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Original Research Article

Clinico-pathological study of intestinal obstruction and its management

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ABSTRACT

Background: Intestinal obstruction is one of the most common surgical emergencies, for which the therapeutic strategy has progressed through several evolution. The aim was to study the various etiologies, spectrum of clinical features, factors affecting type of management- conservative or operative, various surgical procedures and its outcome in relation to etiological factors in patients of intestinal obstruction.
Methods: It is prospective study including 200 patients fulfilling the inclusion criteria were part of this study conducted from March 2015 to September 2016 with a provisional diagnosis of intestinal Obstruction carried out in Gandhi Medical College associated Hamidia Hospital, Bhopal, Madhya Pradesh, India.
Results: The patients were mostly males and from age group 30 -50 years and least were from 70-80 years. The most common clinical symptom was abdominal pain and the sign was tenderness, least common were irreducible hernia and mass per abdomen. Commonest etiology was adhesion and least was worm infestation. Most patients were treated by operative procedure in comparison to conservative management, commonest procedure done was laparotomy with resection and anastomosis and hernioplasty was least common. The histopathology study of resected specimens reveals inflammation as the commonest and the malignancy as the least one. The mortality was highest in patients of adhesions and the least in patients of obstructed hernia. Discharge rates were maximum in patients of adhesion and minimum in patients of volvulus.
Conclusions: In our study it had been observed that early diagnosis, adequate preoperative hydration, prompt investigations and early operative intervention improves survival in patients of intestinal obstruction. If preoperative preparation is improved and anesthetic management is more skillful, the mortality from abdominal exploration should approach to minimum.

Keywords: Exploratory laparotomy, Intestinal obstruction

INTRODUCTION

Intestinal obstruction is one of the most common surgical emergencies, for which the therapeutic strategy has progressed through several evolution. Intestinal obstruction, up to date, remains a global surgical problem. In fact, there are very few problems in surgical physiology which have earned greater attention than those associated with intestinal obstruction various contentious management issues have continued to be debated, with particular attention focusing on how to avoid bowel strangulation or how to detect it as early as possible. Intestinal Obstruction is reported in ancient literature and is defined as "Interference in the passage of food, liquids and content of the intestine either due to mechanical or neurological cause".[1]

It is predisposed by various underlying conditions which are difficult to define preoperatively. There are various etiologies for acute intestinal obstruction from more

common causes like adhesion, hernia, malignancy to uncommon conditions like intussusception.[2,3]

Though the classical presentation is pain abdomen, vomiting, constipation and distension of abdomen, it needs a complete understanding of surgical anatomy pathophysiology, symptoms and signs of obstruction and necessary investigations for diagnosis. In this study analysis of various causes, anatomical and pathological nature, mode of presentation, age factors, investigation modalities, and surgical management, various complications, mortality and outcome.

Complication of intestinal obstruction include bowel ischemia and perforation, morbidity and mortality associated with intestinal obstruction and declined since advent of more sophisticated diagnostic test, but the condition remained a challenging surgical diagnosis. Physicians who are treating patient with intestinal obstruction must consider the risks of surgery with the consequences of inappropriate conservative management.

METHODS

This study is conducted in the Department of General Surgery at Gandhi Medical College Hamidia Hospital Bhopal, Madhya Pradesh, India. Sample size of a minimum of 200 patients fulfilling the inclusion criteria will be a part of this study conducted from March 2015 to September 2016.Data will be collected from patients who are admitted in surgical wards of Hamidia Hospital, Bhopal, with a provisional diagnosis of intestinal obstruction. Clinical study will be through questionnaires and clinical examination.

All patients will undergo routine and special investigations if indicated treatment modality will be planned once the definitive diagnosis of intestinal obstruction is arrived at. Post-operative observation of patients for any complications. Regular follow up health education for the patients treated.

Inclusion criteria

All cases admitted to hospital with acute /subacute/chronic intestinal obstruction.

Exclusion criteria

- Infants with intestinal obstruction due due to congenital causes
- Patients those who are treated on OPD basis
- Patients who refused admission
- Patients on terminally ill stage
- Post operated patients.

All results were subjected to statistical analysis. Demographic and clinical data from the two groups were compared and intergroup differences among the parameters were recorded and were analyzed by paired t-tests, the student t-test and Chi-squared tests. Student's, t-test was used for intergroup analyses and the chi-square test was used to analyze the level of significance or differences in the incidence of complications. P-value of less than 0.05 was considered statistically significant and p value of less than 0.001 was considered highly significant.

RESULTS

Table 1: Gender distribution of patients studied.

Gender	No.of patients	Percentage
Male	117	58.50%
Female	83	41.50%
Total	**200**	**100.00%**

In our study out of 200 patients, 58.5% were males and 41.5% were females. The study revealed that, incidence was more in male sex.

Table 2: Age distribution of patients studied.

Age group	No. of patients	Percentage
15-24	21	10.50
25-34	36	18.00
35-44	56	28.00
45-54	43	21.50
55-64	34	17.00
65-75	8	4.00
>75	2	1.00
Grand total	**200**	**100.00**

Patients of intestinal obstruction where mainly from age group 35 year to 54 year (49.5%). From 35 year to 44 year comprises of 28% patients and from 45 year to 54 year comprises of 21.5%

Table 3: Duration of symptoms.

Duration of symptoms	No. of patients	Percentage
1-2 days	13	6.50%
2-5 days	102	51%
6-14 days	85	42.50%
15 and above	6	3%

Table 4: Clinical features of patients.

Clinical features	No. of patients	Percentage
Pain	200	100
Vomiting	117	58
Distension	69	34.50
Constipation	50	25
Irreducible hernia	9	4.50
Fever	40	20
Dehydration	14	7

The patients of intestinal obstruction mostly comes in the mean duration of 3-10 days.51% patients comes in duration of 2-5 days and 42.5% patients comes in duration of 6-14 days.

Table 5: Clinical signs of patients.

Clinical signs	No. of patients	Percentage
Tender	101	50.50
Guarding	92	46
Rigidity	43	21.50
Mass	11	5.50

Table 6: Etiology.

Etiology	No. of patients	Percentage
Adynomic obstruction	4	2
Caceal volvulus	8	4
Adhesion and bends	80	40
Ileal stricture	12	6
Ileocaecal TB mass	5	2.50
Intussusecption	4	2
Jejunal stricture	48	24
Obstructed inguinal hernia	8	4
Rectosigmoid growth	13	6.50
Small bowel volvulus	2	1
Stricture followed by perforation	14	7
Warm infestation	2	1
Grand total	**200**	**100**

The predominant symptom in our study was abdominal pain (100%) followed by vomiting (58%) and distention (34.5%) and least common Irreducible hernia 4.5 %

In our study the most observed sign was tenderness present in almost 50.5% patients while guarding is present in 46% patients.

However rigidity was present in only 21.5% patients with obstruction includes 4.5% patients of obstructed hernia and 4% cases of malignancy and 2% case of ileocaecal tuberculosis with perforation while mass was present in 5.5% patients.

Table 7: Operations.

Operation	No. of patients	Percentage
Conservative	5	2.50
Laparotomy and untwisting of volvulus	11	6
Laparotomy and resection and anastomosis	99	49.50
Laparotomy and hernioplasty	8	4.00
Laparotomy and release of adhesion	54	27
APR/LAR	9	4.50
Laparotomy with ileostomy	14	7.00

Table 8: Histopathology in various etiology.

Etiology	Inflammatory	Malignancy	Tuberculosis	Grand total
Adynomic obstruction	0	0	0	0
Caceal volvulus	2	1	5	8
Adhesion and bands	61	0	15	76
Ileal stricture	0	0	12	12
Ileocaecal volvulus	5	0	0	5
Intussusecption	1	0	0	1
Jejunal stricture	24	0	24	48
Obstructed inguinal hernia	7	0	0	7
Rectosigmoid growth	2	11	0	13
Small bowel volvulus	1	0	0	1
Stricture followed by perforation	10	2	2	14
Warm infestation	1	0	0	1
Grand total	**114**	**14**	**58**	**186**

Most common etiology of intestinal obstruction due adhesion and bands and least common worm infestation.

Most common procedure done in intestinal obstruction in our study laparotomy and resection and anastomosis followed by laparotomy and release of adhesionand least common procedure done was laparotomy and hernioplasty.

Inflammation was most common in patients of adhesions and malignancy in patients having rectosigmoid growth on procedure. In our study most common etiology behind

patients of obstruction certified was adhesions and bands and discharged is jejunal stricture while minimum mortality were in patients of adynamic obstruction and minimum discharge rate were from patients suffering from worm infestations

Table 9: Histopathology result.

Histopathy	No. of patients
Inflammatory	114
Malignancy	14
Tuberculosis	58

Table 10: Mortality due to various etiology.

Etiology	Certified	Discharge	Grand Total
Adynamic obstruction	0	4	4
Caceal volvulus	1	7	8
Adhesion and bands	8	72	80
Ileal stricture	3	17	20
Ileocaecal volvulus	0	5	5
Intussusecption	0	4	4
Jejunal stricture	2	38	40
Obstructed inguinal hernia	0	8	8
Rectosigmoid growth	1	11	12
Small bowel volvulus	0	2	2
Stricture followed by perforation	1	14	15
Warm infestation	0	2	2
Grand total	**16**	**184**	**200**

DISCUSSION

The prospective study was done to discuss various etiologies, clinical features, management and its effect on outcome in patients that comes in Hamidia Hospital with features of intestinal obstruction.

In our study out of 200 patients, 58.5% were males and 41.5% were females. Maximum patients belongs to 35-55 years age group. In study of Tahir et al and Venugopal K et al, males were more in number than females.[4,5] Our study also revealed that, incidence was more in male sex, maximum of these patients belongs to low socioeconomic status and 40% patients were associated with other comorbodities out of them 20% were females.

Maximum patients belongs to 35-55 years age group which constitutes 50% patients of intestinal obstruction. 28% of patients belong 35-45 age group. So it has been revealed that maximum patients belong to middle age group. However in this age group both males and females were equal in ratio. Minimum number of patients belong to 65-85 age group of 5% patients mainly males. Tahir et al and Venugopal K et al also have same findings in their studies. The mean age of the patient was 37 years which is comparable with that reported by Ismail et al. Markogiannakis H et al reported mean age of the patients as 63 years while mean age of patients was 25 years in a study conducted by Drozdz W et al.[6-8] These gross discrepancies may be due to different disease patterns in different geographic regions of the world.

The patients of intestinal obstruction mostly comes in the mean duration of 3-10 days.51% patients comes in duration of 2-5 days and 42.5% patients comes in duration of 6-14 days. While 6.5% patients comes in duration of 1-2 days and 3% patients after 14 days. Abdominal pain was the predominant symptom compelling the patients to come to hospital. Venugopal K etal5 has the similar mean duration of presentation as our study.

Patients of intestinal obstruction comes with various clinical features. The predominant symptom in our study was abdominal pain (100%) followed by vomiting (58%) and distention (34.5%).

Abdominal pain was the most common presenting symptom occurring 98.6% patients, followed by vomiting in 78.66% and distention of the abdomen in 34.5% of patients. In many cases of mechanical large bowel obstruction, the episodes are usually spaced farther apart in time and tend to last longer (minutes rather than seconds) compared to small bowel obstruction .Strangulated obstruction was confirmed during surgery in 55% patients in our study in which the operative procedures were laparotomy with resection and anastomosis in 30% patients and ileostomy in 15% patients. The clinical presentation of dynamic bowel obstruction in our patients is not different from those in other studies Qureshi et al, Kuremu et al, Zubaidi et al and Chalya et al with colicky abdominal pain being common to all the patients.[9-12] Second most pronounced symptom was vomiting present in 58% patients out of

which 45% patients have bilious vomiting while 13% patients have vomiting having faecal matter.

Patients with bilious vomiting mostly revealed small bowel obstruction mainly of jejunum and ileum. Patients with faecal vomiting mostly have late presentation and they are also associated with various other comorbidities. They mostly have large bowel obstruction mostly due to carcinomatous growth. Most of these patients were also associated with complains of bleeding per rectum in 5% patients.

The third most common clinical feature was distention in abdomen present in 34.5% patients. The distention of abdomen was found to be more pronounce in patients of ileal obstruction in comparison of jejunal obstruction. However the distention of abdomen was more pronounced in patients of large bowel obstruction in comparison to small bowel obstruction most commonly in old age females and etiology commonly found was volvulus. In study of Tahir et al and Venugopal K et al, vomiting and distention abdomen being the next clinical features after pain having same finding.[4,5]

The other clinical feature were constipation in 25%, fever in 20%, dehydration in 7% and obstructed hernia in 4.5% patients. Constipation is present mostly in patient of old age with irregular dietary food habits.

Most of the cases have been treated with conservative management and pathology in most cases of constipation was adynamic obstruction in comparison to carcinoma or volvulus. Fever and dehydration is present in cases of late presentation with strangulation and most of them are associated with other comorbities also. Nine cases of obstructed inguinal hernia was found with five of them having strangulation with late presentation.

Patients presenting within 1-2 days were mostly having previous history of fever and most of them have intestinal perforation on surgery, etiology being infectious disease mainly tuberculosis. Strangulation was present among patients presenting with small intestinal obstruction based on delayed presentation beyond 72 hours with abdominal pain, bleeding per rectum or faecolent aspirate in the nasogastric tube and with high fever. Patients with very late presentation after 14 days have obstruction due to carcinoma mainly having rectosigmoid growth.

So the past medical history of the patient may be key in making both the diagnosis and establishing the cause. It is especially important to inquire about previous events of bowel obstruction, recent and distant abdominal operations, current medications, a history of chronic constipation, recent changes in the caliber of stools, a history of cancer and its stage at presentation and related treatments (surgery, chemotherapy, or radiation therapy), and a history of Crohn's disease.

Abdominal palpation can reveal the presence of peritoneal signs such as rebound, localized tenderness and involuntary guarding that show vascular compromise or perforation. Abdominal masses should be sought and noted. In our study the most observed sign was tenderness present in almost 50.5% patients while guarding is present in 46% patients. However rigidity was present in only 21.5% patients with obstruction includes 4.5% patients of obstructed hernia and 4% cases of malignancy and 2% case of ileocaecal tuberculosis with perforation while mass was present in 11.5% patients. Rebound tenderness was present in 10% patients of patients. with tenderness. Peritoneal signs like tenderness, rebound tenderness and guarding/rigidity, classical signs of compromised blood supply were observed in patients with strangulation but statistically only guarding/rigidity with rebound tenderness were significant.

Auscultation can determine the presence, frequency, and quality of the "obstructed" bowel sounds. Exaggerated bowel sounds; a cardinal feature of small bowel obstruction was present in 65% cases whereas normal frequency was noted in 10% cases. 25% cases had absent bowel sounds on auscultation of which 35 patients had strangulated obstruction intra operatively.

Failure to predict strangulation early among these patients often delays surgical intervention there by leaving a significant impact on the outcomes. On history strangulation can be predicted among patients presenting with small intestinal obstruction based on delayed presentation beyond 72 hours with continuous abdominal pain, bleeding per rectum or blood stained aspirate in the nasogastric tube and with high grade fever. So clinical examination has its significance in order to exclude cases of strangulation. As reported by many authors in developing countries Shittu et al, Akbar et al, Chalya et al, majority of patients in the present study presented late in poor general condition.[12-14] This was found to be the most important factor influencing the outcome of surgical procedure as also emphasized by a number of authors Qureshi et al, Akbar et al and Adhikari et al.[9-15] This delayed presentation increases morbidity and mortality many-folds, as is evident from our results. Above findings may be further confirmed by other investigational studies like complete blood picture, X-ray abdomen erect, USG abdomen and CECT Abdomen. Plain abdominal films can be diagnostic in 50 - 80% of patients. X-ray abdomen in erect position shows normal in 7.5% cases, multiple air fluids levels in 60% cases, distal small bowel obstruction in 22.5% cases while gas under diaphragm in 5% cases.

CT findings suggestive of obstruction was present in 25%cases while it was not done in 75% cases. CT findings diagnostic of bowel obstruction were intestinal loops greater than 25 mm in diameter and a transition zone between dilated and collapsed bowel loops. (CT) has become a valuable tool in the diagnosis of bowel

obstruction, especially when abdominal films are nonspecific and fail to provide an accurate diagnosis or when strangulation is suspected and visualize the entire intra-abdominal compartment as well as defects in the abdominal wall. In addition, it can demonstrate changes in the intestinal wall and associated mesentery. US is more sensitive and specific than plain abdominal films for the diagnosis of bowel obstruction but not more than CT. US is very much operator-dependent, and the accuracy may be quite variable.

Depending on the various etiological factors involved in the pathogenesis of obstruction, 40% patients have adhesions as the main cause of obstruction. These adhesions were mainly dense inter loop and bands in 25% cases while others are mainly inflammatory in origin in 12.5% cases and others are associated with volvulus in 6% cases. In these cases of adhesive obstruction, 7.5% cases are recurrent cases which were in past resolves by the conservative means of management but this time they resolves by various surgical procedures. Adhesions remains the major leading cause of intestinal obstruction in this era present in age group of 30-50 years. Most of the obstruction is relieved by laparotomy and adhesiolysis. Abdominal pain, vomiting and fever being the main clinical features along with tenderness and leukocytosis present on blood investigations. Tahiretal4 and Venugopal K et al also reported that adhesion is the most common cause of intestinal obstruction followed by tuberculosis and malignancies.[5]

The second most common etiology present in patients was intestinal stricture mainly of small bowel present in 30% patients in which 22% patients shows jejunal and 6% patients present with ileal stricture and rest 2% patients present with large bowel stricture mostly colonic. Most of these strictures had inflammatory pathology and they belong to age group 40 - 60 years. Their relationship with inflammatory bowel disease is obvious. 40 patients were treated conservatively as the obstruction is mostly partial.15 patients were treated initially with conservative means but later they requires surgery as the initial treatment fails. They were mainly treated by segmental resection and primary anastomosis. Rest five patients have complete obstruction treated by resection and anastomosis.

Third most common etiology behind in patients was intestinal tuberculosis with mass or stricture. 10% patients of intestinal obstruction comes with past history of tuberculosis. Most belongs to age group 30-50 years. Three patients of obstruction have past history of bovine tuberculosis. Out of 20 patients three patients comes in emergency with symptoms of peritonitis in whom the post-operative finding was ileocaecal stricture. They were treated by resection and anastomosis in one cases and two cases by loop ileostomy. 8 patients were present with mass per abdomen comes with complains of obstruction having late presentation. Two patients were given conservative management in which one patient relieved. Out of rest 6 patients four were treated by resection and anastomosis and two patients were treated by loop ileostomy. On histopathology 10 patients had ulcerative and three patients have hyperplastic tuberculosis. One patient have peritonial tuberculosis.

Next important etiology was obstructed inguinal hernia. 4% patients present with obstructed inguinal hernia common in males in age group 40 - 60 years. Common symptoms were pain, vomiting and fever. Four patients present with symptoms of strangulation having gangrenous bowel loop on exploration and treated with resection and anastomosis. Eight patients were treated conservatively. Rest patients were treated by reduction of hernia. Most of cases were inflammatory in etiology.

Carcinoma of the bowel remains the next major cause of intestinal obstruction in 6.5% patients mainly present in old aged males presenting with symptoms of pain and distention of abdomen with altered bowel habits with other symptoms of bleeding per rectum, loss of weight and appetite with anaemia. Three of ten patients present with symptoms of obstruction in emergency treated with resection and anastomosis along with colostomy.

One presents with perforation treated with same management. Other five patients were treated by Abdomino-perineal resection after conservative management having growth 4 cm above anal verge with infiltration of sphincters. One patient treated by low anterior resection.

Most of the patients have growth at rectosigmoid junction. Histopath shows rectal carcinoma. Because bowel obstruction is often a terminal event in many of these patients and the recurrence and morbidity are high, decisions about management need to be individualized by carefully weighing risks, benefits, and life expectancy.

5% patient presents with symptoms of obstruction have volvulus on surgery.4% of them had caecal volvulus and 1% patient have small bowel volvulus mostly present in old age group.

Seven of them were relieved by laparomy and resection anastomosis and three of them treated by untwisting of the volvulus. Main symptoms were inability to pass flatus, pain and distention of the abdomen.

Histopath suggestive of inflammatory pathology. When present, volvulus is more frequently encountered in the geriatric population, in individuals with a long history of constipation, or in institutionalized or neurologically impaired or psychiatric patients. Colonic volvulus represents about 1 - 4% of all bowel obstructions and about 10 - 15% of all large bowel obstructions. Overall, sigmoid volvulus accounts for 75% of all patients with volvulus. In contrast, cecal volvulus is responsible for the majority of their maining 25% of bowel volvulae and is

the most common cause of large bowel obstruction in pregnancy.

Intussception is present in 2% patients as cause of obstruction. The age group was 60 - 70 years. There is a demonstrable inflammatory lesion in three cases and a neoplasm in fourth patient. They were treated by resection and anastomosis. Worm infestation as cause of obstruction present in two patients out of which both were treated by resection and anastomosis. Four patients present with adynamic obstruction in whom the pathology was inflammatory and they were managed conservatively.

In the present study, laparotomy with resection and anastomosis was the most common surgical procedure performed. Release of adhesion and bands were the second most common surgical procedure performed. All patients with adhesive obstruction were initially given a trial of conservative treatment, and this approach is recommended and adopted by many other authors in their trials by Zahra et al, Mehmood et al and Williams et al.[16-18]

The most common histopathological finding among the patients of intestinal obstruction was found to be inflammatory in 67% patients followed by tuberculosis in 29% and malignancy in 7% patients. The inflammatory pathology was found in 67 %, mostly in patients of adhesions. Malignancy is found in patients of carcinoma rectum presenting with features of obstruction. Tubercular pathology was found in most of the patients of ileal stricture. Tahir et al and Venugopal K et al also have the same findings in their study.[4,5]

CONCLUSION

In our study it had been observed that early diagnosis, adequate preoperative hydration, prompt investigations and early operative intervention improves survival in patients of intestinal obstruction. If preoperative preparation is improved and anesthetic management is more skillful, the mortality from abdominal exploration should approach minimum.

In our study the most common cause of intestinal Obstruction was adhesion and bands and least common cause was worm Infestation. Malignancy is also being one of the cause of intestinal obstruction. It has been find that average time of presentation of patient of obstruction was 3-5 days while most common operative procedure done in patient of obstruction was laparotomy with rescetion and anastomosis followed by release of adhesion and bands with pathology being mostly inflammatory and overall mortality being 8% in patients of intestinal obstruction.

In our study it has been also emphasized the importance of preoperative preparations, intravenous fluids, nutritional supplementation , blood investigation, X-ray and CT-SCAN for early and proper diagnosis and to prevent the development of peritonitis and systemic sepsis associated with multi-system organ failure and the operations required to relieve intestinal obstruction , so that patients can be treated conservatively.

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