
ORIGINAL RESEARCH ARTICLE**A Study on Clinical Profile & Management of Acute Intestinal Obstruction***Abhijeet Patil¹ and Dhirendra Wagh²**Senior Resident, B.K.L. Walawalkar Rural Medical College, Sawarde, Dist. Ratnagiri¹,**Professor, Jawaharlal Nehru Medical College, Sawangi, Wardha, Maharashtra, India²*

Abstract:

Acute intestinal obstruction is a failure of aboral progression of intestinal contents. The overall mortality and morbidity of bowel obstruction is substantial. Therefore better understanding of pathophysiology, improvement in diagnostic techniques, fluid and electrolyte correction, much potent antibiotics and knowledge of intensive care is required.

The present study was carried out to find out the common causes, variation in clinical features, morbidity and mortality rate related to intestinal obstruction. Results of the study showed that postoperative adhesions is most common cause of intestinal obstruction. Small bowel obstruction is more common than large bowel obstruction. Large bowel obstruction is more common in patients above 40 years than in younger group. Abdominal pain, vomiting, distension and constipation are the four cardinal features of intestinal obstruction, present in most of the cases. Plain x-ray abdomen taken in erect posture is the single most important investigation required for the patients. Intravenous fluids and electrolytes, gastrointestinal aspiration, antibiotics and then appropriate surgery are still the main stay of the treatment.

Among the factors influencing the mortality and morbidity are age, state of hydration, nutritional status, viability of the bowel, etiology of obstruction, site of obstruction, delay in diagnosis and surgical intervention and associated medical illness.

Therefore, early diagnosis of obstruction, skillful operative management, proper technique during surgery and intensive postoperative treatment carries a grateful result.

Key words:

Intestinal obstruction, adhesions, morbidity, mortality, early intervention

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Introduction:

Acute intestinal obstruction is one of the most common surgical emergencies. It involves a partial or complete blockage of the bowel which induces mechanical impairment or complete arrest of the passage of content through the intestine. Obstruction may occur in the small bowel (SBO) or large bowel (LBO).⁽¹⁾ SBO is mainly of two types, Mechanical and functional obstruction. Mechanical obstruction means that luminal contents cannot pass through the gut tube because the lumen is physically blocked or obstructed, whereas functional obstruction means that luminal contents fail to pass because of disturbances in gut motility that prevent coordinated transit from one region of

the gut to the next. This form is commonly referred to as ileus or pseudo-obstruction.⁽²⁾ LBO can result from either mechanical interruption of the flow of intestinal contents or by the dilation of the colon in the absence of an anatomic lesion. Intussusception is a unique type of obstruction that results from invagination of a segment of bowel into another.⁽³⁾

Volvulus (an axial twist of the gastrointestinal tract around its mesentery),⁽⁴⁾ Gallstone ileus (mechanical bowel obstruction), Adhesions^(5,6) (postoperative or postinflammatory), hernias, worm obstruction due to *Ascaris lumbricoides* are frequent causes of intestinal obstruction. Sigmoid volvulus, caecal volvulus, Congenital cysts

(e.g enterogenous cyst) and tumors (e.g. non-Hodgkin lymphoma) are also potential causes of this disorder.

Symptoms of intestinal obstruction includes abdominal pain (colicky), vomiting, abdominal distension and obstipation (failure to pass flatus and faeces).⁽⁷⁾ Visible peristalsis may be seen in thin patients while in others distention may be prominent.

Complete obstruction typically is treated with immediate surgery, while partial obstruction seldom requires surgery. Patients with partial bowel obstruction may be treated conservatively with resuscitation and tube decompression alone.

Many Indian studies demonstrated that the pattern of intestinal obstruction differs from the Western world with obstructed hernias being the most important cause. However, little data is available from the Central part of the India especially from the rural population. Therefore, similar study has been undertaken

- To identify the common causes of acute intestinal obstruction .
- To study the various clinical features of intestinal obstruction.
- To determine morbidity and mortality rate.

Material and Methods:

Patients that attended the outpatient department and the casualty and those who got admitted in the surgical wards of our hospital in the period of 2 year were included in the study.

Inclusion criteria –

- Age: 1 – 85 years of age
- Patients with acute intestinal obstruction who have undergone operative management are included in this study.

Exclusion criteria –

- Patients who refused surgical intervention were excluded
- Patients those who were treated conservatively for subacute intestinal obstruction.

Cases selection was done in the criteria of history, clinical examination and radiological examination. Routine blood and urine investigations, as well as plain x-ray of erect abdomen to detect fluid gas levels were carried out in all the selected cases.

Immediately after the admission along with above procedure, resuscitation with IV fluids especially ringer lactate and normal saline infusion started till the hydration and urine output become normal. Nasogastric

decompression with Ryle's tube was carried out and antibiotic prophylaxis started and close observation of all bedside parameters (like pulse rate, BP, RR, abdominal girth, bowel sounds and tenderness and guarding) was done.

Patients who showed reduction in abdominal distension and improvement in general condition were managed by conservative treatment. Such individuals are excluded in this study. Patients with clear-cut signs and symptoms of acute obstruction were managed by appropriate surgical procedure after resuscitation. Surgery adopted and criteria for deciding the procedure were noted.

The postoperative period was monitored carefully and all parameters were recorded hourly or four hourly basis depending upon the patients general condition and toxemia. Routine intermittent oxygen inhalation was instituted in patients having strangulation of the bowel to reduce the damage induced by ischemia. Postoperative follow up after the discharge of patients was done in majority of the patients up to 3 months. Most of the patients did not come for follow up after one or two visits.

The results are tabulated mostly stressing on following points age, signs and symptoms,

etiology, radiological findings, operative management, causes of mortality, post operative complications adopted.

All the information was collected using a structured proforma. Completed information was entered in computer software.

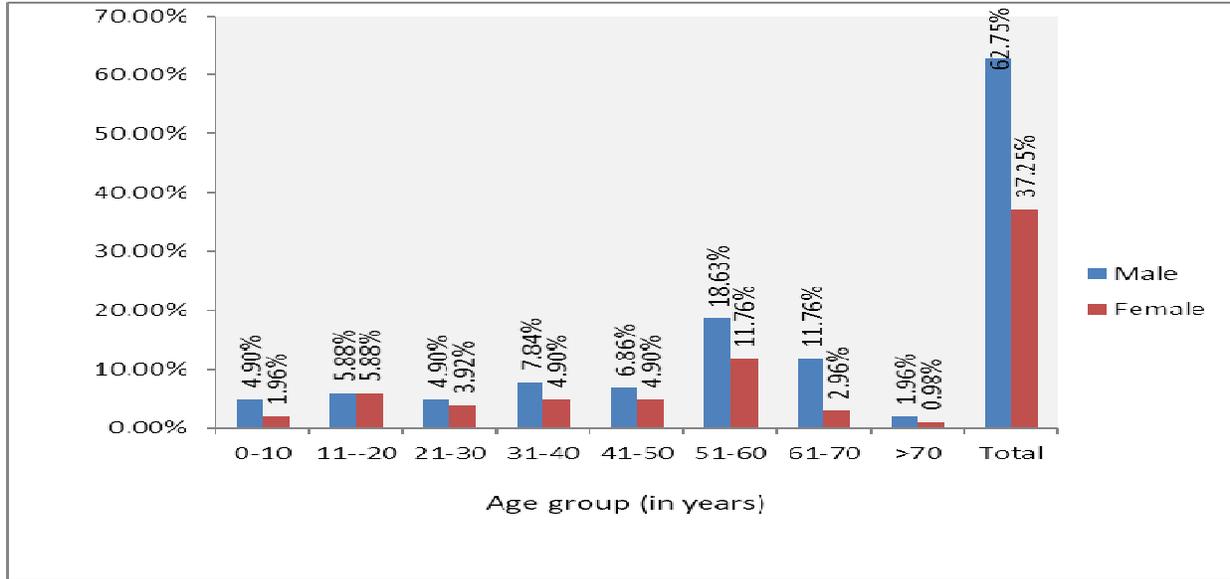
- Nominal data such as demographic data were presented as number and percentages.
- Continuous data (age, duration of disease, pulse BP) were expressed as mean, standard deviation and range.
- *Chi-Square test* or *Fisher exact test* were applied as appropriate for comparison of nominal data.
- For continuous data, *Unpaired t test* was applied to compare two group

Results:

Age

Out of the 102 patients, 62.75% (64) patients were males and 37.25% (38) patients were females. Male to Female ratio is 1.68: 1. Majority of patients were in the age group of 50 – 60 years. (**Graph 1**)

Graph 1: Age wise and Gender wise distribution of patients:



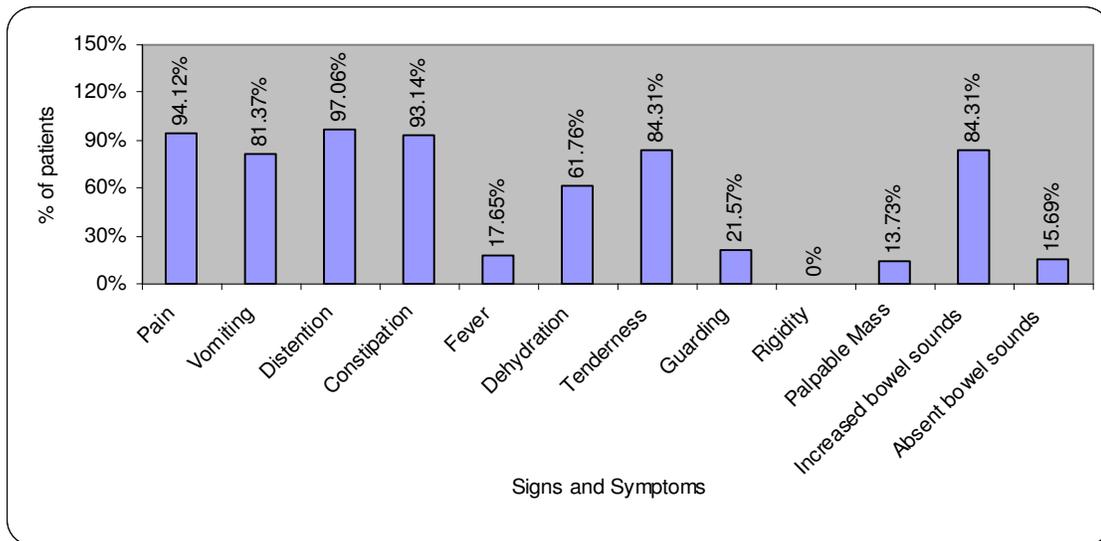
Sign and symptoms:

Out of 102 patients, majority had pain, constipation, distention followed by vomiting.

Of the total patients increased bowel sounds and tenderness were the major signs.

(Graph 2)

Graph 2: Distribution of patients according to signs and symptoms:



Of the total patients 94.12% (96) patients complained of pain while 5.88% (6) patients had no pain. Duration of pain was for 1 day in 39.22% (40) patients, for 2 days in 38.24%

(39) patients and 16.67% (17) patients complained of pain for more than 2 days. **(Table 1a)**

Table 1a: Distribution of patients according to duration of pain

Duration of pain(days)	No of patients	Percentage (%)
1	40	39.22
2	39	38.24
>2	17	16.67
No Pain	6	5.88
Total	102	100.00

Out of 102 patients 81.3% (83) patients had vomiting for 1 day, 13.73% (14) patients complained of vomiting for 2 days, while only 0.98% (1) patient complained of vomiting for

more than 2 days. 3.92% (4) patients had no complains of vomiting. **(Table 1b)**

Table 1b: Distribution of patients according to duration of vomiting

Duration of vomiting(days)	No of patients	Percentage (%)
1	83	81.37
2	14	13.73
>2	1	0.98
No Vomiting	4	3.92
Total	102	100.00

Out of 102 patients 94.12% (96) patients had complains of distention and it was absent in 5.88% (6) patients. (**Table 1c**)

Table 1c: Distribution of patients according to presence of distention

Presence of distention	No of patients	Percentage(%)
Present	96	94.12
Absent	6	5.88
Total	102	100.00

Out of 102 patients 93.12% (95) patients had complains of constipation and it was absent in 6.86% (7) patients. (**Table 1d**)

Table 1d: Distribution of patients according to presence of constipation

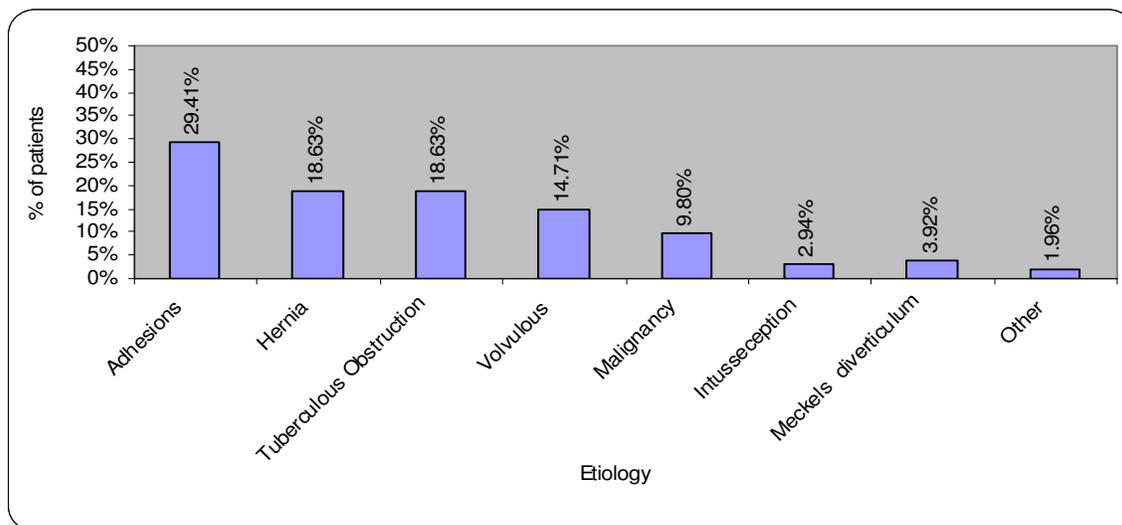
Presence of constipation	No of patients	Percentage (%)
Present	95	93.14
Absent	7	6.86
Total	102	100.00

Etiology:

Of the 102 patients, around 29.41% (30) patients suffered from the adhesions, 18.63% (19) suffered from obstructed hernias, 18.63% (19) had tuberculous obstruction, while 14.71%(15) suffered from volvulus. Malignancy was found to be cause in 9.80% (10) patients while Meckel's diverticulum was

cause in 3.92% (4) patients. Intussusception was cause in 2.94% (3) patients. Adhesive intestinal obstruction was the most common cause of intestinal obstruction. Other causes included 1.96% (2) patients, one with paralytic ileus and another with mesenteric vein thrombosis. (**Graph 3**)

Graph 3: Distribution of patients according to etiology



Of the 30 patients presenting with adhesions, 83.33% (25) patients had postoperative adhesions while in 16.67% (5) patients cause was not known. (Table 2a)

Table 2a: Distribution of patients according to type of adhesions

Cause of adhesions	No of patients	Percentage (%)
Post operative	25	83.33
Others	5	16.67
Total	30	100.00

Of the 15 patients presenting with volvulus, 80% (12) patients had sigmoid volvulus, while 20% (3) patients had ileal volvulus. (Table2b)

Table 2b: Distribution of patients according to type of volvulus

Cause of volvulus	No of patients	Percentage(%)
Sigmoid	12	80.00
Ileum	3	20.00
Total	15	100.00

Out of 19 patients presenting with obstructed hernia, 63.16% (12) patients had right sided obstructed inguinal hernia, 26.32% (5) patients had left sided obstructed inguinal

hernia. 5.26% (1) patient had obstructed incisional hernia, 5.26% (1) patient had obstructed umbilical hernia. (Table 2c)

Table 2c: Distribution of patients according to type of hernia

Type of hernia	No of patients	Percentage(%)
Right Inguinal	12	63.16
Left Inguinal	5	26.32
Incisional	1	5.26
Umbilical	1	5.26
Total	19	100.00

Out of 10 patients of malignancy, maximum were of sigmoid colon 40% (4) patients, followed by descending colon 20% and caecal

malignancy 20% (2 patients each) hepatic flexure and splenic flexure malignancy consisted of 10% (1 patient each). (Table 2d)

Table 2d: Distribution of patients according to site of malignancy

Site of malignancy	No of patients	Percentage(%)
Hepatic Flexure	1	10.00
Splenic Flexure	1	10.00
Descending Colon	2	20.00
Sigmoid Colon	4	40.00
Caecum	2	20.00
Total	10	100.00

The age and sex wise distribution of various etiologies of intestinal obstruction shows that adhesive intestinal obstruction and tuberculous intestinal obstruction are more common in

younger age group [<40 years] while obstruction due to hernia, volvulus, malignancy are more common in older age group [>40 years]. (Table 3)

Table 3 - Age and sex distribution of study group against causes of obstruction #

Cause	Age		0-10		11-20		21-30		31-40		41-50		51-60		61-70		>70	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Adhesions (30)	1	1	3	4	4	1	4	3	3	1	-	-	3	1	1	-	-	-
Tuberculous obstruction (19)	1	-	1	1	-	3	2	2	1	1	1	3	2	1	-	-	-	-
Hernia (19)	-	-	-	-	1	-	1	-	2	-	10	1	4	-	-	-	-	-
Volvulus (15)	-	-	-	-	-	-	-	-	-	2	6	4	2	1	-	-	-	-
Malignancy (10)	-	-	-	-	-	-	1	-	-	1	2	3	1	-	1	1	-	-
Meckel's diverticulum (4)	1	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intussusception (3)	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Others (2)	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-
Total (102)	7		12		9		13		12		31		15		3			

Radiological findings:

Out of 102 patients, x ray abdomen standing was done in 81.38% (83) patients. Multiple air fluid level was seen in 93.98%

(78) patients , ground glass appearance was seen in 4.82% (04) patients . About in 18.62% (19) patients x ray abdomen standing was not done. All of them were suffering from obstructed hernia. **(Table 4)**

Table 4 - Radiological findings of x ray abdomen standing among the patients

X ray abdomen findings	No of patients	Percentage(%)
Multiple air fluid level	78	93.98%
Ground glass appearance	05	4.82%

Operative management:

Adhesiolysis (24.51%) was most common of the operative management done

followed by resection anastomosis (19.61%) and illiotransverse anastomosis (16.67%) followed by herniorraphy(16.67%). **(Table 5)**

Table 5: Distribution of patients according to type of operative management

Type of operative management	No of patients	Percentage(%)
Adhesiolysis	25	24.51
Resection Anastomosis	20	19.61
Derotation of Volvulus	12	11.76
Hemicolectomy	13	12.75
Sigmoidectomy	10	9.80
Hernioraphy	17	16.67
Ilio Transverse Anastomosis	17	16.67

Causes of mortality

Out of 102 patients, death occurred in 7 patients (6.86%), 3 patients were of malignancy (30%), 3 were of tuberculous

abdomen (15.79%), 1 was of volvulus (6.67%)

All of the 7 patients died due to septicemia. **(Table 6)**

Table 6: Distribution of patients according to causes of mortality

Causes of mortality	No of patients	Mortality(%)
Adhesions	30	0(0%)
Hernia	19	0(0%)
Tuberculous Obstruction	19	3(15.79%)
Volvulus	15	1(6.67%)
Malignancy	10	3(30%)
Intussusception	3	0(0%)
Meckels diverticulum	4	0(0%)
Other	2	0(0%)

Post operative complications:

Out of patients who had postoperative complications most common was fever in 17.65% (18) patients, followed by wound gaping in 16.67% (17) patients. Prolonged

ileus was seen in 9.80% (10) patients. More severe complications like burst abdomen occurred in 4.90% (5) patients, faecal fistula in 2.94% (3) patients. Short bowel syndrome occurred in 0.98% (1) patient. **(Table 7)**

Table 7: Distribution of patients according to post operative complications

Post operative complications	No of patients	Percentage(%)
Wound Gaping	17	16.67
Fever	18	17.65
Prolonged Ileus	10	9.80
Faecal Fistula	3	2.94
Burst Abdomen	5	4.90
Short Bowel Syndrome	1	0.98
Septicaemia(Death)	7	6.86
No Complications	44	43.14

In our study both 19 patients of tuberculous obstruction and 10 patients of malignancy suffered from various post operative complications like fever, wound gaping,

prolonged ileus , faecal fistula burst abdomen and even septicaemia (death).

It was found that tuberculous obstruction and malignancy are more prone for complications.

(Table 8)

Table 8 - Association of etiology with postoperative complications

Etiology	Postoperative complications		Total
	present	absent	
Adhesions	07(23.33%)	23(76.66%)**	30
Tuberculous obstruction	16(84.21%)**	3(15.79%)	19
Hernia	9(47.36%)	10(52.64%)	19
Volvulus	13(86.66%)	2(13.34%)	15
Malignancy	8(80%)**	2(20%)	10
Meckel's diverticulum	1(25%)	3(75%)	4
Intussusception	2(66.67%)	1(33.33%)	3
Others	2(100%)	-	2
Inference	Tuberculous obstruction and malignancy are more prone for complications		

Discussion:

Acute intestinal obstruction is one of the most common surgical emergencies. The overall mortality and morbidity of bowel obstruction is substantial.^(1,2) *Brewer et al* analysed 1000 consecutive abdominal surgeries and reported an incidence of 2.5%.⁽⁸⁾ The present study showed increased incidence of intestinal obstruction between 51 – 60 years of age. Similar results shown by Playforth,⁽⁹⁾ G. J. Cole,⁽¹⁰⁾ S. S. Gill.⁽¹¹⁾

In our study, majority of patients had symptoms of distention (97.06%), pain (94.12%), constipation (93.14%), tenderness (84.31%), increased bowel sounds (84.31%), vomiting (81.37%) and dehydration (61.76%). However symptoms of guarding, absent bowel sounds, fever and palpable mass was seen in fewer number of subjects. Similar findings were observed by other authors. In a study by *Rehman*, the commonest symptoms were abdominal pain 54 (100%), abdominal distension 49 (90%), vomiting 42 (78%), absolute constipation 37 (68.5%), dehydration 33 (61%), fever 16 (29.6%), mass right iliac fossa 8 (15%), inguinoscrotal swelling 10 (18%).⁽¹²⁾ In a study by *Madziga*, abdominal pain 88.7%, vomiting 84.8%, and constipation 78.8% were the main symptoms while

tenderness and abdominal masses were common signs.⁽¹³⁾ A prospective study by *Haridimos M et al* in 150 patients, absence of passage of flatus (90%) and/or feces (80.6%) and abdominal distension (65.3%) were the most common symptoms and physical finding, respectively.⁽¹⁴⁾ The above findings indicate that the clinical profile of Indian patients with intestinal obstruction is same as that of others.

The present study indicates that adhesive obstruction is much more likely than other causes, with the highest incidence rate (29.41%). Thereinto, 83.33% of the adhesions were secondary to the previous abdominal operation. Perhaps, the evolved modern surgery has induced the increase in iatrogenic peritoneal adhesions. A review revealed that adhesions might occur in more than three-fourths of patients following laparotomy, because peritoneal trauma resulted in a unique inflammatory process in which fibrin formation and fibrinolysis played a central role.⁽¹⁵⁾

Every violation of the peritoneum carries a potentially lifelong risk of this disease, and the effects of adhesions are unpredictable but widely existent in a significant health care burden by its recurrent nature.⁽¹⁵⁾ Increasing utilization of laparoscopic surgery may reduce

the extent and incidence of adhesions, and laparoscopic adhesiolysis. In experienced hands, it may be successful in managing acute obstruction or serve as a planned procedure when the obstruction has been resolved.⁽¹⁶⁾

In the present study, other main causes of intestinal obstruction were hernia and tuberculous obstruction in 18.63 % patients, volvulus in 14.71% patients, malignancy in 9.80% patients, meckel's diverticulum in 3.92%, intussusception in 2.94% patients and other causes in 1.96% patients. In volvulus, sigmoid volvulus occurs in 80% patients while ileal volvulus occurs in 20% of patients. Right sided inguinal hernia obstruction was responsible in 63.16% patients. Left sided inguinal hernia obstruction was responsible in 26.32% patients while incisional and umbilical hernia was seen in 5.26% of patients. Malignancy was a cause of obstruction in only 10 patients.

Similar findings were observed by other authors. In a study by *Rehman*, the commonest etiology were adhesions and bands 23 (42.5%), intestinal tuberculous 13 (24.07%), stricture + ileocecal mass, hernias 10 (18.51%), tumours 03 (5.5%), worm infestations 03 (5.5%), intussusception 02 (3.7%).⁽¹²⁾ In a study by *Pal et al* in peripheral district of eastern India in

150 episodes of mechanical intestinal obstruction, external hernia accounts for the largest number of cases followed by volvulus.⁽¹⁷⁾ In a study by *Madziga*, obstructed external hernias, 35.0% were the commonest cause of mechanical bowel obstruction; with indirect inguinal hernia, 80.1% accounting for most hernias. Intraperitoneal adhesions, accounted for 26.61% of cases. Other causes in descending order were intussusception 80 (21.5%), malignant colonic obstruction 34 (9.14%) and sigmoid volvulus 11 (2.95%).⁽¹³⁾ Few authors reported other major causes of intestinal obstruction. In a study by *Adhikari S et al* in Eastern India, the main cause of obstruction was obstructed hernia followed by malignancy.⁽¹⁸⁾ A prospective study by *Haridimos M et al*, adhesions (64.8%), incarcerated hernias (14.8%), and large bowel cancer (13.4%) were the most frequent causes of obstruction.⁽¹⁴⁾ In our study we found two rare cases one with mesenteric vein thrombosis causing intestinal obstruction and other with paralytic ileus leading to obstruction. Cause of ileus could not be traced out. Patient with paralytic ileus was found to be chronic ganja (Cannabis) addict.

Operative management was done in all patients. Out of them 24.51% patients

underwent adhesiolysis, 19.61% underwent resection anastomosis, 16.67% patients were treated with herniorraphy and same number of patients underwent ilio transverse anastomosis. 12.75% patients were managed with hemicolectomy, 11.76% with derotation of volvulus and 9.80 were managed with sigmoidectomy. The pattern of operative treatment in our study reflects the standard approach to the management of patients with intestinal obstruction. In a study by *Rehman*, the commonest etiology were managed by adhesiolysis + band division 27 (50%), resection and end to end anastomosis 13 (24%), Right hemicolectomy 9 (17%), simple reduction & defect repair 5 (9%), enterotomy 3 (5.5%).⁽¹²⁾

In a study by *Mohamed et al* in Saudi Arabia, surgical intervention was necessary in 61 patients (73%) while 23 patients (27%) responded to conservative treatment.⁽¹⁹⁾

The time interval before operation is a critical factor for acute intestinal obstruction, because prolonged conservative therapy might be harmful and potentially lethal, and on the other hand, too radical option of operation will aggravate the burden of the patients. The present study indicates that all the patients with acute intestinal obstruction can be cured

with operation. The period of conservative therapy is better to be limited within one week after the onset of symptoms, and then conversion to surgery should be considered.⁽²⁰⁾

In our study, mortality was 6.86%, of them 3 patients had tuberculous obstruction, 3 had malignancy and 1 had volvulus. All of them died due to septicemia. It shows that the mortality in our study is less as compared to mortality reported by the other studies. In a study by *Pal et al* in 150 episodes of mechanical intestinal obstruction, operative mortality was 28%. The highest mortality rate (41.3%) was found in volvulus.⁽¹⁷⁾ In a retrospective study by *Mohamed et al*, the mortality rate was 3.5%. In a study by *Madziga*, mortality rate was 9.14%.⁽¹³⁾ Study by *Chaib E et al* showed operative mortality 9.09%.⁽²¹⁾

Present study showed that most of the patients (43.14%) had no complications however fever occurred as a postoperative complication in 17.65% of patients. In a study by *Pal et al* the major adverse factors were gangrenous bowel and large bowel obstruction.⁽¹⁷⁾ In a study by *Chaib E et al*, complications occurred in 15.7% of patients following operative intervention; wound infection was the most common postoperative

complication.⁽²¹⁾ Similar results shown in the study done by *Madziga*.⁽¹³⁾

In our study about 52 (50.98%) patients turned for follow up and were followed up for a period of 3 months. 43(42.15%) patients didn't turn up for follow up. The results of present study are in the line with published literature, indicating that the sign and symptoms in Indians are more or less as that of West. Etiology of acute intestinal obstruction matches with that of West. The mortality in our study is less as compared to published literature. It is apparent from this report that increased efforts to adhesiolysis before complication occurs are likely to reduce the incidence and mortality from intestinal obstruction. In addition research aimed at finding ways to reduce adhesion formation may reduce the incidence of adhesive obstructions. For affected patients, high quality surgical expertise coupled with sound clinical judgment and early surgery when needed will greatly improve survival.

Conclusion:

Intestinal obstruction remains an important surgical emergency. Patients with a clinical picture of obstruction of the bowel demand vigorous resuscitation, correction of

fluid and electrolyte, which can be severe, and life threatening.

Postoperative adhesions is the common cause to produce intestinal obstruction. Clinicoradiological and operative findings put together can bring about the best and accurate diagnosis of intestinal obstruction.

Early diagnosis and operative treatment followed by proper postoperative management is necessary to prevent mortality and morbidity. Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multi-system organ failure.

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