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Research Article

STUDY ON "SURGICAL MANAGEMENT IN DYNAMIC SMALL BOWEL OBSTRUCTION IN ADULT"

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ABSTRACT

Objectives: This study undergoes cases of dynamic small bowel obstruction in the adult population, requiring surgical intervention based on cause, anatomical and pathological nature, age-related factors, mode of presentation, investigation modalities, surgical procedure done, outcome after surgery, and complications.

Methods: The study was conducted on 100 small bowel obstructions from 2020 to 2022. 50 patients in each group requiring surgical intervention based on cause, anatomical, and pathological nature, age-related factors, mode of presentation, investigation modalities, surgical procedure done, and outcome after surgery and complications were analyzed.

Results: In the present study, the most common cause was adhesions and bands followed by hernia. In this study, 56% of the cases belonged to 31–50-year age group; there are 25 males and 25 females. On abdominal examination, diffuse tenderness was present in all 50 cases, followed by (muscle hold) guarding in 35, rigidity in eight, with mass abdomen including seven cases.

Conclusion: Intestinal obstruction is an important surgical emergency, demand vigorous correction of fluid, and electrolyte. Adhesions and bands are the common cause to produce intestinal obstruction. Patients with intestinal obstruction due to adhesions and bands are more likely to develop post-operative complications. Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multi-system organ failure.

Keywords: Intestinal obstruction, Dynamic small bowel obstruction, Adhesions.

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INTRODUCTION

Acute intestinal obstruction is one of the common surgical emergencies encounter to surgeon. Intestinal obstruction is reported in ancient literature and is defined as, "Interference in the passage of food, liquids, and contents of the intestine either due to mechanical or neurological cause." It is predisposed by various underlying conditions which are difficult to define preoperatively [1].

Acute intestinal obstruction can have many different causes, ranging from more common ones such as adhesions, hernias, and cancer to less common ones such as intussusception [2,3]. Even though the typical presentation is abdominal pain, vomiting, constipation, and distension, a thorough understanding of surgical anatomy, pathophysiology, obstruction symptoms and signs, and necessary investigations are required for a diagnosis [4]. The investigation modalities, age factors, mode of presentation, anatomical and pathological nature, surgical management, various complications, mortality, and outcome have all been examined in this study.

Aims and objectives

The aim of this study was to study cases of dynamic small bowel obstruction in adult population, requiring surgical intervention based on cause, anatomical and pathological nature, age-related factors, mode of presentation, investigation modalities, surgical procedure done, outcome after surgery, and complications.

METHODS

The materials for the clinical study of dynamic small bowel obstruction were collected from the cases admitted to various surgical wards in GMC Medical College Kota during the period from October 2022 to September 2023, after obtaining proper approval from the Institutional Ethical Committee. Fifty cases of dynamic small intestinal obstruction have been studied in a manner.

Pediatric age group is excluded in this study to avoid excessive stress on congenital anomalies. Patients who were having subacute intestinal obstruction treated conservatively, Paralytic ileus were excluded from the study. Case selection was done in the criteria of history, clinical examination, and radiological examination. Soon after the admission, clinical data were recorded according to the pro forma. The diagnosis is mainly based on clinical examination and is often supported by radiological examination. All the cases studied subjected to surgery and the diagnosis was established.

The investigations done in the cases for study were:

- Blood: Routine examination includes hemoglobin percentage, blood grouping and typing, white blood cell count and differential count, erythrocyte sedimentation rate, blood urea, serum creatinine, serum electrolytes.
- Urine: Routine examinations – albumin, sugar, and microscopy.

Radiology imaging

Abdomen plain X-rayed to measure gas and fluid levels. In every case, an abdomen ultrasound was performed. In some cases, an abdomen CT scan is performed. Resuscitation with IV fluids, particularly ringer lactate, and normal saline infusion began as soon as the patient was admitted and continued until their hydration and urine output returned to normal. Using a Ryles tube for nasogastric decompression, catheterization was performed, and antibiotic prophylaxis was initiated. Every bedside parameter, including heart rate, blood pressure, respiratory rate, abdominal circumference, bowel sounds, tenderness, and guarding, was closely monitored [5].

Individuals who demonstrated improvement in their overall health and reduction in abdominal distension, particularly those with post-operative adhesions, were given the option of conservative management, which involved continuing supportive treatment for an additional 12–24 h. However, patients who demonstrated improvement through bowel movement or a decrease in pain or tenderness after receiving conservative treatment were not included in this study.

Following resuscitation, patients exhibiting distinct indications and symptoms of acute obstruction were treated with the appropriate surgical procedure. Surgery was chosen, and the selection criteria were recorded. When necessary, a histopathological examination of the resection or biopsy specimen was conducted.

The post-operative period was monitored carefully and all parameters were recorded hourly or fourth an hourly basis depending on the patient's general condition and toxemia.

Routine intermittent oxygen inhalation was instituted in patients having strangulation of the bowel to reduce the damage induced by ischemia.

Post-operative follow-up after the discharge of patients was done in the majority of the patients up to 6 months. Most of the patients did not come for follow-up after one or two visits.

The age, sex, symptoms, examination results, investigations, abnormalities, likely causative factors, operative findings, chosen operative technique, and complications noted are the main points that are highlighted in the tabulated results.

Statistical analysis

In this study, descriptive statistical analysis has been done. The results of categorical measurements are presented in number (%), while the results of continuous measurements are displayed as mean±SD (Min-Max). At the 5% significance level, significance is evaluated. The following data-related assumptions are made as follows: (1) Dependent variables must have a normal distribution; (2) random samples taken from the population; and (3) sample cases must be independent. Fisher/Chi-square: The significance of study parameters on a categorical scale between two or more groups has been determined using an exact test.

RESULTS

The study of 50 cases of dynamic small intestinal obstruction in adults during October 2020–September 2022 at GMC Medical College, Kota, studied is as follows:

Study design

To investigate surgical management, a prospective single-group study involving 50 patients who presented with dynamic small bowel obstruction in adults was conducted (Figs. 1 and 2).

In the present study, out of 50 cases of small bowel obstruction, 40% of patients had a previous history of abdominal surgeries resulting in post-operative adhesions/bands (Table 1).

On examination of the abdomen, diffuse tenderness was present in all 50 cases, followed by (muscle hold) guarding in 35. Rigidity in eight cases with mass abdomen includes 7 cases (Table 2).

DISCUSSION

Brewer *et al*. analyzed 1000 consecutive abdominal surgeries in 1976 and reported an incidence of 2.5%. The involvement of small bowel in obstruction is much more common than that of large bowel. The delay in the treatment will lead to high mortality [6].

Since the advancement in understanding the anatomy, physiology, fluid, and electrolyte management, along with modern antibiotics and intensive care units, the mortality has been decreasing consistently. The associated medical problems (like respiratory cardiac or metabolic diseases) and advanced age carry a considerable contribution in adding the mortality.

Fig. 1: Distribution of the abdomen due to small bowel obstruction

Fig. 2: Obstructed incisional hernia

Although intestinal obstruction occurs in all age groups, here the youngest patient was 18 years and the oldest patient was 80 years. In this study, 56% of the cases belong to 31–50 years age group. Studies by Gill Eggleston have reported that 60% of the cases of intestinal obstruction occur in the age group of 30–60 years [7].

In the present study, there are 25 males and 25 females. Male and female are in equal ratio. In the study by Naveen *et al*., more incidence of males was equal as compared to females [8].

In the present study, the most common cause is adhesions and bands followed by hernia (Figs. 3 and 4).

The comparative study of the previous is as follows:

Etiology	Present study (%)	Tiddle[9] (%)	Brooks and Buttler[10] (%)
Adhesions and bands	68	53	23
Hernia	12	26	25
Tuberculosis	10	-	-
Malignancy	6	-	7
Intussusception	2	-	16
Volvulus	2	3	1

In the present series, 68% of the cases of obstruction are due to adhesions and bands, out of which 40% are due to post-operative

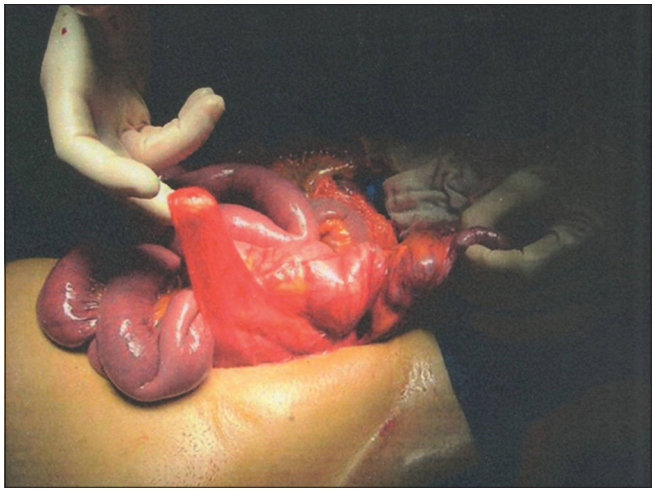


Fig. 3: Intraoperative pic of fibrous band causing small bowel obstruction

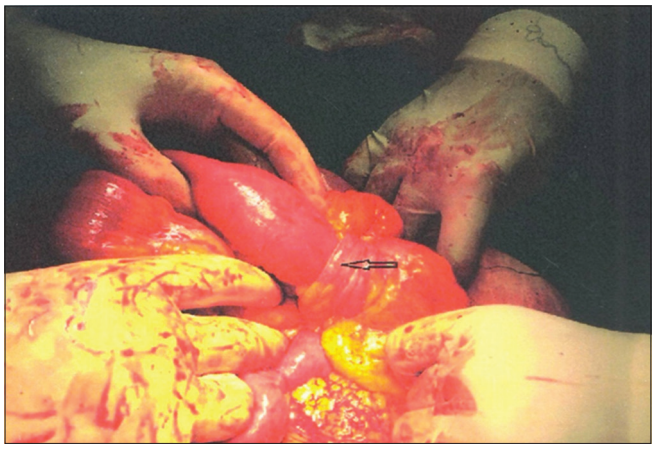
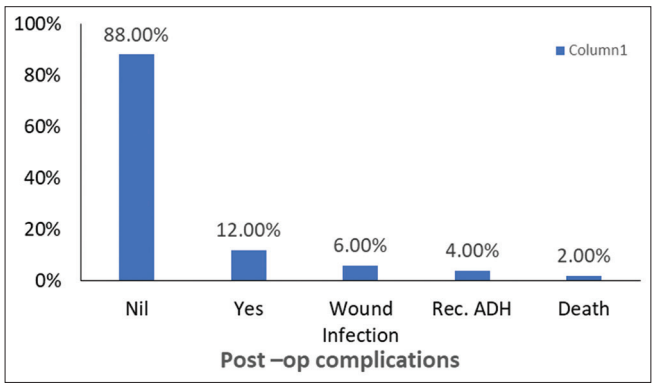


Fig. 4: Intraoperative pic of intussusception causing obstruction



Graph 1: Post-operative complications

adhesions whereas in study of Tiddle, it is 53% which is low, and in Brooks and Buttler study, it is 23% which is very low as compared to our study [9,10]. In the present series, 12% of cases of obstruction are related to hernia but in study of Tiddle [9] and Brooks and Buttler [10], it is 26% and 25%, respectively, which are nearly double.

There were four cases of female obstructed incisional hernias and one each of male and female obstructed inguinal hernias.

Table 1: Clinical characteristics and duration of symptoms

Parameters	Number of patients (n=50)	%
Clinical characteristics		
Pain	50	100.0
Vomiting	25	50.0
Distension	20	40.0
Constipation	18	36.0
Irreducible hernia	5	10.0
Fever	10	20.0
Dehydration	14	28.0
Duration of symptoms		
1–2 days	12	24.0
2–5 days	34	68.0
6–14 days	2	4.0
15 and above	2	4.0
H/O previous surgery	20	40.0

Table 2: Tender/guarding/rigidity/mass

Parameters	Number of patients (n=50)	%
Tender	50	100.0
Guarding/Muscle hold	35	70.0
Rigidity	8	16.0
Mass	7	14.0

Table 3: Etiology

Etiology	Number of patients (n=50)	%
Adhesions and bands	34	68.0
Hernia	6	12.0
Tuberculosis	5	10.0
Malignancy	3	6.0
Intussusception	1	2.0
Volvulus	1	2.0
Total	50	100

Table 4: Type of operation

Operation	Number of patients (n=50)	%
Laparotomy and resection anastomosis	19	38.0
Laparotomy and release of adhesions	14	28.0
Laparoscopic adhesiolysis	2	4.0
Laparotomy and ileostomy	8	16.0
Laparotomy and hernioplasty/reduction	6	12.0
Laparotomy and untwisting of volvulus	1	2.0

The comparative analysis of the incidence of various studies reported the incidence from 13 to 35%. However, hernia-related obstruction was higher in the earlier period (60–70's) due to early surgical treatment for hernia; the incidence decreased from 40% to 20%.

Tuberculosis is one of the common health problems in developing countries. In the present series, tuberculosis was found to be a causative factor in 10% of causes in the form of iliocecal tuberculosis with stricture and adhesions (Table 3).

Disparity with Western literature is due to the increase in a number of tuberculosis patients in developing countries like India. However, in the study of Tiddle [9] and Brooks and Buttler [10], no cases of obstruction by tuberculosis were reported may be due to the developed country.

Brooks and Buttler reported an incidence of 7% of small bowel obstruction due to malignancy [10]. No case was reported in Tiddle in

the present study and 6% of cases presented with acute small bowel obstruction from malignancy [9]. The incidence is higher in western countries due to various factors, which includes increased aged population, consumption of high animal fat, and lack of fiber diet.

Intussusception is generally regarded as a disease almost exclusively of infants and is rare in adults. In our study, intussusception contributes about 2% of small bowel obstruction, and study of Tiddle no cases reported, whereas in the study of Brooks and Buttler, it is 16%, which is quite high as compared to our study [9,10].

The total percentage of volvulus in our study is 2%. Small bowel volvulus is a rare but life-threatening surgical emergency. In Tiddle, it is 3% and in Brooks and Buttler, it is 1%, which is nearly similar to our study [9,10].

The etiology may be primary where the cause is not known and secondary due to adhesions and bands (Table 4). Iwuagwu and Deans 1999 reported an incidence of 3.5–6.2% [11].

Operation	Present study (%)	Tiddle [9]	Brook and Butler [10]
Laparotomy and resection anastomosis	38	25	14
Laparotomy and release of adhesions	28	28	10
Laparoscopic adhesiolysis	4	-	-
Laparotomy and ileostomy	16	18	20
Laparotomy and hernioplasty/reduction	12	20	22
Laparotomy and Untwisting of volvulus	2	4	-

All the cases of our study were subjected to surgery. The most common operation performed was laparotomy and resection anastomosis 38%; in Tiddle, it is quite low 25%; and in Brooks and Buttler, it is much lower (14%) nearly 3 times as compared to the present study [9,10]. Release of adhesions and bands was done in 28% cases of the present study which is nearly similar to Tiddle study 28% but it was low in Brooks and Buttler study, it is 10% which is 2.8 times lower than our study [9,10]. Laparoscopic adhesiolysis was done in 4% of cases of the present study but in both studies, Tiddle and Brooks and Buttler, no cases were treated by laparoscopic adhesiolysis [9,10]. 16% ileostomy was done in the present study which is nearly equal to both the study which is 18% in Tiddle and 20% in Brooks and Buttler study [9,10]. Reduction and hernia repair in 12% cases of the present study which is low as compared to both studies in Lee *et al*. it is 20% and in Sukhlecha, it is 22%; in both studies, it is by hernioplasty and it is much higher than our present study [12,13]. Untwisting of volvulus was done in 2% of the present study which is more in Lee *et al*. study 4% and no untwisting done in Sukhlecha study [12,13].

Postoperatively IV fluids and nasogastric decompression and antibiotics were given until good bowel movements appeared.

The incidence of post-operative complications in our study was wound infection (5 cases), recurrent adhesions (2 cases), and one case of death (Graph 1).

CONCLUSION

Intestinal obstruction still remains an important surgical emergency. Adhesions and bands are the common cause to produce intestinal obstruction. Patients with intestinal obstruction due to adhesions and band are more likely to develop post-operative complications. Early operation is mandatory to avoid the development of peritonitis and systemic sepsis associated with multi-system organ failure. The reduction in post-operative morbidity associated with laparoscopic surgical techniques has led to their widespread use for adhesiolysis.

AUTHORS CONTRIBUTION

All authors contributed equally.

CONFLICTS OF INTERESTS

NONE.

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