

TO STUDY THE CT CHARACTERISTICS OF WALL THICKENING IN CASE OF BENIGN AND MALIGNANT LESIONS OF THE COLON AND RECTUM.

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Abstract

Background & Method: This is a prospective study conducted in the Department of Radio Diagnosis, Shyam Shah Medical College, Rewa (M.P). In this study, patients with wall thickening involving the colon and rectum on CT were included. CT was performed using Iodohexol contrast medium. All patients were placed in the supine position on the CT table, and a rectal tube was inserted. Room air was gently insufflated into the colon get adequate colonic distension.

Result: There was involvement of the entire length of rectum in 30 % of the cases. Caecum, ascending colon, transverse colon, descending colon and sigmoid colon was involved in 20% of the cases. Rectum was the most common region to be involved (47.5%) followed by the sigmoid colon (27.5%). Four lesions showed involvement of both the sigmoid colon and the rectum (10%) and one lesion showed involvement of both the caecum and the ascending colon(2.5%).

Conclusion: MDCT is an excellent modality in the diagnosis and differentiation of benign and malignant lesions of the colon and rectum, since it has the advantage of providing thinner sections, faster acquisition and multi planar reformatted images.

Keywords: CT, Benign, Malignant & Rectum.

Introduction

Computed Tomography (CT) was invented by Sir Godfrey Newbold Hounsfield. Its introduction was a fundamental advance of the greatest importance to diagnostic medicine. It had a profound effect on radiology, liberating with the first step, the brain of both patient and doctor from the constraints of traditional imagery^[1]. It introduced the concepts of digital data acquisition, sophisticated the same time providing a stimulus and scientific environment for other major developments to follow, including Magnetic Resonance Imaging. CT provided, for the first time, quantitative information about tissue density differences in uniformly thin slices of tissue by employing collimated X-rays directed only at the layer under investigation^[2]. A density discrimination of 1:1000 could be achieved together with an increase of two orders of magnitude in data retrieval per unit of radiation dose. The distribution of this numerical information, now expressed as Hounsfield numbers, could be related to the ability of tissue to attenuate X-rays and by digital to analog conversion displayed as a grey level picture on a monitor. Most importantly, the picture so produced could be interrogated by the observer enabling the whole dynamic range of tissue to be explored^[3].

The attenuation pattern of a thickened segment of bowel wall is an important criteria for establishing a differential diagnosis. In most cases, the attenuation pattern of a thickened bowel wall is directly related to the administration of IV contrast material. If IV contrast material is not administered, most cases of bowel wall thickening will show homogeneous attenuation. Two

notable exceptions to this are the presence of central fat deposition and intestinal pneumatosis. In these cases, variations in attenuation of the bowel wall can be depicted on CT without IV contrast material because of the marked differences in tissue attenuation.

Material & Method

This is a prospective study conducted in the Department of Radio Diagnosis, Shyam Shah Medical College, Rewa (M.P). from April 2018 to March 2019. 100 patients with wall thickening involving the colon and the rectum on CT were included in the study.

In this study, patients with wall thickening involving the colon and rectum on CT were included. CT was performed using Iodohexol contrast medium. All patients were placed in the supine position on the CT table, and a rectal tube was inserted. Room air was gently insufflated into the colon get adequate colonic distension. CT acquisitions were performed in the arterial phase (start delay of 25-35 seconds) and in the portal venous phase (start delay of 50-70 seconds) with a section width of 5 mm. when wall thickening is identified, it is characterized using the following criteria.

Inclusion criteria:

1. All age groups and both sexes.
2. Patients with wall thickening involving the colon and rectum.
3. Patients in whom histopathological findings are available for correlation.

Exclusion criteria:

1. Patients with lesions involving the anal canal.
2. Patients in whom histopathological findings are not available for correlation.

Results**Table 1:** Presenting complaints of patients with benign disease

S. No.	Complaints	Frequency	Percentage
1	Abdominal pain	10	45.45
2	Vomiting	02	9.1
3	Loose stools	10	45.45
	Total	22	100

Loose stools (45.45%) and abdominal pain (45.45%) were the commonest symptoms in patients with inflammatory /infective disease of the colon.

Table 2: Sites of distribution in benign lesions.

S. No.	Lesion Location	Frequency	Percentage
1	Caecum+Ascending Colon	02	10
2	Caecum+Ascending Colon+Transverse Colon	02	10
3	Caecum+Ascending Colon+Transverse Colon+ Descending Colon + Sigmoid Colon	04	20
4	Ascending Colon	02	10
5	Ascending Colon+Transverse Colon	02	10
6	Transverse Colon+Descending Colon	02	10
7	Rectum	06	30
	Total	20	100

There was involvement of the entire length of rectum in 30 % of the cases. Caecum, ascending colon, transverse colon, descending colon and sigmoid colon was involved in 20% of the cases.

Table 3: Presenting complaints of patients with malignant lesions.

S. No.	Complaints	Frequency	Percentage
1	Abdominal pain	36	45
2	Bleeding per rectum	20	25
3	Constipation	14	17.5
4	Weight loss	08	10
5	Vomiting	02	2.5
	Total	80	100

In patients with malignant lesions of the colon the commonest presenting complaint was abdominal pain (45%) followed by bleeding per rectum(25%) and constipation(17.5%).

Table 4: Sites of distribution in malignant lesions

S. No.	Malignant Lesions Distribution	Frequency	Percentage
1	Caecum + Ascending Colon	02	2.5
2	Ascending Colon	06	7.5
3	Transverse Colon	02	2.5
4	Descending Colon	02	2.5
5	Sigmoid colon	22	27.5
6	Sigmoid Colon + Rectum	08	10
7	Rectum	38	47.5
	Total	80	100

Rectum was the most common region to be involved (47.5%) followed by the sigmoid colon (27.5%). Four lesions showed involvement of both the sigmoid colon and the rectum(10%) and one lesion showed involvement of both the caecum and the ascending colon(2.5%).

Discussion

Mild wall thickening had a sensitivity of 80%, specificity of 95%, positive predictive value of 80% and a negative predictive value- 95% in the diagnosis of benign lesions of the colon. Marked wall thickening had a sensitivity of 95%, specificity of 80%, positive predictive value of 95% and a negative predictive value of 80% in the diagnosis of malignant lesions. This is in agreement with the study done by Michael et al^[4] who described that mild wall thickening is a feature of inflammatory and infective lesions of colon and marked wall thickening is a feature of malignant lesions of colon such as adenocarcinoma.

Symmetric wall thickening had a sensitivity of 80%, specificity of 100%, positive predictive value of 100%, and a negative predictive value of 95.2%. This is in concordance with the study described symmetric wall thickening as a feature of benign intestinal lesion^[5].

Asymmetric wall thickening had a sensitivity of 100%, specificity of 80%, positive predictive value of 95.2% and a negative predictive value of 100%. Nina et al^[6] in their study have found that asymmetric wall thickening is a feature of malignancy which is similar to the pattern of thickening observed in our study.

Among the 39 lesions identified as malignancy on CT, histopathology confirmed malignancy in 40 cases. 1 case diagnosed as inflammatory on CT was confirmed as adenocarcinoma on histopathology^[7]. Hence in our study CT had a sensitivity of 97.5%, specificity of 90%, positive predictive value of 97.5% and a negative predictive value of 90% in the diagnosis of malignant lesions.

All the cases diagnosed as benign on CT were confirmed as benign on histopathology. 1 case diagnosed as benign on CT was confirmed as malignant on histopathology^[8]. Hence in our study CT had a sensitivity of 90%, specificity of 97.5%, positive predictive value of 90% and a negative

predictive value of 97.5% in the diagnosis of benign lesions. $K= 0.90$ (Excellent agreement). Hence CT is an excellent modality in differentiating benign and malignant lesions of the colon and rectum.

Conclusion

MDCT is an excellent modality in the diagnosis and differentiation of benign and malignant lesions of the colon and rectum, since it has the advantage of providing thinner sections, faster acquisition and multi planar reformatted images.

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