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Evaluation and Management of Bowel Obstruction in Adults at Tertiary Health Care Center

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Abstract
Acute intestinal obstruction is a common surgical emergency and occurs in all age groups. 12% to 16% of acute abdominal emergencies may be contributed to intestinal obstruction. With its multiple etiology, intestinal obstruction of either the small or large bowel continues to be a major cause of morbidity and mortality. Early diagnosis of obstruction, skill full operative management, proper technique during surgery and intensive postoperative treatment carries a grateful result. Evaluation and management of bowel obstruction in adults at tertiary health care center Present study was carried out in the Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner. This is a prospective descriptive study and was carried out between December 2020 to November 2021. During the study period, 100 consecutive adult patients (Patients with 18 years and above 18 years of age) admitted with clinical and radiological evidence of acute dynamic intestinal obstruction, undergoing surgical intervention, regardless of gender were included. After obtaining permission from institution research board the present study was conducted data was collected from under study population through a pretested and semi-structured schedule. In our present prospective study most common age group of patients presented with intestinal obstruction was 51-60 years consisting of 29% patients. Mean age of our study population is 50.3 years. Out of 100 patients, 64 were males and 36 were females. Male to female ratio is 1.77:1. Out of total 100 patients 78 patients presented with small bowel obstruction and 22 patients presented with large bowel obstruction. External hernia (34%) is the commonest cause of Intestinal obstruction. Average hospital stay of patients in our study is 9.3 days. Wound infection, septicemia and wound dehiscence were most common complication. The overall survival rate and mortality rate in our study is 88% and 12%, respectively. Early diagnosis of obstruction, careful selection of cases for surgery, skillful operative management, proper technique during surgery and intensive post- operative treatment yields grateful results. Poor socioeconomic status, malnutrition, old age, delayed presentation of patients leading to delayed diagnosis and treatment, associated systemic co-morbid conditions adversely affects the final surgical outcome of the patients. Wound infection and wound dehiscence were the commonest postoperative complication noted in our study.

OPEN ACCESS

Key Words
Acute intestinal obstruction, exploratory laparotomy, wound dehiscence

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INTRODUCTION

Acute intestinal obstruction is a common surgical emergency and occurs in all age groups. In intestinal obstruction there is failure of passage of the intestinal contents[1].Bowel obstruction remains one of the most common intra-abdominal problems faced by general surgeons in their practice[2]. Intestinal obstruction may be dynamic or adynamic, complete or incomplete, strangulating or non-strangulating[3-4]. It is associated with significant morbidity and mortality, especially if it progresses to bowel ischemia.

Though intestinal obstruction can be diagnosed easily, the underlying cause except postoperative adhesions and external hernias are difficult to be diagnosed preoperatively[5] . Small bowel obstruction (SBO) is more common and a challenging clinical problem. The etiology of bowel obstruction has been varied with site, small bowel obstruction commonly caused by adhesion (60%) and large bowel obstruction is frequently a result of malignancy (60%) usually in area of recto-sigmoid. There are various other notable causes for both small and large bowel obstruction like strangulated hernias, fecal impaction, volvulus and anastomotic stricture etc[6-7] .

12% to 16% of acute abdominal emergencies may be contributed to intestinal obstruction. With its multiple etiology, intestinal obstruction of either the small or large bowel continues to be a major cause of morbidity and mortality[8] .

Cardinal features of Intestinal obstruction are abdominal pain, abdominal distension, Nausea and vomiting, relative /absolute constipation (obstipation), dehydration and fever. The past medical history of patient may key in making diagnosis and establishing the cause. Patients with intestinal obstruction are extremely ill and require prompt assessment and resuscitation. It requires quick and correct diagnosis as well as immediate, rational and effective therapy. Early diagnosis of obstruction, skill full operative management, proper technique during surgery and intensive postoperative treatment carries a grateful result. Untreated bowel obstruction or delay in diagnosis and treatment can lead to gangrene of bowel which will eventually result into sepsis, multi-organ failure and death of patient. Regional as well as worldwide variations in the patterns of intestinal obstruction are well documented in the literature. Periodic studies are needed to evaluate the etiological factors as well as changing pattern of disease[8] .

Aim of the present study is to determine the incidence, etiology, clinical presentation, post-operative complications and final outcome in patients with intestinal obstruction in our institution.

Aim and objective: Aim of the present study is Evaluation and management of bowel obstruction in adults at tertiary health care center''.

Materials and Methods

Present study was carried out in the Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner. This is a prospective descriptive study and was carried out between December 2020 to November 2021. During the study period, 100 consecutive adult patients (Patients with 18 years and above 18 years of age) admitted with clinical and radiological evidence of acute dynamic intestinal obstruction, undergoing surgical intervention, regardless of gender were included. After obtaining permission from institution research board the present study was conducted data was collected from under study population through a pretested and semi-structured schedule.

Inclusion criteria: Patients of age 18 years and above, regardless of gender, admitted with clinical and radiological evidence of acute intestinal obstruction and undergoing surgical intervention, enrolled in the study.

Exclusion criteria:

- Patients below 18 years of age.
- Patients with adynamic intestinal obstruction (paralytic ileus)
- Patients undergone conservative line of management.
- Patients not willing for surgical intervention and subsequently discharged AMA (discharged Against Medical Advice)

RESULTS AND DISCUSSIONS

In our present prospective study most common age group of patients presented with intestinal obstruction was 51-60 years consisting of 29% patients. Mean age of our study population is 50.3 years. Out of 100 patients, 64 were males and 36 were females. Male to female ratio is 1.77:1. Out of total 100 patients 78 patients presented with small bowel obstruction and 22 patients presented with large bowel obstruction. Out of 64 male patients, 47 had small bowel obstruction and remaining 17 had large bowel obstruction. Out of 36 female patients, 31 had small bowel obstruction and remaining 5 had large bowel obstruction.

In this present study abdominal pain was presenting symptom in most of the patients (96%), followed by abdominal distension (94%). Vomiting was present in (92%) patients and constipation was present in (78%) patients. Thus, abdominal pain and distension were the commonest symptoms detected at the time of presentation in our patients. Majority of patients presented to hospital between 3 to 4 days from the onset of symptoms.

External hernia (34%) is the commonest cause of Intestinal obstruction in our study followed by adhesions and bands (33%), malignancies (17%).

plain abdominal radiograph was done in all the patients and obstruction was detected in 68 patients in remaining 32 patients plain abdominal x-ray was inconclusive. Ultrasonography of abdomen was done in all 100 patients obstruction was detected in 75 patients, CT Scan of abdomen was done in 35 patients and ct scan was conclusive in all of 35 patients.

From above table it is evident that external hernia (34%) is the commonest cause of Intestinal obstruction in our study followed by adhesions and bands (33%), malignancies (17%).

From above table it is evident that external hernia is the commonest cause of small bowel obstruction in males and bands and adhesions were most common cause of small bowel obstruction in females.

Males were more commonly affected in patients presenting with large bowel obstruction in our study. Most common cause of large bowel obstruction detected in our patients was carcinoma of colon followed by volvulus.

In present study out of 34 cases of obstructed hernias 29 cases managed with reduction of hernias with respective repair, while remaining 5 cases managed with bowel resection and anastomosis with repair of hernia. Obstructive bands and adhesions were managed with division of bands and adhesiolysis respectively. 5 out of 17 cases of malignancy were managed with resection and anastomosis of segment involved with or without proximal diversion stoma. In 3 cases of malignancy only biopsy with ileostomy done and 8 cases were managed by biopsy with diversion colostomy and in 1 case inly biopsy was taken without any resection or diversion stoma.

From above table it evident that majority of patients in our study population had duration of hospital stay of 8-14 days and 0-7 days respectively. Average hospital stay of patients in our study is 9.3 days.

From above table it is evident that wound infection, septicemia and wound dehiscence were most common complication. Post-operative wound infection which was treated by daily dressing of the wound and IV antibiotics according to culture and sensitivity.

Out of 42 cases of small intestinal obstruction 39patients (78%) were survived and 3 patients (10%) were died. Out of 8 cases of large bowel obstruction 5 patients (10%) were survived and 3patients (6%) were died. Out of 50 patients, 44 patients' survived and 6 patients were died. The overall survival rate and mortality rate in our study is 88% and 12%, respectively.

A hospital based observational study conducted on 100 patients acute intestinal obstruction recruited through convenient sampling within study duration and eligible as per inclusion criteria reported to Department of Surgery, S.P. Medical College, PBM Hospital, Bikaner.

In this present prospective study youngest patient was 18 years old and oldest patient was 81 years. In this study, 29% patients belong to 51-60years age group and 17% belongs to 61-70 years age group. Study by Suvendu Shekhar Jena[9], has reported 35 % of cases of intestinal obstruction occur in the age group of 41-60 years. Study by B. kirubagran[10],has reported 41.11 % of cases of intestinal obstruction occur in the age group of >60 years and 34.44% of cases of intestinal obstruction occur in the age group of 41-60 years.

In our present prospective study mean age of patient is 44.44 years which is comparable to other studies. Study by Suvendu Shekhar Jena[9], has reported mean age of 50.1 years in cases of intestinal obstruction. Study by B. kirubagran[10], has reported mean age of 54.21 years in cases of intestinal obstruction.

In present study, there are 64 male and 36 females. Male to female ratio is 1.77:1. Among previous studies, Suvendu Shekhar Jena[9]. study, reported male to female ration of 1.36:1. The gender discrepancy in our patients with males outnumbering females can be possibly accounted for, as a large number of our patients had obstructed inguinal hernia, and in our country, we mostly have males who suffer from this condition.

In our study incidence of small bowel obstruction in our is study 78%. The incidence reported in other studies, 75.27% by Hadi A [76]. study, 85% by Malik AM study[15], 76% by Markogiannakis Het[22]. Incidence of small bowel obstruction in our study is comparable with other studies.

The incidence of large bowel obstruction in our study is 22%. The incidence reported in other studies, 24.73% by Hadi A study [16], 15% by Malik AM study[15], 68.88% by Ullah S[23]. study,24%. By Markogiannakis H study[22].

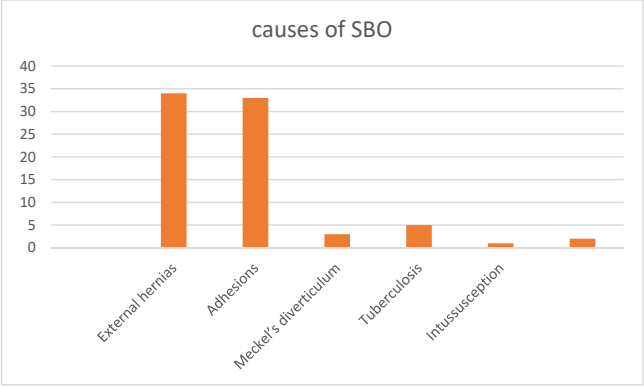

Fig 1: Causes of SBO

Table no.1: -Radiological investigations done in patients with intestinal obstruction

Radiological investigations done	Number of Patients	Obstruction detected	percentage
Plain Abdominal radiograph	100	68	68%
USG abdomen	100	75	75%
CT Scan abdomen	35	35	100%

Table no. 2: -Distribution of patients according to etiology of obstruction.

Sr. No.	CAUSES	Number of patients (n=100)	PERCENTAGE
1	External Hernias		
	a. Inguinal	19 34	34%
	b. Umbilical	4	
	c. Incisional	9	
	d. Femoral	2	
2	Adhesions and bands	33	33%
3	S M A Thrombosis	2	2%
4	Malignancies	17	17%
	a) Carcinoma of Caecum	1	
	b) Carcinoma of ascending colon	3	
	c) Carcinoma of descending colon.	5	
	d) Carcinoma of sigmoid colon	8	
5	Volvulus	5	5%
	a) Sigmoid colon volvulus	4	
	b) Splenic flexure volvulus	1	
6	Tuberculosis	5	5%
7	Intussusception	1	1%
8	Meckel's diverticulum	3	3%
	Total	100	100%

Table no. 3: -Distribution of patients according to the operative procedure performed.

Sr. No.	Operative procedure performed	Number of patients	Percentage
1	Reduction of hernia with herniorrhaphy	29	29%
2	Release of bands and adhesions	33	33%
3	Bowel resection and anastomosis	26	26%
4	Ileostomy with biopsy	3	3%
5	Diversion colostomy with biopsy	8	8%
6	Laparotomy done and only biopsy taken	1	1%

Table no. 4: Distribution of patients according to postoperative complications

Sr. No	Complications	Number of patients
1	Wound dehiscence /Burst abdomen	12
2.	Surgical site infection/ wound infection	13
3.	Paralytic ileus	8
4.	Pneumonia	6
5.	Septicemia	11
6.	Entero-cutaneous fistula	3
7.	Intra-abdominal or pelvic abscess	4
8.	Incisional hernia	6

Table no. 5: -Survival and mortality rate of patients of intestinal obstruction.

Type of Obstruction	patients Survived	Percentage	Patients died	Percentage
Small bowel obstruction (n=78)	72	(92.31%)	6	(7.69%)
Large bowel obstruction (n=22)	16	(72.72%)	6	(27.28%)
Total (n=100)	88	(88%)(Overall survival)	12	(12%)(Overall mortality)

The clinical presentation of patients having dynamic intestinal obstruction in our study is not different from those reported in other studies (B. kirubagran[10]. with colicky abdominal pain being common to all the patient.

The most common cause of intestinal obstruction in our present prospective study is obstructed or strangulated external hernias (34%) which included (inguinal, femoral, umbilical, Incisional) Second most common cause of intestinal obstruction in our study is Adhesions (33%). In Suvendu Shekhar Jena *et al* study 2021[9]. the most common cause of intestinal obstruction was adhesions (36.70%) followed by malignancy (17.5%). In Study by B. kirubagran[10]. the most common cause of intestinal obstruction was adhesions (26.67%).

In our present prospective study, the most common cause of intestinal obstruction is external hernias (34%). Similar finding is reported by other international are Jehangir *et al* study[24].Ohene-Yeoah M[27] . study (2001);Wysocki A *et al* study[28] .(1999). While adhesions as the most common cause of intestinal obstruction was reported by Markogiannakis *et al* study [22] . De la Garza-villasenor et al(29) study (2000) and Lawal et al study(30) (1994).

The average hospital stay of patients in our study is 9.3days which is comparable with study Suvendu Shekhar Jena [9] . with average duration of stay in hospital 9.6 days and Giannopoulos P[32].) with average duration of stay in hospital 10.4 days and lower than that reported by Chalya PL[33]. with average duration of stay in hospital 26 days.

The overall incidence of post-operative complications in our study is 38%. As compared to

other studies it is high, this may be because of small sample size in our study. Also, majority of patients in our study are old patients, many patients presented late to the hospital leading to delayed diagnosis and treatment.

Wound infection rate reported in our study is 12% while that reported 12% by Souvik Adhikari *et al* study 2008[11] . 10% by Bhange S.R.*et al* study[34].12% by Jahangir Sarwar khan *et al* study 2003[24] . is 10%, and 12% respectively. Wound infection rate is in our study is comparable with other study.

Incidence of burst abdomen inour study is 12%. It is higher than that reported in Souvik Adhikari *et al* study 2008[71] . is 4.4%; 2.3% by Bhange S.R.*et a*l study[34] 8% by Jahangir Sarwar khan 2003[14] .

Incidence of septicemia in our study is 11% while that reported in in 13% Souvik Adhikari *et al* study 2008[71]. 9% by Bhange S.R.*et al* study[34]. 4% by Jahangir sarwar khan *et al* study 2003[24] .

Incidence of enterocutaneous fistula in our study is 3% which is similar to that reported in Bhange S.R.*et al* study[34] and Jahangir sarwar khan *et al* study[24] . 2003.The incidence of other postoperative complications intra-abdominal abscess is 4%, 8% paralytic ileus and 6% incisional hernia.

Overall mortality rate in our study is 12%. As compared to studies like Suvendu Shekhar Jena[9]s, Baloch NA *et al* study[31] . 2009, Malik AM *et al* study[15] 2009,Souvik Adhikari et al study(11) 2008, Markogiannakis H *et al* study[22] 2002 the mortality rate is higher in our study this may be because of small sample size in our study. Also, most of our patients were from a poor socioeconomic status with a high prevalence of malnutrition, therefore, the morbidity and mortality are likely to be higher. Old age of the patients, delayed presentation of patients to the hospital leading to delayed diagnosis and treatment, associated systemic co-morbid conditions, led to a higher mortality rate in our study. Mortality rate in our study is comparable with Ohene-Yeboah M *et al* study 2001[27] and Lawal OO[30], *et al* study 1994.

At the turn of 20th century, hernias accounted for more than half of mechanical intestinal obstructions. A better understanding of the pathophysiology of bowel obstruction, use of isotonic fluid resuscitation, intestinal tube decompression and antibiotics have greatly reduced the mortality rate for patients with mechanical bowel obstruction. The pattern of dynamic intestinal obstruction has been reported to vary from one geographical area to another and different parts of the same country. The pattern of dynamic intestinal obstruction is also changing in developing country like India with increased awareness among the people and improved health care facilities especially in major capital cities. But the situation is still different in rural population of India, lack of awareness and financial constraints make many patients with intestinal obstruction present very late when situation is complicated. Similarly, poor follow up visits after discharge from hospitals remain a cause for concern.

CONCLUSION

Early diagnosis of obstruction, careful selection of cases for surgery, skillful operative management, proper technique during surgery and intensive post-operative treatment yields grateful results. Poor socioeconomic status, malnutrition, old age, delayed presentation of patients leading to delayed diagnosis and treatment, associated systemic co-morbid conditions adversely affects the final surgical outcome of the patients. Wound infection and wound dehiscence were the commonest postoperative complication noted in our study.

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