ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Original Research Article

Role of Multi detector computed Tomography in the evaluation of colorectal lesions with histopathological correlation

Dr. Khan Mohammad Faraz Mohammad Farid Khan[1] (Assistant Professor), Dr. Chandrasen Dayma[2] (Senior Resident), Dr. Priyal Chouhan[3] (Assistant Professor), Dr. Faiza Fareed Khan[4] (3rd Year Resident) & Dr. Fouzia Fareed Khan[5] (1st Year Resident)

Department Of Radio Diagnosis, Mahatma Gandhi Memorial Medical College, Indore, M.P.[1&3]
Department Of Radio Diagnosis, Index Medical College Hospital & Research Centre, Indore, M.P.[2]
Department Of OBGY, Mahatma Gandhi Mission Medical College And Hospital Aurangabad[4]
Department Of OBGY, Chirayu Medical College And Hospital, Bhopal[5]

Corresponding Author: Khan Mohammad Faraz Mohammad Farid Khan

Abstract:
Background & Method: The aim of present study is to study the role of Multi detector computed Tomography in the evaluation of colorectal lesions with histopathological correlation. In this study, patients with wall thickening involving the colon and rectum on CT were included. CT was performed using Idohexol 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.

Result: Of the 50 patients with colorectal lesions on CT, 40 lesions (80%) were diagnosed as malignant and 10 lesions (20%) were diagnosed as benign on histopathology. Of the 50 patients with colorectal lesions on CT, 40 lesions (80%) were diagnosed as malignant and 10 lesions (20%) were diagnosed as benign on histopathology.

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. MDCT is also useful in the staging of malignant lesions which helps in proper planning of surgery and further management of the patient.

Keywords: Multi detector computed Tomography, colorectal, lesions & histopathological.

Study Designed: A Cross sectional and correlative study.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

1. INTRODUCTION

Technological advances in CT have changed the practice of gastrointestinal radiology. With the development of high resolution scanners, technical refinements in obtaining better quality studies, and the accumulated clinical experience leading to better interpretation, the role, indications, and accuracy of CT of the gastrointestinal tract have dramatically enlarged and improved[1].

CT is an increasingly useful technique in the evaluation of intestinal disease, allowing the evaluation of bowel disease as well as extra-intestinal disease. CT also provides an excellent assessment of the peri-enteric abnormalities that frequently accompany bowel disease (adenopathy, ascites, fat stranding, presence of abscesses and fistulas) and improves specificity in diagnosis[2].

Conventional barium examinations remain superior to CT for evaluating intra- luminal and mucosal disease, but CT is far more accurate for evaluating the intramural and extra-intestinal components, including involvement of the mesentery, peritoneal cavity, retroperitoneum, and solid organs.

Thickening of the bowel wall is the commonly identified abnormality on CT in case of colorectal lesions[3]. The differential diagnosis for bowel wall thickening is wide. Once a bowel wall thickening is detected, its radiologic features are analyzed by using criteria specific to CT imaging. It is important to define the wall thickening as focal, segmental, or diffusely affecting an entire intestinal segment. CT features include degree of thickening of intestinal wall, symmetry of involvement, smooth versus irregular or lobulated inner or outer contour, and pattern of enhancement. Associated findings such as exophytic component, lymphadenopathy, distal metastases, adjacent mesenteric inflammatory response, phlegmon, or abscess are additional important features that are helpful in the differential diagnosis.

Michael et al[4] studied the CT characteristics of bowel wall thickening based on pattern of attenuation and enhancement; degree, symmetry, and extent of thickening; and associated abnormalities. They concluded that the association of several abnormal parameters will lead to a correct diagnosis or will narrow the differential diagnosis in most cases. When confusing or overlapping CT parameters are encountered or uncertainties persist, barium examinations should be liberally used as complementary diagnostic studies[5].

2. MATERIAL & METHOD

This is a prospective study conducted in the Department of Radio Diagnosis, Index medical college hospital and research centre. 50 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 Idohexol 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 CRITERTA:

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

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

EXCLUSION CRITERIA:

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

3. RESULTS

Table 1: Age distribution among cases

Below 30yrs	**3**	**6**
31- 40yrs	**7**	**14**
41 - 50yrs	**8**	**16**
51 - 60yrs	**10**	**20**
61 - 70yrs	**12**	**24**
Above 70yrs	**10**	**20**
Total	**50**	**100**

Most of the patients with colorectal lesions in our study were in the age group of 61-70 yrs(24%) followed by those above 70 yrs(20%) and those in the age group of 51-60 yrs(20%). Patients below 30 yrs were the least affected (6%)

Table 2: Histopathological diagnosis of lesions

Histopathological Diagnosis	**Number of cases**	**Percentage(%)**
Malignant	40	80
Benign	10	20
Total	50	100

Of the 50 patients with colorectal lesions on CT, 40 lesions (80%) were diagnosed as malignant and 10 lesions (20%) were diagnosed as benign on histopathology.

Table 3: Sites of distribution in benign lesions

Location of lesion	**Frequency**	**Percentage (%)**
Caecum+Ascending Colon	1	**10**
Caecum+Ascending Colon+Transverse Colon	1	**10**

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Caecum+ Ascending Colon +Transverse Colon+ Descending Colon + Sigmoid Colon	2	**20**
Ascending Colon	1	**10**
Ascending Colon+Transverse Colon	1	**10**
Transverse Colon+Descending Colon	1	**10**
Rectum	3	**30**
Total	**10**	**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 4: Presenting complaints of patients with malignant lesions.

Complains	**Frequency**	**Percentage(%)**
Abdominal pain	18	**45**
Bleeding per rectum	10	**25**
Constipation	7	**17.5**
Weight loss	4	**10**
Vomiting	1	**2.5**
Total	**40**	**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 5: Histopathological Staging of Malignant Lesions

STAGING OF MALIGNANT LESIONS	**FREQUENCY**	**PERCENTAGE (%)**
T1	13	32.5
T2	18	45
T3	9	22.5

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

Out of the 40 malignant cases, CT staged 14 cases as T1, while on histopathology; 13 cases were staged as T1, therefore; overstaging was done in 1 case in CT. Of the 18 cases staged as T2 on histopathology, CT correctly staged 16 cases as T2, therefore; Understaging was done in 2 cases in CT. All the 9 cases staged as T3 on histopathology were correctly staged on CT as T3.

4. DISCUSSION

This was a hospital based correlative study to describe the role of MDCT in the evaluation of colorectal lesions. In our study 50 patients with wall thickening involving the region of the colon and rectum were studied.

Out of these 50 patients, 30 were males and 20 were females. The age group commonly affected were those in the age group of 61-70 yrs (24%). These are in concordance with the study done by Rajesh et al[6]. They studied the pattern of colorectal lesions in 50 patients and found that males were more commonly affected (60%) and most of the patients were in the age group of 61-70 yrs (24%).

Among the 50 cases, 40 cases were histopathologically proved to be malignant and 10 cases were proved to be benign. Loose stools (45.45%) and abdominal pain (45.45%) were the commonest symptoms in patients with benign lesions of the colon[7]. Abdominal pain was the commonest symptom in patients with malignant lesions of the colon and rectum. Bleeding per rectum was the second most commonest symptom in these patients[8].

Most of the patients with benign lesions of the colon had contiguous involvement of the caecum, ascending colon, transverse colon, descending colon, sigmoid colon (20%) and the rectum (30%) Rectum was the commonest site for malignant lesions (47.5%)[9]. This is in agreement with the study done by Rajesh et al. In their study there was involvement of the rectum in 53.71% of the cases.

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. 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[10].

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. 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[11].

K= 0.90 (Excellent agreement). Hence CT is an excellent modality in differentiating benign and malignant lesions of the colon and rectum. Out of the 40 malignant cases, CT staged 14 cases as T1, while on histopathology; 13 cases were staged as T1, therefore; overstaging was done in 1 case in CT .This was due to inflammatory reaction at the edge of the tumour which produces a nodular margin. Filippone et al[12] in their study on staging of colorectal carcinoma using MDCT, were able to stage 93% of the lesions as T1 & T2 correctly. In our study 18 cases staged as T2 on histopathology, CT correctly staged 16 cases as T2, therefore; under staging was done in 2 cases in CT. Filippone et al were able to correctly stage 90% of the cases as T3 lesions. All the 9 cases staged as T3 on histopathology were correctly staged on CT as T3. Filippone et al were able to correctly stage 98% of the lesions as T4.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE2, 2023

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. MDCT is also useful in the staging of malignant lesions which helps in proper planning of surgery and further management of the patient.

In the majority of the benign cases, there was involvement of the entire rectum (30%). There was also contiguous involvement of the caecum, ascending colon, transverse colon, descending colon and sigmoid colon in 20% of cases.

6. REFERENCES

1. Balthazar EJ. CT of the Gastrointestinal Tract: Principles and interpretation. AJR 1991; 156.
2. Almeida MD, Jose J, Oneto J, Restrepo R. Bowel wall thickening in children. CT findings. Radiographics 2008; 28:727-746.
3. Rockey DC, Halvorsen RA jr, Higgins JL, Cello JP. Prospective evaluation of patients with bowel wall thickening. Am J Gastroentero1995;90(1):99-103
4. Macari M, Balthazar EJ. CT of bowel wall thickening, significance and pitfalls of interpretation. AJR 2001;176:1105-1116.
5. Mohandas KM. Colorectal cancer in india: controversies, enigma and primary prevention. Indian j gastroenterology 2011;30:3-6.
6. Laishram RS, Kaiho N, Shimray R, Devi SB, Punyabati P, Sharma DC. Histopathological evaluation of colorectal carcinomas status in Manipur, India. International Journal Of Pathology 2010;8:5-8.
7. Mohandas KM, Desai DC. Epidemiology of digestive tract cancers in India. Large and small bowel. Indian Journal of Gastroenterology 1999;18:118-121.
8. Kottler NE, Aguirre DA, Sirlin CB. CT evaluation of gastrointestinal tumours: Imaging techniques and key diagnostic findings. Applied Radiology 2005;34:7.
9. Pereira JM, Sirlin CB, Pinto PS, Jeffrey RB, Stella DL, Casola G. Disproportionate fat stranding: A heipful sign in patients with acute abdominal pain. Radiographics 2004;24:703-715.
10. Balthazar EJ, Megibow AJ, Hulnick D, Naidich DP. Carcinoma of the colon: Detection and preoperative staging by CT. AJR 1988;150:301-306.
11. Kumar K, Rowsell C, Ko YJ. Coexistence of gastrointestinal stromal tumour and colorectal adenocarcinoma: Two case reports. Journal of gastrointestinal oncology 2011;2:50-54.
12. Filippone A, Ambrosini R, Fuschi M, Marinelli T, Genovesi D, Bonomo L. Preoperative T and N staging of colorectal cancer: Accuracy of contrast enhanced Multi-Detector row CT colonography- Initial experience. Radiology 2004;231: 83-90.