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ORIGINAL ARTICLE

DIAGNOSIS AND MANAGEMENT OF SUBACUTE INTESTINAL OBSTRUCTION: A PROSPECTIVE STUDY

Amit Ojha[1], Anjani Jalaj[2], Shaleen Tiwari[3], Vikram Mujalde[4], Prasheel[5]

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ABSTRACT: Intestinal obstruction can be defined as impairment to the abnormal passage of intestinal contents that may be due to either mechanical obstruction or failure of normal intestinal motility in the absence of an obstructing lesion. Intestinal obstruction is the most common surgical disorder of the small intestine. SAIO implies incomplete obstruction. It has been defined in a number of ways and there are many gray zones in the treatment protocols. It is characterized by continued passage of flatus and/or feces beyond 6-12 hrs. after onset of symptoms namely colicky abdominal pain, vomiting, and abdominal distension. The study was taken by considering the following aims and objectives: To study the clinical profile and clinical features of patients presenting with subacute intestinal obstruction (SAIO). To study the role of investigations in diagnosis of SAIO. To find out the underlying cause of SAIO in patients under study. To study the predictors of relief of symptoms in patients with SAIO. To study the indications and timing for surgery for SAIO. To follow-up the progress of patients and find out the outcome of management. This study included 63 patients who presented with clinical features of sub-acute intestinal obstruction in Surgery Out-Patient Department or Emergency. The mean age of patients included was 31.8 years (SD±16.6, ranged 4 to 72 years). The male to female was 1.5:1.0. The duration of symptoms ranged from 1 day to 365 days (median - 4 days). Thirty out of 63 patients had recurrent symptoms, with a median of 2 episodes per patient with range from 1 to 13 episodes. Colicky abdominal pain (89%) and vomiting (82%) were more frequent as compared to non- passage of feces /or flatus (46%) and distension of abdomen (44%). Eight patients (13%) had earlier received anti-tuberculosis treatment for abdominal disease. A total of 20 patients (31.7%) had history of previous abdominal surgery. On physical examination, the most frequent finding was presence of exaggerated bowel sounds in 60.3% of patients. Distension abdomen was observed only in one-fourth of the patients. Seven patients had no abnormal physical finding. Five patients had abdominal tenderness and 4 out of these needed surgery to relieve obstruction. On plain x-ray films, 47 patients (74.6%) had multiple air-fluid levels on erect films. Ultrasonography was undertaken in 60 patients. It showed abnormal findings in 48 patients while it was reported normal in 12 patients. Dilated bowel loops were the most frequent finding. CT scan was performed in 15 patients. The abnormal findings noted in 14 patients and it showed the cause of obstruction in 10 patients. Diagnostic laparoscopy delineated the cause of obstruction in all the 5 patients in whom it was undertaken. In 18 patients in whom special investigations were available for comparison with operative findings, ultrasound was able to point out the cause of obstruction correctly in 3 patients (17%). CT scan demonstrated the etiology correctly in 9/10 patients. Diagnostic laparoscopy was performed in 5 patients and showed correct cause of obstruction in all patients. Out of total 63 patients, surgery was needed to relieve obstruction in 30 patients. Out of remaining 33 patients who got relieved by conservative management, investigations revealed lesions

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requiring elective surgery in 14 patients. Thus surgical treatment was done in a total of 44 (69.8%) patients.

KEYWORDS: Sab Acute Intestinal Obstruction (SAIO).

INTRODUCTION: Intestinal obstruction can be defined as impairment to the abnormal passage of intestinal contents that may be due to either mechanical obstruction or failure of normal intestinal motility in the absence of an obstructing lesion.[1] Intestinal obstruction is the most common surgical disorder of the small intestine.[2, 3]

It is one of the important causes of morbidity and mortality in the surgical practice. Though the knowledge of intestinal obstructions dates back to antiquity, it still remains a global surgical problem.[4] The diagnosis of intestinal obstruction is generally straight forward, but at times it poses a difficult problem. The latter is true in patients presenting as sub-acute intestinal obstruction (SAIO) with atypical features that cause delay in diagnosis.

SAIO implies incomplete obstruction.[5] It has been defined in a number of ways and there are many gray zones in the treatment protocols. It is characterized by continued passage of flatus and/or feces beyond 6-12 hrs. after onset of symptoms namely colicky abdominal pain, vomiting, and abdominal distension.[3] It is a confusing term usually applied to recurrent and intermittent intestinal obstruction.[6] It may develop as acute obstruction and get relieved within few hours spontaneously or after conservative management.

The episodes are recurrent, the patient being well in between. Intermittent nature of symptoms and signs delays diagnosis as well as definitive treatment. The patients often suffer for weeks and months before appropriate treatment is instituted. The intestinal obstruction can be of small intestine or large intestine.

The description of patients presenting with small bowel obstruction dates back to the 3rd or 4th century, when Praxagoras created an enterocutaneous fistula to relieve a bowel obstruction. Despite this success with operative therapy, the nonoperative management of these patients with attempted reduction of hernias, laxatives, ingestion of heavy metals (e.g., lead or mercury), and leeches to remove toxic agents from the blood was the rule until the late 1800s, when antisepsis and aseptic surgical techniques made operative intervention safer and more acceptable.

A better understanding of the pathophysiology of bowel obstruction and the use of isotonic fluid resuscitation, intestinal tube decompression, and antibiotics have greatly reduced the mortality rate for patients with mechanical bowel obstruction. However, patients with a bowel obstruction still represent some of the most difficult and vexing problems that surgeons face with regard to the correct diagnosis, the optimal timing of therapy, and the appropriate treatment. Ultimate clinical decisions regarding the management of these patients dictates a thorough history and workup and a heightened awareness of potential complications.

The causes of a small bowel obstruction can be divided into three categories:

1. Obstruction arising from extraluminal causes such as adhesions, hernias, carcinomas, and abscesses.
2. Obstruction intrinsic to the bowel wall (e.g., primary tumors).
3. Intraluminal obturator obstruction (e.g., gallstones, enteroliths, foreign bodies, and bezoars).

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Large bowel obstruction can be classified as dynamic (mechanical) or adynamic (pseudo-obstruction). Mechanical obstruction is characterized by blockage of the large bowel (luminal, mural, or extramural), resulting in increased intestinal contractility as a physiologic response to relieve the obstruction.

Judicious use of special Investigations has a definite rote in the management of SAIO. CT scan has been reported to facilitate diagnosis of early intestine obstruction and identification of strangulation. Colonoscopy is useful in detecting large bowel diseases. Laparoscopy has proven very helpful in atypical cases of intestinal obstruction in which the diagnosis is unclear even after modern advanced studies, like small bowel contrast study and CT scan.[7,8] Diagnostic laparoscopy is an upcoming modality for diagnosing obstruction and can even be therapeutic in selected patients. Exact role of these investigation in management of SAIO need further elucidation.

Colorectal cancer is the single most common cause of large intestinal obstruction in the United States, whereas colonic volvulus is the more common cause in Russia, Eastern Europe, and Africa. About 2% to 5% of patients with colorectal cancer in the United States present with complete obstruction. Intraluminal causes of colorectal obstruction include fecal impaction, inspissated barium, and foreign bodies. Intramural causes, in addition to carcinoma, include inflammation (diverticulitis, Crohn's disease, lymphogranuloma venereum, tuberculosis, and schistosomiasis), Hirschsprung's disease (aganglionosis), ischemia, radiation, intussusception, and anastomotic stricture. Extraluminal causes include adhesions (the most common cause of small bowel obstruction, but rarely a cause of colonic obstruction), hernias, tumors in adjacent organs, abscesses, and volvulus.

AIMS AND OBJECTIVES

- To study the clinical profile and clinical features of patients presenting with subacute intestinal obstruction (SAIO).
- To study the role of investigations in diagnosis of SAIO.
- To find out the underlying cause of SAIO in patients under study.
- To study the predictors of relief of symptoms in patients with SAIO.
- To study the indications and timing for surgery for SAIO.
- To follow-up the progress of patients and find out the outcome of management.

MATERIALS AND METHODS: This study was conducted at Department of Surgery, G.R. Medical College and J.A. Group of Hospitals, Gwalior (M.P.) from Nov 2011 to Oct 2012. Total number of 63 patients were included in this study.

Inclusion Criterion: All patients presenting to surgery Out Patient Department or in Emergency with the following features of Sub-Acute Intestinal Obstruction (SAIO) were included in the study:

1. Patients who continue to pass feces/flatus beyond 12 hours of onset of symptoms.
2. Lesser degree of abdominal distention.
3. Plain X-ray abdomen showing gas distended bowel loops/multiple air fluid levels.
4. Decision for non-operative treatment was made on the first instance following clinical and radiological evaluation.

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Exclusion Criterion:

1. Patients presenting with acute intestinal obstruction, in whom operative treatment was decided on first instance following clinical and radiological evaluation.
2. Patients presenting with signs of bowel strangulation.

All patients presenting to the Emergency and Out-Patient Department of surgery unit with features of intestinal obstruction were screened to identify the patients with SAIO. Informed consent was obtained from the patients for inclusion in the study.

The patients were interviewed and the presenting complaints, detailed history of illness, past history, information regarding co-morbid conditions, previous treatment/surgery history, etc. were recorded on the pre-designed data sheet. Findings of clinical examination, and investigations (hemogram, random blood sugar, blood urea, serum electrolytes, urine routine and microscopy, etc.) were also recorded on the data sheet.

History, among other things, included the presenting complaints namely, pain and its character, vomiting, abdominal distension, and passage of faces and/or flatus. History of similar illness in past, previous abdominal surgery, and any known abdominal illness was also inquired into.

A detailed clinical examination was undertaken especially noting presence of tachycardia, fever, and abdominal signs like abdominal distension, tenderness, presence of palpable/visible bowel loops, lumps and nature of bowel sound. Digital rectal examination was done in every case noting its findings.

Plain x-ray of abdomen in erect and supine posture were undertaken noting the presence/absence of multiple air-fluid levels, dilated bowel loops, and colonic gas.

Simultaneous with clinical assessment and investigations, the patients were initially managed conservatively. Patients' oral intake was withheld, nasogastric tube was inserted for aspiration of gastrointestinal secretions, intra-venous fluids were administered. Electrolyte imbalance, if present, was corrected.

The patients were observed for features of relief of obstruction like reduction in vomiting, pain score, and passage of feces/flatus, reduction in tenderness and abdominal girth; disappearance of visible/palpable bowel loops; and reduction in nasogastric tube output. The patients were monitored regularly for development of signs of strangulation, viz., tachycardia, fever, abdominal tenderness, etc. If patient developed signs of strangulation, patient was operated on emergency basis. If the patient did not get relieved conservatively within a few hours of observation, exploratory laparotomy was performed.

The patients who got relieved within few hours on conservative treatment were further investigated if there was a history of recurrent similar attacks or if patient developed recurrent symptoms. Ultrasound of the abdomen and pelvis, CT scan abdomen, laparoscopy, some special investigation (Barium meal follow through) were undertaken in a sequential order to look for findings suggestive of intestinal obstruction and specific signs which suggest cause of obstruction.

In case the investigation provided sufficient information to confirm the diagnosis of a lesion explaining the symptoms of SAIO in the patient, appropriate operation intervention was undertaken. In case the investigation failed to provide required information, the next investigation was undertaken. When laparoscopy demonstrated any lesion, it was tackled under the same anesthesia either laparoscopically or by open exploratory laparotomy.

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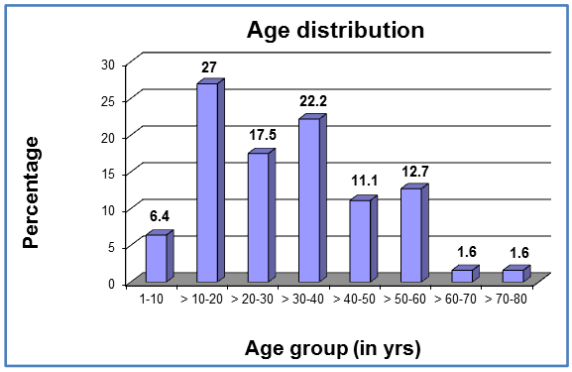
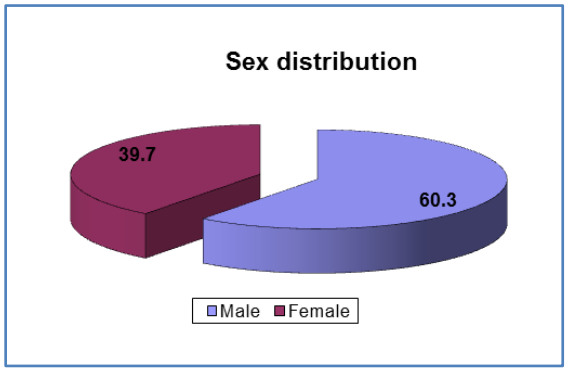
OBSERVATIONS AND RESULTS:

Age interval (years)	No. of patients (%)
1-10	04 (6.4)
> 10-20	17 (27.0)
> 20-30	11 (17.5)
> 30-40	14 (22.2)
> 40-50	07 (11.1)
> 50-60	08 (12.7)
> 60-70	01 (1.6)
> 70-80	01 (1.6)

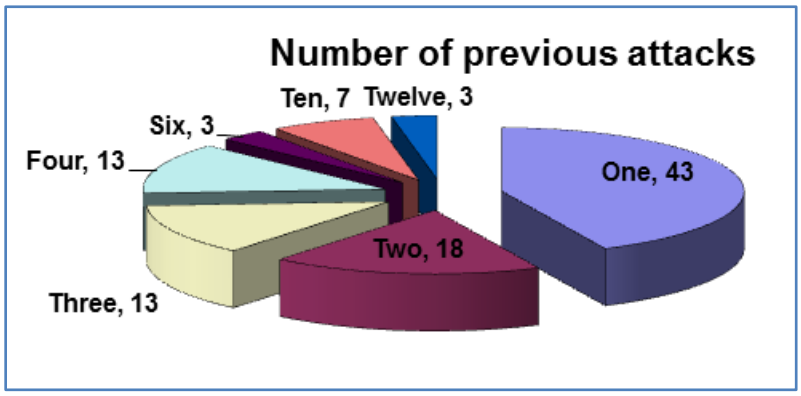
Table 1: Age distribution of 63 patients





No. of previous attacks	No. of patients (%)
One	13 (43)
Two	06 (18)
Three	04 (13)
Four	04 (13)
Six	01 (03)
Ten	02 (07)
Twelve	01 (03)

Table 2: Number of previous attacks in 30 patients



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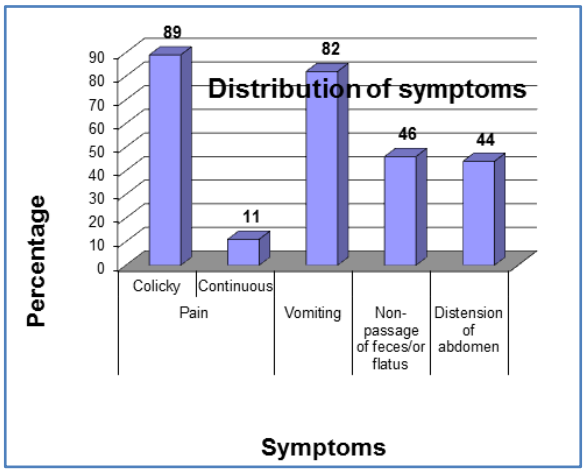
Symptoms	No. of patients (%)
Pain	63 (100)
- Colicky	56 (89)
- Continuous	07 (11)
Vomiting	52 (82)
Non-passage of feces/or flatus	29 (46)
Distension of abdomen	28 (44)

Table 3: Distribution of symptoms in 63 patients



Nine patients (14.3%) had a prior history of abdominal disease. Seven had earlier received anti-tuberculosis treatment for abdominal disease. Four of these 8 patients underwent abdominal surgery earlier: ileo-caecal resection and anastomosis for ileal perforation - one, adhesiolysis for adhesive intestinal obstruction - one, diagnostic laparoscopy/laparotomy (details not known) - one each. Other four patients received anti-tuberculosis treatment empirically. One had taken anti-tuberculosis treatment for genital tuberculosis. One patient was previously diagnosed acid peptic disease by upper GI endoscopy and had received drugs for H. pylori eradication.

Types of surgery	No. of patients
Laparotomy	16
- Abdominal trauma	7
- Intestinal obstruction/ileal perforation	4
- Gynecological procedures	2
- Cause unknown	2
- Appendectomy	1
Laparoscopic procedures	04
- Tubal ligation	2
- Hernia repair	1
- Diagnostic laparoscopy	1

Table 4: Previous abdominal surgery in 20 patients

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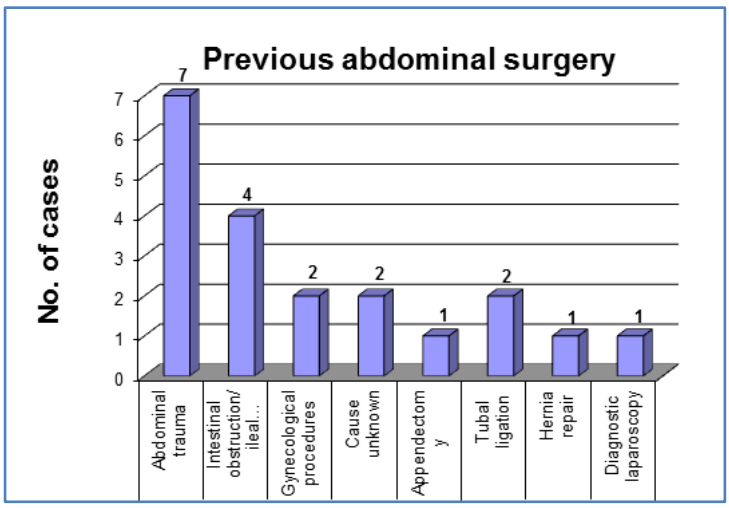
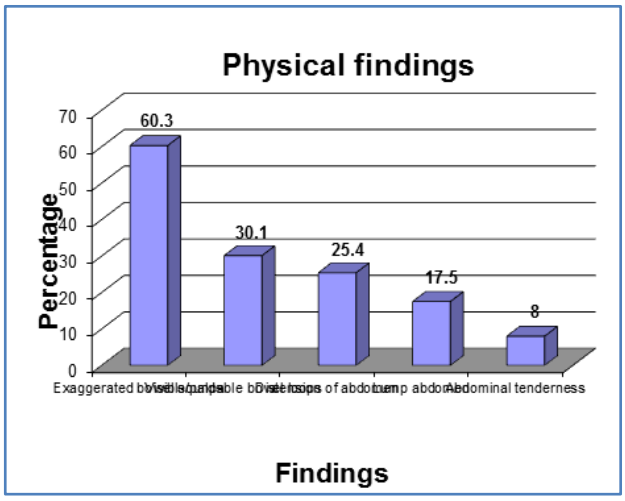


Findings	No. of patients (%)
Exaggerated bowel sounds	38 (60.3%)
Visible/palpable bowel loops	19 (30.1%)
Distension of abdomen	16 (25.4%)
Lump abdomen	11 (17.5%)
Abdominal tenderness	05 (8.0%)

Table 5: Physical findings in 63 patients



Findings	No. of patients
Dilated bowel loops	26
Mesenteric lymphadenopathy	09
Free fluid in abdomen	08
Intussussception	02
Chronic midgut volvulus	01
Contracted pulled-up caecum	01
Ileal stricture	01

Table 6: Distribution of USG findings in 60 patients

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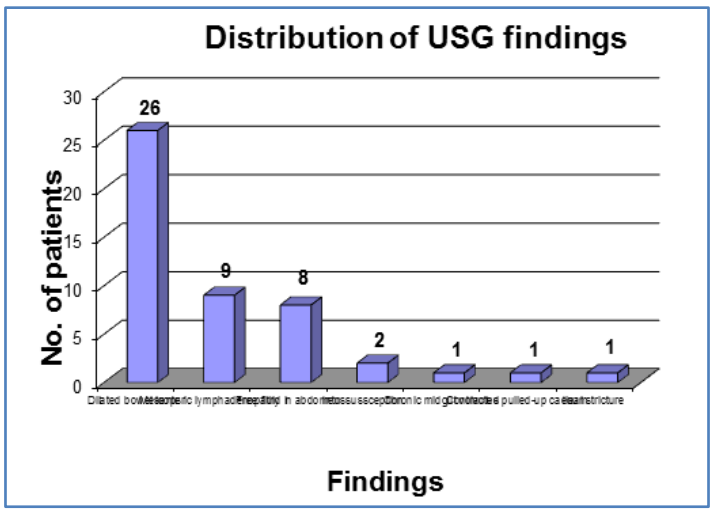
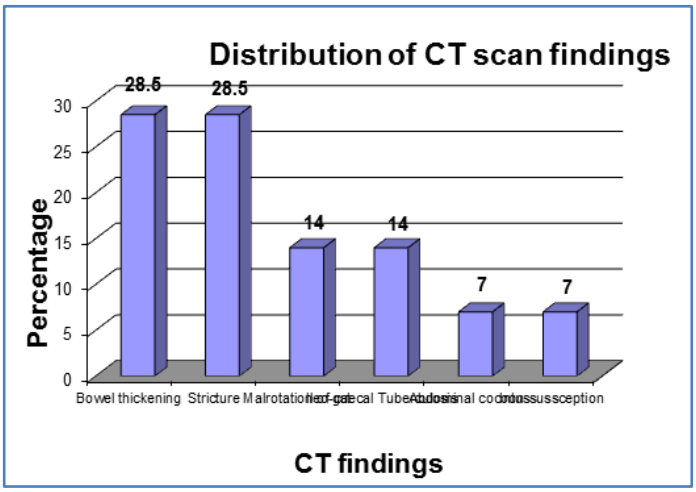


CT findings	No. of patients (%)
Bowel thickening	04 (28.5)
Stricture*	04 (28.5)
Malrotation of gut*	02 (14.0)
Ileo-caecal Tuberculosis*	02 (14.0)
Abdominal cocoon*	01 (07.0)
Intussusception*	01 (07.0)

Table 7: Distribution of CT scan findings in 14 patients

* Findings suggestive of underlying cause of obstruction.



Investigations	X-Ray(in 63 patients)	USG(in 60 patients)	CT Scan(in 15 patients)
Positive Finding	47 (74.60%)	48(80%)	14(93.33%)
Negative Finding	16(25.39%)	12(20%)	1(6.77%)

Table 7.1: Comparison of X-ray, USG and CT Scan findings

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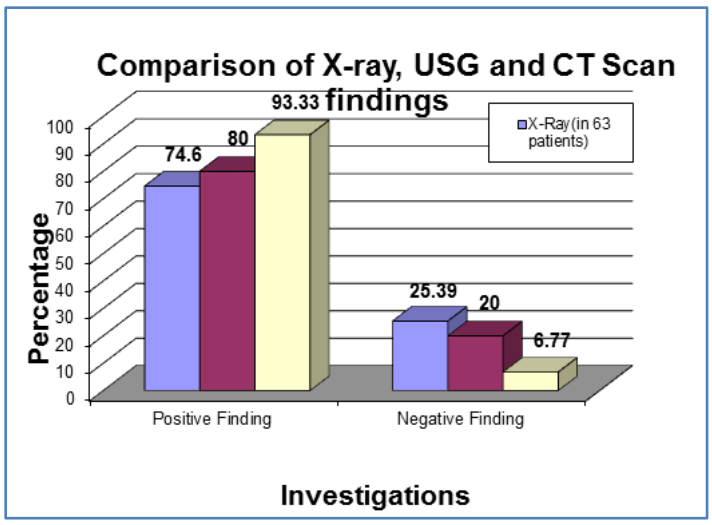

Sl. No.	Operative finding	Diagnostic investigation	Other investigation
1.	Ileal structure	CT-ileal stricture	USG-normal
2.	No abnormality	USG-ileal stricture	-
3.	Bowel adhesions around ileo-caecal mass	CT-ileo-caecal mass s/o tuberculosis USG-RIF lump	
4.	Intussussception	CT-Intussussception	USG-normal
5.	Intussussception	Diagnostic laparoscopy-intussusception	USG-minimal free fluid in pelvis
6.	Mid-gut volvulus with malrotation of gut	CT-Midgut volvulus with malrotation of gut USG-Mid-gut volvulus	-
7.	Adhesions	Diagnostic laparoscopy- adhesion	CT-terminal ileal thickening USG-dilated bowel loops
8.	Intussussception	Diagnostic laparoscopy-intussusception	USG-normal
9.	Abdominal cocoon	CT-Abdominal cocoon	USG-dilated bowel loop
10.	Ileal structure	CT-Ileal stricture	USG-minimal free fluid in pelvis
11.	Multiple ileal strictures with ascending colon and caecal mass	CT-multiple ileal and ascending colon strictures with small bowel feces sign	USG-dilated bowel loops
12.	Mid-gut volvulus with malrotation of gut	CT-mid-gut volvulus with malrotation of gut	USG-dilated bowel loops
13.	Ileal stricture	CT-Ileal stricture	USG-dilated bowel loops
14.	Ileal stricture	Barium mean follow through-ileal stricture	USG-dilated bowel loops

Table 8: Comparison of operative findings with the investigations in 14 patients

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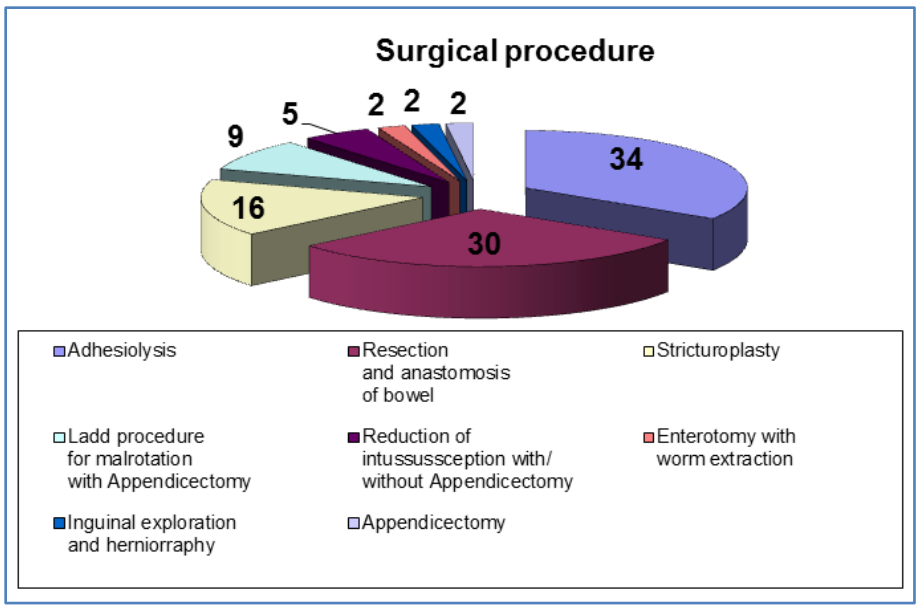

Sl. No.	Operative finding	Diagnostic investigation	Other investigation
1.	Waugh syndrome	Diagnostic laparoscopy intussusception	USG-dilated bowel loops
2.	Ileal stricture	Barium mean follow through - ileal stricture	USG-dilated bowel loops
3.	Hypertrophic ileo-caecal tuberculosis	USG-contracted pulled- up caecum with mesenteric LAP	-
4.	Abdominal cocoon	Diagnostic laparoscopy - abdominal cocoon	USG-dilated bowel loops

Table 9: Comparison of operative findings with the special investigations in 4 patients who required surgery to relieve obstruction

Variable	Non-surgical treatment (%)	Surgical treatment (%)	p value (Chi-square test/ T-Test*)
Mean age (years)	31.9 years	30.7 years	0.966
M:F ratio	2.8:1.0	1.2:1.0	0.206
Colicky pain	18 (95)	38 (86)	0.332
Vomiting	17 (90)	35 (80)	0.480
Distension on history	10 (53)	18 (41)	0.390
Duration of symptoms (Median)	4 days	4 days	
Abdominal disease	05 (26)	04 (09)	0.114
Abdominal surgery	12 (63)	08 (18)	<0.001
Distension of examination	05 (26)	11 (25)	1.000
Tenderness	01 (05)	04 (09)	1.000
Palpable/visible loops	05 (26)	14 (32)	0.662
Abdominal lump	02 (11)	09 (22)	0.318

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Exaggerated bowel sounds	11 (58)	27 (61)	0.796
X-ray abdomen	16 (84)	31 (70)	0.350

Table 10: Comparison of characteristics between patients who were relieved on conservative treatment and those requiring surgery

Cause	No. of patients (%)
Adhesions	14 (33)
Small intestinal strictures	12 (28)
Malrotation of gut with - Intussussception - Volvulus	04 (10) 02 (05) 02 (05)
Hernia (internal/external)	03 (07)
Intussussception	03 (07)
Hypertrophic ileo-caecal tuberculosis	03 (07)
Abdominal cocoon	02 (05)
Ascariasis	01 (02)
Carcinoma hepatic flexure of colon	01 (02)

Table 11: Causes of intestinal obstruction in 43 patients

Surgical procedure	No. of patients (%)
Adhesiolysis	15 (34)
Resection and anastomosis of bowel	13 (30)
Stricturoplasty	07 (16)
Ladd procedure for malrotation with Appendicectomy	04 (09)
Reduction of intussusception with/without Appendicectomy	02 (05)
Enterotomy with worm extraction	01 (02)
Inguinal exploration and herniorraphy	01 (02)
Appendicectomy	01 (02)

Table 12: Surgical procedures in 44 patients

Biopsy report	No. of patients (%)
Tuberculosis - Ileal stricture - Adhesions - Hypertrophic ileo-caecal lesion - Abdominal cocoon	23 (56) 12 (27) 7 (16) 3 (07) 1 (02)
Non-specific inflammatory tissue - Bands - Cocoon - Intussussception and band - Meckel's diverticulum	09 (22) 1 1 1 1
Adenocarcinoma hepatic flexure of colon	01 (02)
Ectopic gastric mucosa in Meckel's diverticulum	01 (02)
Others	7(18)

Table 13: Histo-pathological diagnosis in 41 operated patients

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Features	Tuberculosis (n=23)	Non-tuberculosis (n=21)	p value (Chi-square test/ T-Test*)
Age	32.4 years	30.1 years	0.791*
M:F ratio	1.1:1.0	1.3:1.0	0.967
Colicky pain abdomen	19 (83%)	19 (91%)	0.666
Vomiting	21 (91%)	14 (67%)	0.064
Distension	11 (48%)	7 (336%)	0.373
Abdominal disease	1 (04%)	3 (14%)	0.335
Abdominal surgery	2 (09%)	5 (24%)	0.232
Distension of examination	4 (17%)	7 (33%)	0.303
Tenderness	1 (04%)	3 (14%)	0.335
Visible/palpable bowel loops	7 (30%)	7 (33%)	1.000
Abdominal lump	5 (22%)	4 (19%)	1.000
Exaggerated bowel sounds	10 (44%)	17 (81%)	0.015
Air-fluid levels in X-ray abdomen	16 (70%)	15 (71%)	1.000

Table 14: Comparison between patients with tuberculosis vs. without tuberculosis

Etiology of adhesions	No. of patients (%)
Previous surgery (n=3)	3
Tuberculosis (n=5)	5
Previous surgery + tuberculosis (n=2)	2
Idiopathic (n=4)	4

Table 15: Etiology of adhesions in 14 patients

Time since surgery (months)	No. of Patients (%)	No. of patients who required surgery	Cause of obstruction
Upto 12	11	3 (27%)	Adhesions (2) Abdominal cocoon (1)
13-24	3	1 (33%)	Adhesions (1)
> 24	6	3 (50%)	Adhesions (2) Hepatic flexure carcinoma (1)

Table 16: Distribution of 20 patients on time scale since surgery

It is interesting to note that a few patients (6/63; 9.5%) of SAIO presented with only one of the cardinal features of intestinal obstruction - pain in abdomen. Pain was colicky in 5 patients and continuous in 1. Two patients had recurrent symptoms; 1 had similar episodes 3 times in the past and other had in 10 times. Only 1 patient had a history of laparotomy, was diagnosed tuberculosis and had a full course of taken anti-tuberculosis treatment.

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This patient was relieved of symptoms on conservative treatment. The remaining 5 patients were operated and significant lesions were found in all. Intussussception was found in 2 patients, adhesions in 1; malrotation of gut with chronic mid-gut volvulus in 1 and tuberculous stricture in ileum in 1.

The concordance between the operative findings and the investigations was examined (Table No. 8, 9). It was found that out of total 18 patients, ultrasound identified the cause of obstruction in 4 patients - one of which was found to be false on surgical exploration; showed non-specific abnormality to find out the cause in 11(61%) patients; and was normal in 3(17%) patients. CT scan was done in 10 patients in whom it demonstrated the cause of obstruction correctly in 9(90%) patients. Diagnostic laparoscopy was performed in 5 patients and was successful in identifying the cause of obstruction in all patients.

Two patients expired on 2nd and 4th post-operative day respectively. All the patients were followed up for a period of 6 months. A 12-year-old boy has recurrence of symptoms 4 months following Ladd's procedure and operative reduction of ileo-ileal intussusception for malrotation of gut with intussusception. He required re-laparotomy for recurrent obstruction and found to have recurrent intussusception involving Meckel's diverticulum as a lead point which was missed on previous laparotomy. Two patients on antituberculosis treatment developed drug related complications (gastritis and hepatic encephalopathy respectively) and responded to medical management.

CONCLUSION: In this study, the mean age of patients included was 31.8 years (SD±16.6, ranged 4 to 72 years). The male to female was 1.5:1.0. The duration of symptoms ranged from 1 day to 365 days (median - 4 days). Thirty out of 63 patients had recurrent symptoms, with a median of 2 episodes per patient with range from 1 to 13 episodes.

Colicky abdominal pain (89%) and vomiting (82%) were more frequent as compared to non-passage of feces /or flatus (46%) and distension of abdomen (44%). Eight patients (13%) had earlier received anti-tuberculosis treatment for abdominal disease. A total of 20 patients (31.7%) had history of previous abdominal surgery.

On physical examination, the most frequent finding was presence of exaggerated bowel sounds in 60.3% of patients. Distension abdomen was observed only in one-fourth of the patients. Seven patients had no abnormal physical finding. Five patients had abdominal tenderness and 4 out of these needed surgery to relieve obstruction.

On plain x-ray films, 47 patients (74.6%) had multiple air-fluid levels on erect films. Ultrasonography was undertaken in 60 patients. It showed abnormal findings in 48 patients while it was reported normal in 12 patients. Dilated bowel loops were the most frequent finding. CT scan was performed in 15 patients.

The abnormal findings noted in 14 patients and it showed the cause of obstruction in 10 patients. Diagnostic laparoscopy delineated the cause of obstruction in all the 5 patients in whom it was undertaken. In 18 patients in whom special investigations were available for comparison with operative findings, ultrasound was able to point out the cause of obstruction correctly in 3 patients (17%). CT scan demonstrated the etiology correctly in 9/10 patients. Diagnostic laparoscopy was performed in 5 patients and showed correct cause of obstruction in all patients.

Out of total 63 patients, surgery was needed to relieve obstruction in 30 patients. Out of remaining 33 patients who got relieved by conservative management, investigations revealed lesions requiring elective surgery in 14 patients. Thus surgical treatment was done in a total of 44 (69.8%) patients.

The demographic features, presenting features and investigate findings of the patients who got relieved from SAIO with conservative treatment, and patients who required surgery, were compared. History of abdominal surgery was found to be more frequent significantly in patients in whom the obstruction was relieved on conservative treatment (68% vs. 16%; Chi-Square Test; p value - <0.001; Binary Logistic Regression Analysis; p value - < 0.001).

Most common site of obstruction was ileum (36 patients; 81.8%). Adhesions, seen in 33% of patients, were the most common cause of obstruction followed by small intestinal strictures (28%). Most commonly performed procedure was adhesiolysis (34%) followed by resection and anastomosis of bowel (30%) and stricturoplasty (16%). Most common underlying pathology was tuberculosis, reported in 23 (52%) patients. Hypertrophic ileo-caecal tuberculosis was found only in 3/23 (13%) patients as compared to sericulture ileum in 12/23(52%) patients.

Vomiting was more frequent in patients with tuberculosis (91.3% vs. 66.7%, p value - 0.030) while exaggerated bowel sounds (43.5% vs. 81%, p value- 0.010) were most frequently heard in the non0tuberculous patients.

Amongst the patients who got relieved with non-surgical treatment, time taken for relief ranged from 1 day to 4 days followed admission with a mean of 2.3 days and amongst the operated 26 patients, the mean admission-operation interval was 2.3 days, ranging from 1 to 4 days.

It is interesting to note that a few patients (6/63; 9.5%) of SAIO presented with only one of the four cardinal features of intestinal obstruction - pain in abdomen. At laparotomy, four of these patients were found to have specific lesions causing intestinal obstruction.

Two patients expired on 2nd and 4th post-operative day respectively. All the patients were followed up for a period of 6 months. Three patients were found to have complications/recurrence of symptoms, the remaining were asymptomatic during the follow up.

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AUTHORS:

1. Amit Ojha
2. Anjani Jalaj
3. Shaleen Tiwari
4. Vikram Mujalde
5. Prasheel

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Surgery, G. R. Medical College, Gwalior, M. P.
2. Associate Professor, Department of Surgery, G. R. Medical College, Gwalior, M. P.
3. Senior Resident, Department of Surgery, Lal Bahadur Shastri Hospital, Delhi.
4. Assistant Professor, Department of Surgery, G. R. Medical College, Gwalior, M. P.
5. Junior Resident, Department of Surgery, G. R. Medical College, Gwalior, M. P.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Shaleen Tiwari,
Department of Surgery,
Lal Bahadur Shastri Hospital (LBSH),
Khichnipur, Delhi -91
Email: drshaleentiwari@yahoo.com

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