

Original article:

Role of CT Scan in evaluation and management of Intestinal Obstruction

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Abstract:

The most important risk factor for mechanical small bowel obstruction is prior abdominal surgery causing postoperative adhesions usually. Patients with a history of prior abdominal or pelvic surgery, and particularly colorectal surgery, appendectomy, gynecologic surgery, prior adhesiolysis, and resection of malignancy are prone to adhesive small bowel obstruction. The risk of early postoperative bowel obstruction due to adhesions, which is defined as bowel obstruction occurring during the same hospitalization as the index operation, is increased after exploration for trauma.

INTRODUCTION:

The most important risk factor for mechanical small bowel obstruction is prior abdominal surgery causing postoperative adhesions usually. ¹⁻³Patients with a history of prior abdominal or pelvic surgery, and particularly colorectal surgery, appendectomy, gynecologic surgery, prior adhesiolysis, and resection of malignancy are prone to adhesive small bowel obstruction ⁴⁻⁶.The risk of early postoperative bowel obstruction due to adhesions, which is defined as bowel obstruction occurring during the same hospitalization as the index operation, is increased after exploration for trauma. ⁷⁻⁸.

The first imaging procedure used in patients with bowel obstruction is conventional radiography with 46–80% accuracy. Its accuracy in diagnosing the site and causes of obstruction and the presence of strangulation is even lower. The next step in patients with indeterminate radiographic findings is radiography with intraluminal injection of contrast material. ⁹⁻¹³

The role of computed tomography (CT) in the diagnosis of bowel obstruction has recently expanded. CT is recommended when clinical and initial radiographic findings remain indeterminate or strangulation is suspected. It clearly demonstrates pathologic processes involving the bowel wall as well as the mesentery, mesenteric vessels and peritoneal cavity. CT should be performed with intravenous injection of contrast material, and use of thin sections is recommended to evaluate a particular region of interest. The new technology that is of increasing interest in the diagnosis of small bowel obstruction is multiplanar reformatted imaging at a workstation. Axial, sagittal, coronal, and curved multiplanar reformatted images are created at a workstation from the acquired volume data. Multiplanar views may help identify the site, level, and cause of obstruction when axial findings are indeterminate¹³.

The diagnosis of small bowel obstruction is based on a comprehensive approach that includes clinical background, patient history, and results of physical examination and laboratory tests. Small bowel obstruction is a common occurrence that should be treated properly through identification of the site, level and cause of obstruction

accurately. A variety of radiologic procedures are available to aid in the diagnosis of small bowel obstruction. Recent studies have demonstrated the superiority of CT in revealing the site, level and cause of obstruction and in demonstrating threatening signs of bowel inviability.

Aim and Objectives: To evaluate the efficacy of computed tomography (CT) imaging in diagnosing the presence, level, degree and cause of intestinal obstruction

METHODOLOGY:

Present study was Prospective comparative conducted at Department of Surgery, DB Hospital Churu from Jan, 16-Dec, 16 (12 months). Study population was 100 Patients presenting to Department of Surgery, whether in OPD or Emergency, with complaints suggestive of Intestinal Obstruction, included in study through consecutive sampling, giving informed consent. A Pre-tested pre-structured questionnaire was used. After preliminary hematological and radiological investigation viz (complete hemogram, random blood sugar, blood urea, serum electrolytes, x-ray chest and abdomen, ultrasound abdomen), patients were subjected to CT scan of abdomen. In this study, multislice (64 slice) CT scanner was used. Patients were diagnosed conventionally by USG/ X-Ray abdomen and the findings were matched with per op and CT findings. The information thus collected was entered into Microsoft Excel sheet. Thereafter the data were analyzed with the help of SPSS 22.0 software.

RESULTS:

Age groups	No.	%
<20	0	0
21-40	24	24
41-60	56	56
>60	20	20
Sex		
Male	62	62
Female	38	38
Symptoms		
Pain abdomen	94	94
Vomiting	62	62
Abdominal distension	68	68
Constipation	32	32
Tachycardia	36	36
Abdominal tenderness	58	58
Guarding	68	68
Diagnosis		
Acute Intestinal Obstruction	10	10
Sub acute Intestinal Obstruction	76	76

Lump Abdomen	4	4
Pain Abdomen	4	4
Ileocaecal TB	2	2
CT findings		
Acute intestinal obstruction	2	2
Dilated bowel loops	36	36
Constriction/bands	18	18
Sub acute intestinal obstruction	17	17
Malignancy	8	8
Intussusception	10	10
Perforation	5	5
Enlarged lymph nodes	6	6
Total	100	100.0

Table-1 shows that majority (56.0%) of study population belonged to 41-60 years age group followed by 24% patients in >60 years age group and 20% in 21-40 years age group. Mean age of participants was 51.62±17.46 years. In our study 46% were males whereas 54% study participants were females. The most common symptom was pain abdomen (94%) followed by equal proportion of participants presenting with abdominal distension and guarding (68% each), 62% cases presenting with vomiting, 58% presenting with abdominal tenderness. Minimum 32% patients had presented with constipation. out of 50 patients 76% were diagnosed as Sub acute intestinal obstruction.

Table-2: Evaluation of Sensitivity and Specificity of CT as Diagnostic tool

CT	Operative	Conservative	Total
Positive	44	10	54
Negative	16	30	46
Total	60	40	50

Table 2 shows Sensitivity of CT = 73.33%, Specificity of CT= 75%, Positive predictive value of CT for its ability to detect Intestinal Obstruction = 81.5%, Negative predictive value of CT = 65.21%

DISCUSSION:

Majority (56.0%) of study population belonged to 41-60 years age group followed by 24% patients in >60 years age group and 22% in 21-40 years age group. <20 years age group had minimum number of participants. In our study 46% were males whereas 54% study participants were females. 76% were diagnosed as sub acute intestinal obstruction.

In present study, 60% patients were treated by surgery. 40% patients were treated by conservative management. Donckier V et al (1998)¹⁴ conducted a study on 54 Patients with suspected adhesive small bowel obstruction had CT at admission. CT demonstrated signs of strangulation or volvulus in 19 patients, including three with signs of peritoneal irritation. Association between MDCT findings suggestive of obstruction and intra-operative findings turn out to be significant (P=0.003). MDCT findings were consistent with intraoperative findings in 22 out of 30 patients (73%). MDCT is sensitive and specific in determining the presence of bowel obstruction and should be recommended for patients with suspected bowel obstruction because it affects outcome in these patients. The route of contrast used for CT. In 50% patients IV route was used, whereas in 18% patients both IV+Oral route was used. Mayen M. Achiek et al (2016)¹⁵ found common factor was that both sets of patients were admitted through accident and emergency with acute abdominal pain and provisionally being diagnosed on clinical assessment with bowel obstruction small /large bowel (SBO/LBO) to be confirmed by plain abdominal X-ray (AXR) as the next best investigation. Both sets of patients had plain abdominal Xray and it confirmed bowel obstruction (BO) in 75.23%.The subset KCH patients had abdominal computerized tomography (CT) scan after AXR, which did confirm bowel obstruction and staged it in patients who had AXR showing bowel obstruction.

CONCLUSION:

Imaging factors to help stratify patients into conservative or surgical treatment. Imaging is often an important factor assisting in the decision-making process since traditional clinical signs of vascular compromise, such as acidosis, fever, leukocytosis, and tachycardia are often unreliable in predicting the need for operative intervention. Thus, it is critically important for radiologists to identify imaging features that suggest or indicated high likelihood of bowel vascular compromise in order to help optimize management prior to the development of bowel ischemia and eventually necrosis.

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