VOLUME - 13, ISSUE - 04, APRIL - 2024 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Radio-Diagnosis

EVALUATION OF SMALL BOWEL OBSTRUCTION USING COMPUTED TOMOGRAPHY

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ABSTRACT While small bowel obstruction presents commonly, it's crucial to manage it effectively by accurately determining its site, level, and cause, and formulating a tentative prognosis prior to surgery. Diagnosis relies on a comprehensive approach involving clinical background, patient history, physical examination, and laboratory tests. Various radiologic procedures assist in diagnosis, with recent studies favoring CT scans due to their ability to precisely identify the site, level, and cause of obstruction, as well as detect signs of bowel inviability. CT scans are particularly valuable in characterizing obstruction from diverse causes such as adhesions, hernias, tumors, and malrotation. While conventional radiography has historically been the initial imaging method, CT scans have emerged as an important adjunctive tool, especially when addressing specific disease management concerns.

KEYWORDS :

INTRODUCTION:

Patients with abdominal pain are frequently admitted to the surgery department for emergent conditions, and small bowel obstruction is among the most common. It affects the small bowel in 60-80% of intestinal obstruction cases [2]. As some cases may resolve on their own, there is a growing inclination towards conservative management as the initial approach. Nevertheless, it's crucial to administer treatment diligently, aiming to ascertain the location, extent, and underlying cause of the obstruction, and even endeavoring to forecast the prognosis before considering surgery. An array of diagnostic radiologic techniques is at our disposal, spanning from conventional radiography and barium studies to computed tomography (CT)[3].

Historically, evaluation heavily relied on conventional radiography findings for many decades, boasting a sensitivity of 69% and a specificity of 57%[4].

Computed tomography (CT) has emerged as the preferred imaging modality for delineating the level, extent, cause, and potential complications of acute small bowel obstruction. Multidetector computed tomography (MDCT) offers superior resolution imaging, facilitating precise localization and characterization of lesions.

Numerous studies have underscored the value of CT in confirming the diagnosis, including identifying the site and level of obstruction, as well as revealing its underlying cause. CT exhibits an impressive sensitivity ranging from 94% to 100% and an accuracy between 90% and 95% in these diagnostic tasks[5,6].

AIMS & OBJECTIVES:

A)Evaluate the role of CT in diagnosis of small bowel obstruction and

B) To specify the accuracy of CT in revealing the

1)Site

2)Level

3)Cause

4)Extent of obstruction

5)To know the status of bowel viability and threatening signs if any.

MATERIALS & METHODS:

Study Design And Palce Of Study:

A prospective study was carried out in Department of Radio-diagnosis GEMS and Hospital, Ragolu, Srikakulam.

Study Subjects:

20 subjects who were admitted with either suspicion or clinically diagnosis small bowel obstruction.

Period Of Study: 2 years.

Age Group: 10-50 years

Methodology:

A detailed history was taken with correlative clinical examination. All patients were first evaluated with plain film(erect and supine) examination followed by CT evaluation(On GE 16 slice MDCT with collimation of 40x0.625mm, slice thickness of 100mm/sec and 16 slices per rotation) The study was done with oral contrast and intravenous contrast agents wherever required.

All the scans were performed on GE 16 slice MDCT with collimation of 40x0.625mm, slice thickness of 100mm and 16 slices per rotation. The scans were performed in **cranio-caudal direction with single breath hold.** After obtaining a digital scout view, unenhanced scan(NCCT) was done. Oral contrast was administered wherever necessary.

Oral contrast was avoided if

- Bowel was sufficiently distended proximally or
- Cases where immediate surgery was indicated

Rectal contrast was given if associated large bowel pathology was also suspected. IV contrast – injection omnipaque 350mg/ml was injected using CT pressure injector after administering test dose. Thin 100mm slices were obtained to study axial, coronal, saggital reformatted images in workstation.

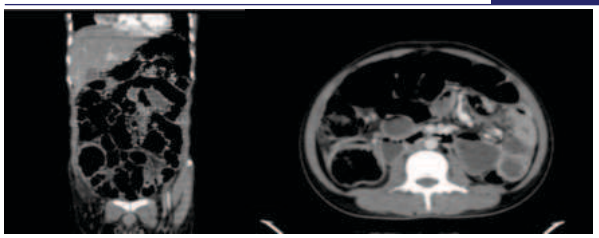
Inclusion Criteria:

- Clinically suspected patients with small bowel obstruction.
- Previous imaging studies/ records which favour/confirmed intestinal obstruction.

Exclusion Criteria:

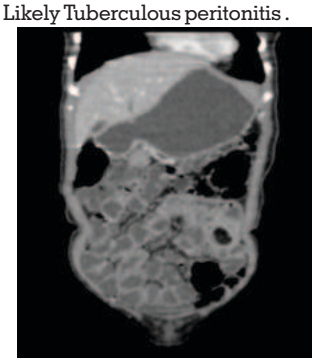
- Patients who have been diagnosed with other causes of acute abdomen.

Imaging Findings



Coronal and axial CT showing features of small intestinal obstruction proximal to long segment bowel wall thickening.

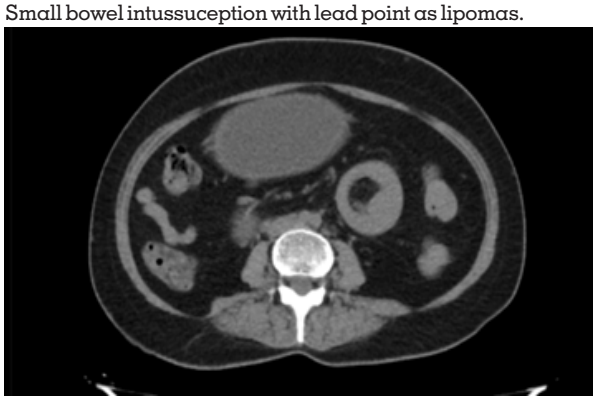
Axial sections showing edematous small bowel loops and with increased wall enhancement. Omental and peritoneal thickening with enhancement with enlarged mesenteric lymphnodes - Likely Tuberculous peritonitis .



Multiple hypodense lesions with fat attenuation and about 10 - 22 mm noted in small bowel loops in left hypochondrium.

Bowel in bowel configuration(Target sign) of small bowel as length of 8.5cm noted in left lumbar region along with mesentery and vessels

Small bowel intussuception with lead point as lipomas.



Bowel within the bowel configuration of jejuno jejunal loops (Target sign) of size 5.2x4.4 cm noted with mesentery and mesentric vessels within it in the left lumbar region - Jejuno jejunal intussuception with proximal small bowel obstruction.

RESULTS

In present study of 20 patients,

Sex Distribution –

11 cases - males(55%).
9 cases - females(45%).

Bowel Involvement –

- proximal small bowel involvement - 12 patients (60%),
- distal small bowel involvement- 8 patients (40%).

Extent Of Involvement –

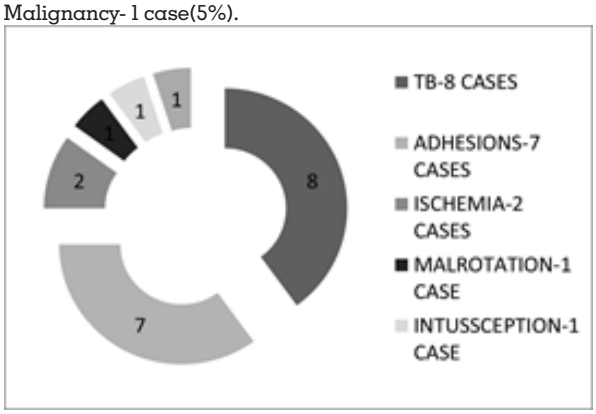
- complete involvement in 10 patients (50%),
- incomplete involvement- 10 patients (50%).

Extent Of Dilatation Showed:

3 to 4 cms in 10 pts (50%),
4-5cms in 8 pts (40%),
5-6cms in 2 pts (10%).

Cause Of Obstruction-

TB- 8 cases(40%),
Postoperative adhesions- 7 cases(35%),
Ischemia- 2 cases(10%),
Malrotation- 1 case(5%),
Intussception- 1 case(5%),
Malignancy- 1 case(5%).



The above findings are in conjuction with most studies by other authors regarding small bowel obstruction and its features.

DISCUSSION

Diagnosing small bowel obstruction relies on a comprehensive approach encompassing clinical background, patient history, and findings from physical examination and laboratory tests. While conventional radiography has traditionally served as the initial imaging method for patients suspected [7]. CT scans are crucial for identifying the location, extent, underlying cause, and seriousness of small intestine blockages, adding significant value as a diagnostic resource, especially in situations where precise disease management strategies are necessary[8].

MDCT, equipped with multi-planar and three-dimensional capabilities, demonstrated remarkable accuracy and specificity in identifying instances of intestinal obstruction[9,10].

In the majority of cases, MDCT can accurately illustrate the site, level, cause, extent of obstruction, and the viability of the bowel. Furthermore, MDCT has the potential to reveal various associated and incidental findings that may be challenging to detect through clinical examination alone[10].

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