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Original Research Article

Clinical study and management of small bowel obstruction in 20 cases in a large tertiary care teaching public health hospital in Department of General Surgery

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ABSTRACT

Background: Small bowel obstruction is one of common and most challenging emergency faced by one in surgical practice. Bowel obstructions account for approximately 20% of all surgical admissions in patients with acute abdominal conditions. The aim of the study was to evaluate age and sex distribution along with different etiological factors in age groups, clinical features among with different etiological factors, benefits of early surgical intervention, causes of mortality and morbidity.
Methods: A retrospective observational study was conducted in 20 patients for period of two years. All cases above age of 18years are included. Patients who are pregnant, with history of confirmed and strongly suspected peritoneal carcinosis, undergoing radiotherapy of the abdominal region are excluded from the study.
Results: 20 cases with 60% males and 40% females were included in the study and majority of patients were between age group of 41 to 60 years (55%). Pain abdomen was the most common symptom. Abdominal tenderness was the most common sign present in all patients. Mortality rate was 20% out of which 40% death rate was present in patient operated after 24 hours of admission. Septicaemia was the most common cause of death.
Conclusions: So the intra-abdominal adhesions are the commonest cause of small bowel obstruction while strangulation or obstructed hernia may account for high mortality. Conclusively it can be said that early detection and complete treatment including timely surgery are the essential aspects to decrease morbidities and ultimately decrease mortality.

Keywords: Post-operative adhesion's, Retrospective, Small bowel obstruction

INTRODUCTION

Small bowel obstruction, defined in simple words, is inability to propel the contents of the bowel from the duodenum onwards to the anus.

Acute small bowel obstruction is one the commonest and often the most challenging emergency faced by one in surgical practice. Bowel obstructions account for approximately 20% of all surgical admissions in patients with acute abdominal conditions.[1] the myriad of patho-physiological changes associated with this disorder call for emergent resuscitation and early intervention once diagnosis of intestinal obstruction is suspected. It is said that one should religiously embrace the philosophy of the adage "Never let the sun set or rise towards the treatment of bowel obstruction." In the older days intestinal obstruction was associated with much higher mortality and morbidity, but with better understanding of the underlying patho-physiological changes, better availability of diagnostic and resuscitative facilities, improvement in the anaesthesia techniques, availability

of higher antibiotics and timely surgical intervention, the mortality rates have considerably decreased. Despite these advances in the management of this condition, mortality is still high and ranges from 5-11%.[2] Therefore the need for better understanding of this condition and its appropriate management is imperative. Mode of presentation is same in all, but underlying cause varies in each age group. It can pose diagnostic and treatment challenges with its varied presentation and multiple management options. The surgeon needs to use astute judgment to spot the diagnosis and plan the line of management. The management needs to be individualized for each patient considering his clinical state and progress of the disease pathology.[3]

In this study 20 cases of small bowel obstruction have been studied with evaluation of aetiology, clinical presentation, treatment and complications.

METHODS

Study settings

Department of General Surgery in a large tertiary care teaching public health hospital.

Study period was two years with 20 cases of Sample size. It was retrospective study.

Inclusion criteria

All patients with clinical and/or computed tomography-diagnosed adhesive small bowel obstruction. A detailed history of the symptoms like

- Crampy abdominal pain that comes and goes.
- Loss of appetite.
- Constipation.
- Vomiting.
- Inability to have a bowel movement or pass gas.
- Abdominal distension

X-ray chest and abdomen, will be done in all cases and findings will be noted. CECT neck thorax and abdomen will be done in selected patients to look for obvious pathology.

Exclusion criteria

Exclusion criteria were previously confirmed or strongly suspected peritoneal carcinosis; previous open surgery for endometriosis; previous generalized peritonitis (not including local peritonitis such as appendicitis); previous radiotherapy of the abdominal region; previous obesity surgery; three or more earlier open abdominal operations (not including caesarean section(s)); previous laparotomy for aorta or iliac vessels; age less than 18 years or over 95 years; pregnancy.

RESULTS

In this series majority of the patients presenting were between the age of 41 to 60 years total (55%) (Table 1).

Table 1: Age distribution among patients.

Age of patients (years)	No. of patients (n=20)	% of total
21-30	4	20
31-40	1	5
41-50	5	25
51-60	6	30
61-70	2	10
>70	2	10

In this series adhesive intestinal obstruction was the most common cause of intestinal obstruction, seen in 5 (25%) of the patients. Omental bands were the second most common seen in 4 (20%), obstructed or strangulated hernias were seen in 3 (15%), tuberculous strictures were seen in 2 (10%) cases cause of obstruction in this series. Thus if we see all the 20 cases, in 10% of them intestinal tuberculosis was the cause of intestinal obstruction – two patients had tuberculous stricture and one had tuberculous adhesive intestinal obstruction. Other causes of obstruction seen in this series were ischemic strictures (15%), Meckel's diverticulum (5%). Adhesive intestinal obstruction was the commonest cause of obstruction in the age group 21-30 years (10%), 41-50 years (10%) and the age group 51-60 years (5%).However, the two case of malignancy accounting for small bowel obstructions was seen in patient aged 65 years and 48 years (Table 2).

There were 12 (60%) males and 08(40%) females in this series, the male to female ratio being 1.5:1. If one excludes obstructed or strangulated hernias, the incidence in males was almost equal to that in female (Table 3).

Abdominal pain (100%) and vomiting (85%) were the presenting features in a majority of the patients in our series. Constipation was present in 45%of the patients and abdominal distension in 50% of the patients. Spurious diarrhoea was seen in 10% of the patients and 5% of the patients had fever.

On physical examination, abdominal distension in 50% of the cases. Abdominal tenderness was present in 100% of the cases and guarding in 5% of the cases. Abdominal guarding and rebound tenderness were reliable signs of underlying strangulation. Abdominal tenderness was present in all the 2 cases of strangulated obstruction. Bowel sounds were absent in 20% of the cases and hyper-peristalsis was seen in 5% of the cases.

Table 2: Causes of intestinal obstruction in different age groups.

Causes of obstruction	No. of patients	% of patients	Age of patients					
			21-30	31-40	41-50	51-60	61-70	>70
Adhesive obstruction	5	25	2	0	2	1	0	0
Hernia	3	15	0	0	0	2	1	0
Omental bands	4	20	1	0	1	1	0	1
Tuberculous strictures	2	10	0	0	0	2	0	0
Malignant obstruction	2	10	0	0	1	0	1	0
Ischemic stricture	3	15	0	1	1	0	0	1
Meckel's diverticulum	1	5	1	0	0	0	0	0
Total	-	-	4	1	5	6	2	2
% of patients			20%	5%	25%	30%	10%	10%

Table 3: Sex distribution amount patients with intestinal obstruction.

Sex	No. of patients	% of patients
Male	12	60
Female	08	40

In this series, most common haematological and biochemical abnormalities were leucocytosis (50%). Leucocytosis and acute renal failure on presentation were both more common in strangulated obstruction.

Table 4: Plain radiograph of abdomen.

Abdominal x ray finding	No. of patients	% of patients
Multiple air-fluid levels	07	64
Gas filled dilated loops	12	16
Normal	01	18

In the series of radiological investigations done the plain x-ray of abdomen was taken in all cases. It had positive findings in 19 (95%) of the cases and normal in in remaining 1 (5%) of cases. Plain abdominal radiograph showed air fluid levels and thus was diagnostic in 07 (35%) of the cases and these cases did not require further radiologic investigation (Table 4).

Ultrasonography was done in 20 (100%) of the cases. Most common abnormality shown by USG was dilated bowel loops. CT scan of abdomen was performed in 16(80%) of the cases where diagnosis was doubtful and was able to provide diagnosis in all the 16 (80%).

In this series strangulating obstruction was present in 20% (04 cases) of the patients where as 80% of the patients (16 cases) had simple intestinal obstruction.75% of the patients presented with acute intestinal obstruction and 25% had chronic intestinal obstruction. There was significant correlation between the mortality and presence or absence of strangulation. The death rate among the patients with strangulated obstruction was 50% whereas the same was 12.5% among the patients with simple obstruction (Table 5).

Table 5: Based on type of obstruction with death rate.

Type of obstruction		Total no. of patients	No. of patients expired	Death rate (%)
Based on time of presentation	Simple	16(80)	2	12.5
	Strangulated	04(20)	2	50
Based on speed of onset	Acute	15(75)	3	20
	Chronic	05(25)	1	20

Table 6: Operative procedures.

Cause of Obstruction (no. of cases).	Operative procedure	No. of patients	% of patients
Adhesive obstruction (5)	Adhesiolysis	5	25
	Adhesiolysis & resection anastomosis	0	0
	Adhesiolysis & division of band	01	5
Hernia (3)	Hernia repair	02	10
	Resection anastomosis and hernia repair	01	5
Omental bands (4)	Division of band	4	20
	Resection anastomosis and division of band	0	0
Malignant obstruction (1)	Rt. Hemicolectomy	1	5
Ischemic stricture (3)	Resection anastomosis	2	10

Operative procedure undertaken depended on the causes of obstruction as well as the clinical condition of the patients at the time of surgery. Among the 5 patients with adhesions on laparotomy, adhesiolysis alone was done in all the 5 cases, adhesiolysis with division of band in 1 case. Among the 3 patients with obstructed hernia repair alone was done in 2 cases and 1 patient required resection

with anastomosis and repair of hernia. Of the four obstructions caused by bands, both cases required simple division of the band done. For the one case of the malignant obstructions, resection with anastomosis was done. For the strictures resection with anastomosis was done in 2 cases (Table 6).

Table 7: Outcome among patients with intestinal obstruction.

Outcomes	No. of patients	% of patients
Discharged	16	80
Expired	4	20

In our study series, Mortality rate among the patient with small bowel intestinal obstruction was 20% (4 patients) (Table 7).

Table 8: Association between time of presentation and death.

Duration of presentation	Total no. of patients	No. of death	Death rate (%)
Operated within 24 Hrs.	10	02	20.0
Operated after 24 hrs.	05	02	40

There was significant correlation between the duration of symptoms prior to surgery and mortality. In our study the death rate was 20% among the patients who were operated within 24 hours of onset of symptoms and 40% among the patients who were more than 24 hours after the onset of symptoms (Table 8).

Table 9: Cause of death among patients with intestinal obstruction.

Cause of death	No. of death	% of total death
Septicaemia	1	5
Acute renal failure	1	5
Myocardial infarction	2	10

In our study, of the 4 patients who expired, the most common cause was myocardial infarction responsible for death of two (10%) patient, septicaemia in 1 case (5%) and acute renal failure was the cause of death in 1 (5%) of the patients (Table 9).

DISCUSSION

Small Intestinal obstruction is one of the common emergencies faced in surgical practice. In this study, 20 cases of small intestinal obstruction were studied and a comparative study was made between different factors.

Majority of patients i.e. 30% in this study were found between 51-60 years. Taneja et al (55%), Bhansali et al (47%), Sran et al (41%), Dhuraja et al (52%), have also reported maximum incidence of intestinal obstruction in this age group except for Akgun et al who has reported higher incidence in cases above the age of 60 years, this may be attributed to increased longevity of life in western countries compared to our country (Table 10).[6-8,11,12]

It is deduced that adhesions (45%) mostly post-operative than inflammatory are the common cause of intestinal obstruction. It is in exact agreement with statistical data of Akgun et al (25%), Welch (53%) which studies were carried out in western countries.[1,7] It is in wide contrast with Indian studies of Bhansali, Taneja, Sran, Dhuraja which show hernia as the common cause instead of adhesions.[6,8,11,12] But the incidence of post-operative adhesions has over the years outnumbered hernia as the chief cause of obstruction in our country also, which could be explained by increased number of laparotomies and gynaecological surgeries performed and people becoming more aware and opting for early hernia surgery.

A higher incidence of tuberculous strictures is a noteworthy feature of this series in contrast with other western studies. A higher incidence of tuberculosis in our country and neglect of lesser symptoms of pain and chronic obstruction are perhaps responsible for this higher incidence of acute obstruction in this type of patients. Akgun in his study of 699 cases has reported the median age for adhesive intestinal obstruction to be 37.2±18.5 years and it is 47.9±18.2 years for malignant intestinal obstruction (Table 11).[7]

Table 10: Comparison between age incidences (%) in different studies.

Age groups	Present series	Taneja et al	Bhansali et al	Akgun et al	Dhuraja et al	Sran et al
21-30	04	10	26	15	17	17
31-40	01	18	21	13	19	19
41-50	05	25	13	10	19	15
51-60	06	12	13	13	14	10
61-70	02	5	7	23	6	6
>70	02	-	5	19	1	2

Table 11: Comparison between various causes.

Causes	Present series	Akgun et al[7]	Welch et al[1]	Bhansali et al[6]	Taneja et al[8]	Sran et al[11]	Dhuraja et al[12]
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Adhesions & bands	45	25	53	13	24	8	19
Hernia	15	24	23	48	29	26	33
Stricture	25	1	11	16	10	11	3
Malignancy	10	17	6	4	3	2	4

Table 12: Comparison between symptoms.

Symptoms	Present series	Taneja et al[8]	Dhuraja et al[12]
	(%)	(%)	(%)
Pain	100	88	95
Vomiting	85	90	75
Constipation	45	82	70
Distension	50	31	82
Obstipation	5	54	50

Table 13: Comparison between signs.

Signs	Present series	Sran et al[11]	Taneja et al[8]	Akgun et al[7]
	(%)	(%)	(%)	(%)
Tachycardia	65	40	50	19
Hypotension	0	36	40	31
Dehydration	60	36	34	-
Distension	50	90	78	-
Tenderness	100	60	51	-
Guarding	5	30	17	-
Rigidity	5	38	26	-
Decreased bowel sounds	20	33	31	19

Table 14: Comparison between incidences of strangulation.

Type	Present series	Akgun et al[7]	Welch et al[1]	Sran et al[11]	Bhansali et al[6]	Taneja et al[8]
	(%)	(%)	(%)	(%)	(%)	(%)
Simple	80	68.3	85	80	88	66
Strangulated	20	31.6	15	20	12	34

Table 15: Comparison between fatal complications leading to death.

Complication	Present series	Akgun et al[7]	Taneja et al[8]	Dhuraja et al[12]	Bhansali et al[6]
	(%)	(%)	(%)	(%)	(%)
Septicaemia	5	41.6	65	36	70
ARF	5	8.4	3	3	2
MI	10	50	7	5	18

Abdominal pain (100%), vomiting (85%) and constipation (45%) were the presenting features in a majority of the patients in our series which is in agreement with the studies of Taneja and Dhuraja.[8,12] Most of the studies in the western population have also found intra-abdominal adhesions to be the most common cause of intestinal obstruction. Welch in a meta-analysis of many studies has described the incidence of adhesive intestinal obstruction as 53%.[1] As per the literature, more than 80% of the adhesions occur after surgery, 15% are due to inflammation and remaining few are due to congenital or unexplained causes (Table 12).[4]

On physical examination, there was high incidence of tachycardia, distension, tenderness, dehydration and decreased bowel sounds which is in agreement with studies of Taneja and Sran who also had similar incidences of these four signs.[8,11] Akgun has also reported presence of these signs in a significant number of patients in his series; tachycardia (19%), hypotension (31%), hypoactive bowel sounds (19%) (Table 13).[7]

Strangulating obstruction was present in 20% (4 cases) of the patients where as 80% of the patients (16 cases) had simple intestinal obstruction. Taneja has also reported a similar incidence of strangulation (34%).[8] As per the meta-analysis by Welch, today the incidence of strangulation has been reported in the range of 10-15%.[1] Akgun reported the incidence of simple and strangulated obstruction 68.3% and 31.6% respectively.[7] Frager et al, have reported that in patients with strangulation, surgery performed within 36 hours of the onset of symptoms has a mortality of 8%, whereas delay beyond 36 hours increases the mortality to 25%.[10]

Akgum et al, reported a death rate of 2.5% in patients operated within 24 hours of onset of symptoms and that of 20% in patients operated later than 48 hours.[7] Higher rate of mortality in patient with strangulation as compared to simple strangulations have also been shown by other investigation like Akgun et al, (16.2% vs 7.7%), Welch (18% vs 6%) (Table 14).[1,7]

In our study, of the 4 patients who expired so overall mortality rate is 20%, the leading cause of death was Myocardial infraction (10%). Septicaemia has been found to be the leading cause of death in Taneja, Dhuraja, Bhansali series also.[6,8,12] In Akgun's series cause of mortality was reported as cardio-pulmonary failure (50%), septicaemia (41.6%) and renal failure (8.4%) and have reported a mortality rate of 10.4% in a series of 699 patients.[7] Welch has also reported an overall mortality of 10% among all cases of intestinal obstruction (Table 15).[3]

In the series of radiological investigations done the Plain X ray of abdomen was taken in all cases. It had positive findings in 19 (95%) of the cases and normal in in remaining 1 (5%) of cases. Plain abdominal radiograph showed air fluid levels and thus was diagnostic in 07 (35%) of the cases and these cases did not require further radiologic investigation This compares favourably with the study by Maglinte et al who have reported, in their series, that abdominal radiography in conjunction with the clinical examination alone is diagnostic in only 50-60% of cases of small bowel obstruction.[9]

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