Causes and Complications of Intestinal Obstruction

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ABSTRACT

Objective — *To determine the causes and complications of surgery in patients presenting with intestinal obstruction.*

Study design — *Cross-sectional observational study.*

Place & Duration of study — *Department of General Surgery Ward-II, Jinnah Postgraduate Medical Center (JPMC) Karachi, from January 2023 to February 2024.*

Methods — *All patients diagnosed as having intestinal obstruction on clinical grounds and operated, were included in the study. Patients with intestinal obstruction, who were treated conservatively, were excluded as were those who had peritonitis at laparotomy without obstruction. Operative findings and histopathological findings were recorded. Data were presented as frequency and percentages with the confidence interval.*

Results — *A total of 97 patients were included. There were 47 (48.4%) males and 50 (51.6%) females. The age of the patients was from 13 years to 80 years. The common causes of intestinal obstruction were tuberculosis (n=28 - 28.86%), adhesions (n= 22 - 22.68%), and rectal carcinoma (n=13 - 13.4%). Six (6.18%) patients developed complications of whom two (2.06%) expired. Complications included wound infection (n=2 - 2.06%), wound dehiscence (n=1 - 1.03%), and burst abdomen (n=1 - 1.03%).*

Conclusion — *The leading cause of intestinal obstruction was tuberculosis followed by bowel adhesions. Complications were infrequent. However, there was a definite morbidity and mortality associated with the intestinal obstruction.*

Key words — *Tuberculosis, Adhesions, Obstructed hernia, Carcinoma colon, Intestinal obstruction, Burst abdomen.*

INTRODUCTION:

Mechanical intestinal obstruction usually presents with colicky abdominal pain, vomiting, and distension. Diagnosis is usually clinical and can be confirmed by x-ray abdomen. In obstruction of the large bowel the symptoms are slightly different and constipation is frequently reported with failure to pass flatus in some cases. Intestinal obstruction can result in perforation leading to peritonitis. The strangulation and gangrene occur in cases of obstructed hernia. Septicemia as a result of these events can cause multi-organ failure leading to death.[1]

The causes of intestinal obstruction as reported in literature varies in different geographical locations. Adhesions are commonly reported and different measures are advised at primary surgery to minimize them.[2] Tuberculosis of intestine is an important cause of obstruction in lower-middle income countries. The diagnosis of tuberculosis is difficult. However, a high index of suspicion should be exercised in endemic regions.[3,4] The incidence of tuberculosis is increasing by 3.6% from 2020 to 2021.[5] Large gut obstruction is usually due to the colorectal carcinoma that occurs

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at an advanced stage of the disease.[6] This study was conducted to find out the causes and complications of surgery in patients presenting with the intestinal obstruction. This study adds to the literature an evidence based data from low-middle-income-countries (LMIC).

METHODS:

Study design, place & duration: This cross-sectional observational study was conducted in the Department of Surgery, Ward-II, Jinnah Postgraduate Medical Center Karachi, From January 2023 to February 2024.

Ethical considerations: The study was approved by the Institution Review Board letter NO.F.2-80/2024-GENL/213/JPMC dated 30-01-2023. Informed consent was taken from the study participants.

Inclusion and exclusion criteria: All patients diagnosed with intestinal obstruction on clinical assessment who underwent surgery, were included. Patients provisionally diagnosed with intestinal obstruction in whom operative findings revealed peritonitis were excluded. Patients with paralytic ileus were also not enrolled.

Sample size calculations: A sample size of 97 from a population of 120 achieves 80.179% power to detect a difference (P1-P0) of 0.0500 using a two-sided exact test with a significance level (alpha) of 0.050. These results assume that the population proportion under the null hypothesis (P0) is 0.2000.[7]

Study protocol: All patients who presented with abdominal pain, vomiting, and absolute constipation were examined for presence of abdominal distension and investigated for presence of intestinal obstruction. X-ray abdomen was done in the emergency department. Patients with multiple air-fluid levels and dilated gut were diagnosed provisionally as having intestinal obstruction. All patients were resuscitated in the emergency department and essential baseline investigations were sent for further management. This included complete blood count, random blood sugar level, hepatitis-B, hepatitis-C profile, x-ray chest, and if needed, electrocardiography. Exploratory laparotomy was performed after anesthesia consult. Operative findings were recorded on a pre designed form. Surgical procedure was tailored according to the cause of the intestinal obstruction. Biopsy was taken where deemed necessary. Histopathological reports were traced for making a final diagnosis. Postoperative care was provided as per standard protocol. Postoperative complications were also noted.

Statistical analysis: The data were entered and results analyzed by SPSS version 27. The numerical variable like age was reported as mean ±SD. For the categorical variables namely the frequency of causes and complications data were presented as number and percentages. Confidence interval was also calculated.

RESULTS:

A total of 97 patients with intestinal obstruction were included. Majority of the patients were males (n=47 - 48.4%). The age of the patients was from 13 years to 80 years. The mean age was 46±10 years. The causes of intestinal obstruction are listed in table I. The most common cause of the intestinal obstruction was tuberculosis followed by bowel adhesions. Together they constituted more than 50% (n=50) of the cases. Different carcinomas (n=22) were also an important cause of the intestinal obstruction.

Six (6.18%) patients in this study developed complications. This included wound infection (n=2-2.06%), and one (1.03%) each of wound dehiscence, intestinal perforation causing peritonitis and burst abdomen. Two (2.06%) patients expired during the hospital course.

DISCUSSION:

In this study from a lower-middle-income-country intestinal tuberculosis was the most common cause of intestinal obstruction. It constituted 28.66% of the causes which is different from other study where abdominal tuberculosis was reported in only 0.2% of cases. Bowel strictures were found in 25% of the patients but obstruction was reported infrequently.[8] This highlights the need of the steps taken as a public health measures to control this condition. It is usually associated with pulmonary tuberculosis. Intestinal tuberculosis is commonly reported from other regional Asian countries as well and results in stricture like that found in the Crohn's disease.[9] As mentioned, all strictures may not cause intestinal obstruction.[10]

In about 50% - 90% of the patients with ileocecal tuberculosis intestinal obstruction may occur. Ulcerative intestinal tuberculosis usually does not cause obstruction on its own but with the presence of stricture this complication may occur.[11] Another important cause of intestinal obstruction could be hypertrophic type of intestinal tuberculosis. Intestinal obstruction can occur in patients with

Table I: Causes of Intestinal Obstruction (n=97)

Causes	Frequency (n)	Percentage	Confidence Interval
Tuberculosis	28	28.86%	20.51 – 38.46
Adhesions	22	22.68%	15.17 – 31.80
Rectal carcinoma	13	13.40%	7.66 – 21.30
Obstructed hernia	10	10.30%	5.35 – 17.60
Bands	04	4.12%	1.32 – 9.64
Sigmoid volvulus	04	4.12%	1.32 – 9.64
Small bowel adenocarcinoma	04	4.12%	1.32 – 9.64
Sigmoid carcinoma	03	3.09%	0.79 – 8.18
Descending colon carcinoma	02	2.06%	0.34 – 6.64
Meckel's diverticulum	02	2.06%	0.34 – 6.64
Metastasis	02	2.06%	0.34 – 6.64
Hirschsprung's disease	01	1.03%	0.05 – 5.04
Intussusception	01	1.03%	0.05 – 5.04
Transverse colon carcinoma	01	1.03%	0.05 – 5.04

peritoneal tuberculosis because of formation of adhesions that may result in the formation of the abdominal cocoon.[12]

Adhesion between bowel loops is the most common cause of intestinal obstruction in Western countries. This usually results in small bowel obstruction. This is difficult to differentiate clinically from other causes.[13] Computed tomography scan can help in making a diagnosis of this condition. However, in this study it was the second leading cause of intestinal obstruction.

In other studies, similar results were reported.[14] The most common risk factors for abdominal adhesion are the type of pathology, anatomical location and the techniques used during the previous surgery. Adhesions are most commonly reported in lower abdomen and pelvic surgeries and usually occur after 1-2 years. Adhesions are reported following appendectomy and gynecological surgeries. Adhesions are less common in laparoscopic surgery. During any surgery minimal and gentle handling of the tissues must be done in order to avoid damage to the peritoneum. Antifibrotic, anti-inflammatory, and fibrinolytic agents can be used to prevent the adhesions formation.

Colorectal carcinoma is also the common cause of intestinal obstruction. Most commonly rectosigmoid region is involved. This was a major cause of obstruction in one of the studies where it accounted for 61% of the cases.[15] In this study overall obstruction due to colorectal carcinoma was found in about 20% cases. Obstructed external hernias can result in infarction and gangrene of the gut within six hours.[16] In this study strangulation was very rare and occurred only in one patient. This may be due to early surgical intervention. in these patients. Number of rare cases in adolescent and other age groups were also found in this study.[17]

Limitations of the study: It was a small sample size and single-centered study, so further studies are needed to provide a more robust data on the subject.

CONCLUSION:

The most common cause of intestinal obstruction was tuberculosis which is an infectious disease followed by the adhesions between bowel loops. All the carcinomas of intestinal tract combined also found as a leading cause of the obstruction. Two patients expired during the postoperative course signifying mortality associated with this condition.

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