

Original Research

Determination of 46 cases of mesenteric ischaemia with Multi-detector cone beam tomography

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ABSTRACT:

Introduction- The present study was conducted to determine the cases of mesenteric ischemia with Multi-detector cone beam tomography. **Materials & Methods:** 46 cases of mesenteric ischemia underwent MDCT examination after explaining the procedure to the patients using 128 detector rows Siemens definition AS scanner. **Results-** MDCT shows SMA dissection in 14 patients, bowel wall thickening in 31, bowel distention in 10 and pneumatosis in 5 cases. The difference was significant ($P<0.05$). 25 cases were acute and 21 were chronic. The difference was non-significant ($P<0.05$). **Conclusion-** Multi-detector CT is the most sensitive and specific diagnostic tool for AMI and should be used as the first-line imaging modality when AMI is suspected.

Key words- Mesenteric ischaemia, MDCT, AS scanner.

Received: October 24, 2020

Accepted: November 28, 2020

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This article may be cited as: Jena SK, Patnaik B, Kabiraj S, Jena P, Jena D. Determination of 46 cases of mesenteric ischaemia with Multi-detector cone beam tomography. J Adv Med Dent Scie Res 2020;8(12):127-129.

INTRODUCTION

Acute intestinal ischemia is an abdominal emergency occurring in nearly 1% of patients presenting with acute abdomen. The causes can be occlusive or non occlusive.¹ Early diagnosis is important to improve survival rates. In most cases of late or missed diagnosis, the mortality rate from intestinal infarction is very high, with a reported value ranging from 60% to 90%.²

Mesenteric ischemia can be chronic or acute at clinical manifestation. Chronic mesenteric ischemia is relatively rare and is considered imminent AMI, which is most commonly caused by atherosclerotic stenosis or occlusion of two or more major visceral arteries.³ Single arterial occlusion usually does not cause symptoms

because of rich mesenteric collaterals that develop during the slow progression of the disease. Typically, patients over 60 years of age (female predominant) present with characteristic symptoms that include postprandial abdominal pain (abdominal angina) and weight loss.⁴

Multi-detector cone beam tomography (MDCT) technology has dramatically improved the performance of CT scan which acquires rapid volumetric data over a large anatomic volume. This allows retrospective multiplanar reformatted images and CT angiograms with 2-D and 3-D visualization.⁵ These advantages are helpful in identifying the site, level and cause of bowel ischaemia by showing abnormal segments of bowel,

mesentery and vessels. In addition, other pathological conditions can also be detected in patients suspected of mesenteric ischaemia.⁶ The present study was conducted to assess the cases of mesenteric ischemia with Multi-detector cone beam tomography (MDCT).

MATERIALS & METHODS

The present study was conducted on 46 cases of mesenteric ischemia reported to the department of Radiodiagnosis of MKCG Medical College and Hospital, Brahmapur, Odisha, India OF both genders. All were informed regarding the study and written consent was taken. General information such as name, age, gender etc. was recorded. All patients underwent MDCT examination after explaining the procedure to

the patients using 128 detector rows Siemens definition AS scanner and the mesenteric arteries and their variation was determined. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

DISCUSSION

The mortality rate for AMI is as high as 50%–69%; this rate has gradually improved but has not changed remarkably during the past decade, despite progress in diagnostic and treatment options. The high mortality rate associated with AMI is largely due to the difficulty of early detection and subsequent delays in appropriate management.⁷

RESULTS

Table I Distribution of patients

Total- 46		
Gender	Males	Females
Number	26	20

Table I shows that out of 46 patients, males were 26 and females were 20.

Table II Nature of mesenteric ischemia

Nature	Number	P value
Acute	25	0.91
Chronic	21	

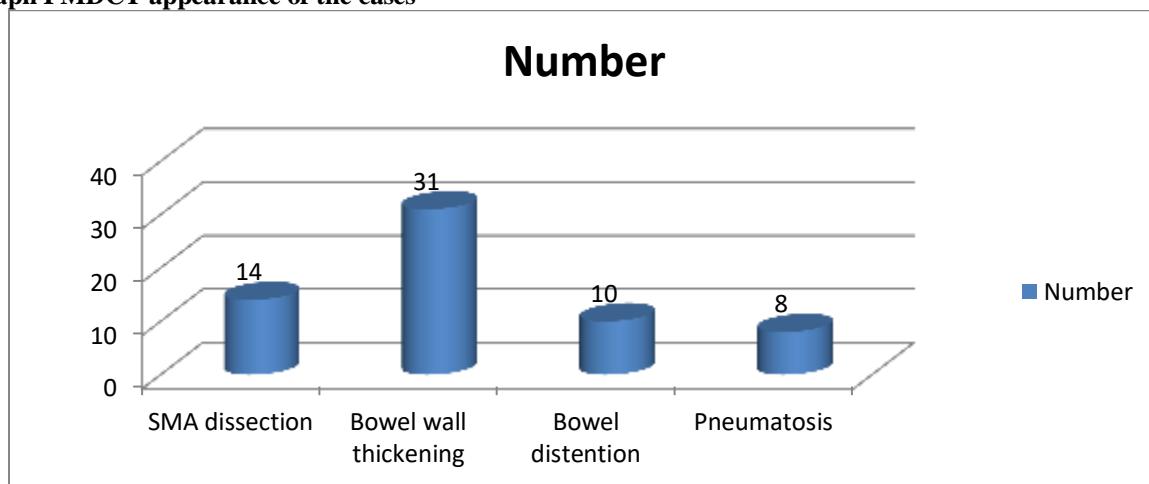
Table II shows that 25 cases were acute and 21 were chronic. The difference was non-significant ($P<0.05$).

Table III MDCT appearance of the cases

Appearance	Number	P value
SMA dissection	14	0.001
Bowel wall thickening	31	
Bowel distention	10	
Pneumatosis	8	

Table III, graph I shows that MDCT shows SMA dissection in 14 patients, bowel wall thickening in 31, bowel distention in 10 and pneumatosis in 5 cases. The difference was significant ($P<0.05$).

Graph I MDCT appearance of the cases



Generally, severe, constant, diffuse, or periumbilical abdominal pain out of proportion to the physical examination creates a high index of clinical suspicion for AMI. However, the symptoms are often nonspecific, and the initial manifestation mimics that of acute abdomen owing to other causes in 20%–25% of cases. In addition, there are currently no specific laboratory tests for early detection of AMI.^{8–10} The present study was conducted to assess the cases of mesenteric ischemia with MDCT.

In this study, out of 46 patients, males were 26 and females were 20. Shih et al¹¹ in their study found that the most prevalent CT findings were related to bowel wall, including thickening, distension and hyper-enhancement. Thickening of the bowel wall is the most frequent CT finding pertaining to AMI. This finding was observed in 7 of 9 patients diagnosed with acute mesenteric ischemia. Distension was found in 55% of the cases. The bowel wall can appear with low attenuation due to swelling and inflammation or with high attenuation due to bleeding in the submucosa.

We found that 25 cases were acute and 21 were chronic. The prognostic value of CT findings of intestinal ischemia has been already reported in the literature and can be explained by the correlation between the progression of intestinal ischemic damage and the corresponding alterations detected on imaging. Usually, outcome is closely correlated with the kind of vascular obstruction, with a reported mortality rate of 89% in the arterial and 11% in the venous forms.¹⁰ Multi-detector CT is the most sensitive and specific diagnostic tool for AMI and should be used as the first-line imaging modality when AMI is suspected. Findings at multi-detector CT can also help exclude other causes of acute abdominal pain. CT images should be obtained from the dome of the liver to the level of the perineum to cover the entire course of the intestine. Acquisition of both non-contrast material-enhanced and biphasic contrast-enhanced CT images is necessary. Therefore, routine abdominal imaging should be performed with multi-detector CT to obtain contrast-enhanced CT volume data in the arterial and venous phases, with dynamic injection of contrast material by a power injector after non-enhanced imaging is performed.¹¹

We observed that MDCT shows SMA dissection in 14 patients, bowel wall thickening in 31, bowel distention in 10 and pneumatosis in 5 cases. The prognosis for patients with AMI depends on the time to diagnosis and initiation of management. The mortality rate ranges from 0% to 10% with immediate management, increases to 50%–60% with a treatment delay of 6–12 hours, and increases further to 80%–100% with a delay of more than 24 hours after symptom onset. Therefore,

early diagnosis and prompt management are mandatory in patients with AMI.¹²

CONCLUSION

Authors found Multi-detector CT is the most sensitive and specific diagnostic tool for AMI and should be used as the first-line imaging modality when AMI is suspected.

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