was the least common location of involvement (1 case, 1.1%).

**Table 1: Age distribution of cases**

Age (in years)	Number (n=88)	Percentage (%)
0-20	4	4.54
21-40	37	42.04
41-60	28	31.81
61.80	19	21.59
Mean ± SD	44 ± 16.25	

**Table 2: Location of involvement distribution in cases**

Location	Number (n=88)	Percentage (%)
Duodenum	03	3.4
Jejunum	10	11.3
Ileum	06	6.8
Caecum	01	1.1
Colon	25	28.4
Duodenum + Jejunum	02	2.2
Jejunum + Ileum	02	2.2
Ileum + Caecum	18	20.4
Ileum + Caecum + Colon	13	14.7
Caecum + Colon	06	6.8
Jejunum + Ileum + Caecum + Colon	02	2.2

**Discussion**

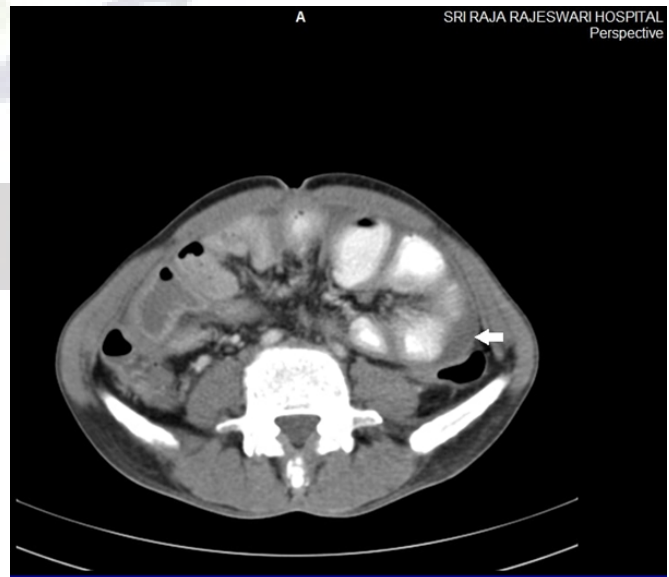
Normally the small bowel wall measures between 1 to 2 mm when the lumen is well distended, with slight variation depending on the degree of luminal distension. Some authors have used 2-3 mm as the upper limit measurement of normal wall thickness of the small bowel wall and 3mm as the upper limit for normal colonic wall thickness.<sup>[8-12]</sup> The reason for bowel

**Table 3: Distribution of causes in cases**

Cause	Number (N=88)	Percentage (%)
Infective	23	26.13
Reactive Inflammatory	08	09.09
Diverticulitis	08	09.09
Inflammatory Bowel Disease	08	09.09
Bowel Obstruction	10	11.36
Ischaemic Colitis	06	06.81
Malignancy	18	20.45

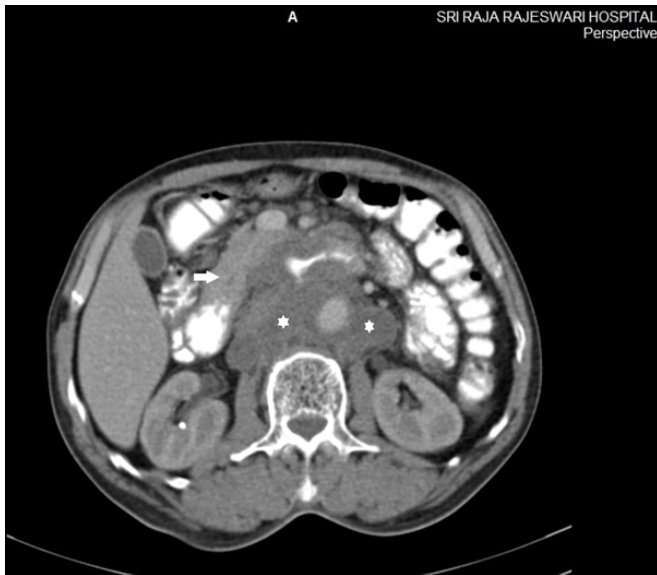
**Table 4: Distribution of subsequent interventions**

Subsequent Intervention	Number (N=88)	Percentage (%)
Colonoscopy	40	45.45
Progressed Directly To Surgery	14	15.91

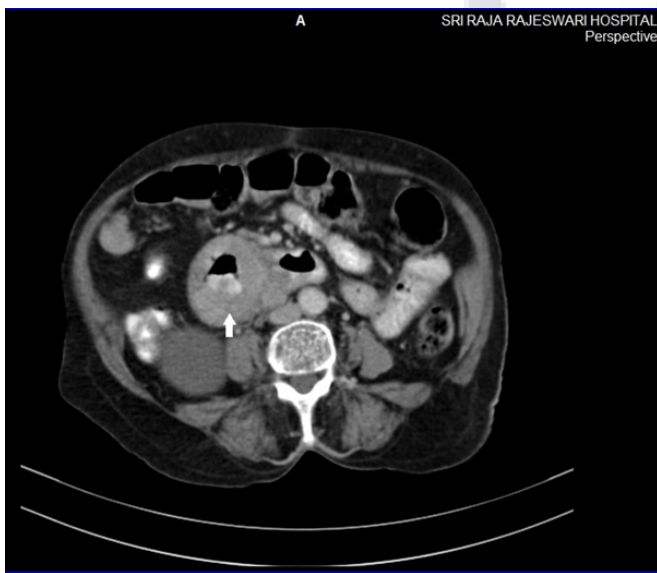


**Figure 1: Case of intestinal tuberculosis showing wall thickening of the descending colon ( ).**

wall thickening can be either submucosal edema, haemorrhage or neoplastic infiltration.<sup>[13,14]</sup> The CT findings that need to be assessed while evaluating a thickened bowel include: pattern of attenuation; degree of thickening; symmetric vs assy-



**Figure 2:** Case of small bowel lymphoma showing diffuse wall thickening of the jejunum ( ) and multiple enlarged paraaortic lymphnodes (\*).



**Figure 3:** Case of GIST showing marked asymmetric wall thickening of the duodenum ( ).

metric thickening; focal; segmental or diffuse involvement; and associated perienteric abnormalities. In addition to the above; mesenteric changes, patency of mesenteric vessels and luminal contents also need to be analysed.<sup>[13,15-17]</sup> The various differential diagnosis on MDCT for bowel wall thickening includes collapsed bowel; if thickening is due to sub-

mucosal edema as seen in conditions like Crohns, Ulcerative Colitis, Diverticulitis, Pseudomembranous colitis, Bowel ischaemia and radiation enteritis. Bowel wall thickening due to neoplastic infiltration is seen in conditions such as adenocarcinoma, lymphoma and Graft vs host disease. Other conditions such as angioedema, bowel trauma (submucosal haemorrhage), Henoch – Schonlein purpura, hypoproteinaemia can also present with bowel wall thickening.<sup>[13,15]</sup> A collapsed bowel can be differentiated from pathological bowel wall thickening by assessing other findings like mesenteric edema, vascular engorgement, lymphadenopathy and comparing nearby with distal bowel segments.

### Conclusion

When thickening of bowel is detected with CT: pattern of thickening, accompanying findings, history of the patient and clinical features must be evaluated together to reach a prompt and correct diagnosis. Bowel wall thickening detected on CT can be normal variants, inflammatory conditions and gastrointestinal neoplasms. Even though none of the solitary CT findings is by itself specific, the association of several abnormal parameters will lead to a correct diagnosis or will narrow the differential diagnosis in most cases. All cases detected with bowel wall thickening on CT abdomen should warrant a subsequent colonoscopy in contrary to earlier studies recommending colonoscopy only in high risk patients.

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