

PATTERNS OF INTESTINAL OBSTRUCTION IN ADULTS: ETIOLOGY, MANAGEMENT, AND OUTCOMES AT LADY READING HOSPITAL PESHAWAR

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ABSTRACT

Objective: To determine the etiological spectrum, management modalities and clinical outcome of intestinal obstruction in the adults who underwent surgery for intestinal obstruction at a tertiary-care surgical unit.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: Department of General Surgery, Lady Reading Hospital Peshawar, Pakistan.

Methodology: A total of 120 adult patients (aged 18 years or older) were admitted with a diagnosis of intestinal obstruction and were enrolled in a consecutive manner. Each patient was assessed through a detailed clinical history, clinical examination and followed up clinical examination until the end of the study, along with the results of radiological investigations, intra-operative findings and surgeries performed, post-operative findings and the final outcome. This information was captured using a structured proforma. The patients were treated either conservatively or surgically depending on their clinical status. The analysis of the data was performed in SPSS version 26.

Results: The mean age was 42.3 ± 14.6 years with a male predominance (65.0%). The most common cause was post-operative adhesions (31.7%) followed by obstructed or strangulated hernia (21.7%), intestinal tuberculosis (18.3%) colorectal malignancy (15.0%) and volvulus (8.3%). Of those, 76.7% (92 patients) required surgical management, with the most frequently performed surgeries being adhesiolysis (32.6%) and resection with anastomosis (26.1%). The total complication rate of patients undergoing surgery was 40.2%, and the mortality rate was 5.8%.

Conclusions: Post-operative adhesion and external hernia continue to be the common causes of intestinal obstruction at this tertiary centre. Time of presentation is a major factor in determining morbidity and mortality and surgical intervention is essential in achieving optimized outcomes within a timely manner.

Keywords: Intestinal obstruction, Mechanical bowel obstruction, Post-operative adhesions, Hernia, Intestinal tuberculosis, Surgical outcome

INTRODUCTION

Intestinal obstruction is a common potentially life threatening surgical emergency all over the world including the developed and developing world and is responsible for a considerable number of emergency admissions and operations in the general surgical practice [1,2]. It may be caused by any anatomical or functional disturbance of the normal aboral passage of the bowel contents, the pathophysiological changes of the condition ranging from disturbances in fluid and electrolyte balance to proximal bowel dilatation, bacterial translocation, ischaemia, perforation and frank sepsis if the obstruction is not identified and relieved early [1,3]. The clinical spectrum is wide, with variable obstruction from partial to complete involving both the small bowel and the large bowel and with a varying etiology according to location, patient demographics and rates of previous abdominal surgery [2,4]. In high income countries, this has led to the intraperitoneal adhesions being the main culprit of small bowel obstruction, whereas, in low and middle income countries, external hernia, sigmoid volvulus and abdominal tuberculosis remain large contributors to small bowel obstruction because of their endemic nature and delayed presentation and limited access to elective hernia repair [3,5,6]. Tabled statistics consistently bear out that adhesion, hernia, and intestinal tuberculosis are the most common causes of mechanical intestinal obstruction and colorectal malignancy is a constantly emerging cause in the older age group in Pakistan [7,8]. Adhesions (31.82%), intestinal tuberculosis (21.82%) and obstructed hernia (14.55%) were the top three aetiologies in an investigation of 110 consecutive surgical patients at Lady Reading Hospital Peshawar [9] consistent with other surgical series in this region at Ayub Teaching Hospital Abbottabad [7] as well as in Karachi and Lahore [10].

The mortality rates after intestinal obstruction are still quite high in Pakistan and neighbouring countries as compared to Western series; this is mainly because in these countries the patients are late for presentation even after 48 hours when bowel viability becomes questionable and systemic inflammatory response has been initiated [6,9,11]. When making the decision to either be conservative with nasogastric decompression, fluid resuscitation and the gradual reintroduction of the nasogastric tube or early operative intervention, one must consider the level and completeness of the obstruction, etiology suspected, strangulation signs present or absent and the general physiological status of the patient [1,2]. Although the evidence now available is contemporary, it agrees that if there are no features of strangulation, and a carefully monitored trial of non-operative management is undertaken in selected patients, this is safe to do, however a delay of more than 48 hours without clinical improvement is associated with a significant increase in morbidity [12].

There is a lack of complete up-to-date data about the etiological distribution, management and short-term outcome of intestinal obstruction despite its high surgical burden in high volume public tertiary care hospital, serving the population of Khyber Pakhtunkhwa and neighboring tribal districts. This study was therefore conducted to describe the profile of intestinal obstruction in adults in the surgical unit of Lady Reading Hospital Peshawar with regard to etiology, site of obstruction, mode of management, complications and outcomes of surgery.

MATERIALS AND METHODS

Study Design and Setting

This study is descriptive cross-sectional which was conducted in Department of General Surgery, Lady Reading Hospital Medical Teaching Institute (LRH-MTI), Peshawar.

Sample Size and Sampling Technique

A non-probability consecutive sampling technique was used. All the adult population (aged 18 years and above), having a clinical and radiological diagnosis of intestinal obstruction admitted during the period was included until 120 patients were obtained in the study period which was similar to the sample size used in similar study in the region [7, 9].

Inclusion Criteria

- Adult patients 18 years of age and older – both male and female
- Mechanical or adynamic intestinal obstruction on clinical and radiological basis (plain abdominal radiograph and/or computed tomography)
- Ability to provide information in English if a translator is required for the assessment process.

Exclusion Criteria

- Post-operative ileus within 72 of an abdominal procedure
- Cannula size > 4mm

Data Collection

A structured proforma was used to document baseline demographic data and duration of symptoms before presentation, clinical signs, laboratory and imaging findings, level and type of obstruction, findings of surgery, surgery performed, post-operative complications, duration of hospital stay and outcome at the time of discharge, after ethical approval and informed consent. Based on the usual surgical criteria, complications were defined and assessed. Mortality was defined as death during the hospital stay on the index incident.

Statistical Analysis

IBM SPSS version 26 was used for data entry and data analysis. Frequencies and percentages were used for categorical variables, and mean \pm standard deviation for continuous variables. Statistically significant results were accepted as a p-value <0.05.

RESULTS

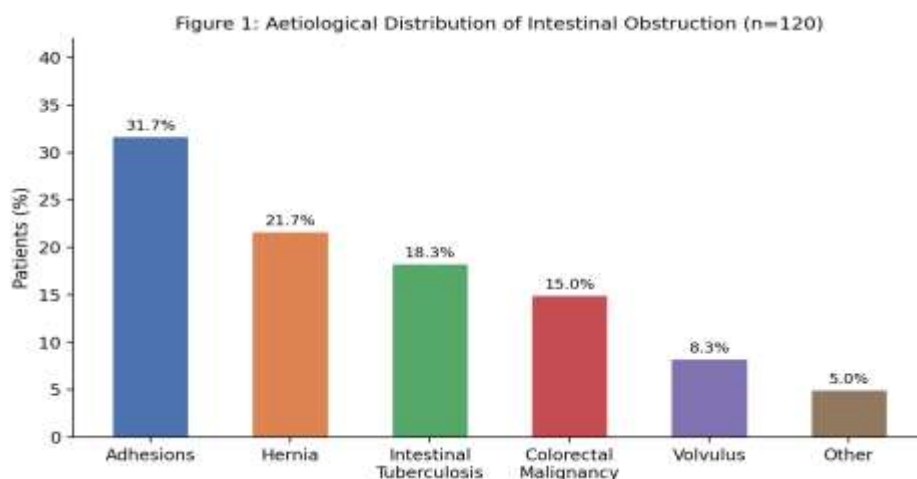
The number of adult patients with intestinal obstruction in the study, who were recruited over 6 months, was 120. The mean age was 42.3 ± 14.6 years (range 18–78 years), with the majority of patients (48.3%) falling in the 31–50 year age group. Male outnumbered the female population with 78 (65.0%) and 42 (35.0%) patients respectively, giving the ratio of males to females as 1.86:1. A significant number stayed for a while before arriving to hospital, with 54 (45.0%) patients presenting between 25 and 72 hours after onset of symptoms and 34 (28.3%) after 72 hours. A total of 74 cases (61.7%) were small bowel obstruction and 46 cases (38.3%) were large bowel obstruction (Table 1).

Etiological analysis showed that adhesion as a complication of surgery was the most common cause of intestinal obstruction being seen in 38 patients (31.7%) followed by obstructed/strangulated external hernia in 26 patients

(21.7%), intestinal tuberculosis (IBT) in 22 patients (18.3%), colorectal malignancy (CRC) in 18 patients (15.0%), sigmoid volvulus in 10 patients (8.3%) and miscellaneous causes in 6 patients (5.0%). This etiological spectrum is listed in Table 1 and graphed in Fig.1.

Table 1: Baseline Demographic, Clinical and Etiological Characteristics of Study Participants (n=120)

Variable	Category	n (%)	Mean ± SD
Age (years)	Range 18–78	—	42.3 ± 14.6
	18–30	24 (20.0%)	—
	31–50	58 (48.3%)	—
	>50	38 (31.7%)	—
Sex	Male	78 (65.0%)	—
	Female	42 (35.0%)	—
Duration of symptoms at presentation	≤24 hours	32 (26.7%)	—
	25–72 hours	54 (45.0%)	—
	>72 hours	34 (28.3%)	—
Level of obstruction	Small bowel	74 (61.7%)	—
	Large bowel	46 (38.3%)	—
Etiology	Post-operative adhesions	38 (31.7%)	—
	Obstructed / strangulated hernia	26 (21.7%)	—
	Intestinal tuberculosis	22 (18.3%)	—
	Colorectal malignancy	18 (15.0%)	—
	Volvulus	10 (8.3%)	—
	Other	6 (5.0%)	—



journal: Pak J Med Health Sci, 28 patients (23.3%) were managed conservatively with nasogastric decompression, intravenous fluid resuscitation and close observation of clinical conditions, and they all recovered well without surgery. In 92 cases (76.7%) a surgical exploration was needed. Of all surgical cases, the most commonly performed procedure was adhesiolysis in 30 patients (32.6%), followed by resection and anastomosis in 24 (26.1%), herniorrhaphy/tension free mesh repair in 22 (23.9%), Hartmann's procedure/end colostomy in 12

(13.0%) and other procedures in 4 (4.3%). Surgical site infection was the most frequent post-operative complication in the 37 surgical patients who had a post-operative complication, 14 (15.2%) had an infection, 8 (8.7%) had sepsis, 6 (6.5%) had wound dehiscence, 5 (5.4%) had pulmonary complications, and 4 (4.3%) had an anastomotic leak. The mean hospital stay for the entire cohort was 8.4 ± 3.7 days, 4.6 ± 1.8 days in the conservative cohort and 9.8 ± 3.4 days in the surgical cohort. Seven patients died on the index admission (overall mortality rate of 5.8%) and all deaths were found in the surgical group of patients and linked to systemic sepsis, strangulation, and presentation at a later stage (Table 2).

Table 2: Management Modalities, Post-operative Complications and Outcomes (n=120)

Parameter	n / Value	%	
Management approach	Conservative	28 (23.3%)	
	Surgical	92 (76.7%)	
Surgical procedure (of 92 operative cases)	Adhesiolysis	30 (32.6%)	
	Herniorrhaphy / mesh repair	22 (23.9%)	
	Resection and anastomosis	24 (26.1%)	
	Hartmann's procedure / colostomy	12 (13.0%)	
	Other	4 (4.3%)	
Post-operative complications (n=92)	Surgical site infection	14 (15.2%)	
	Sepsis	8 (8.7%)	
	Anastomotic leak	4 (4.3%)	
	Wound dehiscence	6 (6.5%)	
	Pulmonary complication	5 (5.4%)	
Mean hospital stay (days)	Overall: 8.4 ± 3.7		
	Conservative group: 4.6 ± 1.8		
	Surgical group: 9.8 ± 3.4		
Overall mortality	7 patients	5.8%	

DISCUSSION

The predominance of post-operative adhesions as the leading etiology in intestinal obstruction series (31.7%) similar to the series reported from other countries in South Asia and Pakistan. Malik et al. also found that adhesion was the most common in a multicentre series in Pakistan; in neighbouring countries, this finding was also seen in the clinico-pathology series [4,7]. Heavily loaded adhesion burden in the current cohort might be explained by the rise in the number of abdominal surgical procedures performed at this institution over the previous decade including appendicectomy, obstetric and gynaecological surgery, as well as open surgery for colonic resection, all of which are well established to be associated with adhesion formation, and subsequent adhesion obstruction risk [12,13].

The second most common etiology was obstructed/strangulated hernia (21.7%), which was in line with the data from LRH Peshawar where hernia was seen in 13.9% cases and from Ayub Teaching Hospital Abbottabad (21.7% cases) where hernia was a most common cause of mechanical obstruction [9,10]. Poor uptake in elective hernia repair in the public sector outpatient facilities, delayed health-seeking behaviour, and the high prevalence of risk factors, including frequent straining, heavy manual load and low nutritional status, in the predominantly rural referral catchment area in this hospital [9] all contribute to the continuation of the burden of hernia.

Intestinal tuberculosis (18.3%) become third most common cause which is more than reported in large series from India [4] but agrees with the endemicity of tuberculosis in Khyber Pakhtunkhwa where the presence of pulmonary and extrapulmonary tuberculosis is still a public health concern and abdominal tuberculosis as a stricture and as ileocaecal disease is clinically important [7,8]. In 15.0% the obstruction was caused by colorectal malignancy which is in line with the recently extended recognition of large bowel malignancy as an obstruction-causing tumour in older Pakistani patients due to changing dietary habits and diagnostic capabilities [9].

The need for surgery was 76.7% which is similar to the high surgical rate of 77% found in Ethiopian series and 73–80% in regional Asian studies [2,6]. The total complication rate of 40.2% of surgical patients, although significantly higher than some West Series, may reflect results from other similarly resourced tertiary centres in which factors such as delayed presentation, poor nutritional status and the presence of co-morbid diseases such as uncontrolled diabetes have a role to play in wound healing and systemic recovery [5,6]. Surgical site infection (15.2%) was the most common complication, as reported in other studies from Pakistan and the rest of the South Asian region in emergency laparotomy series [9,11]. The 4.3% leak-rate is considered to be in the tolerable range for emergency bowel surgery in contaminated fields [1].

The overall mortality rate for this series was 5.8% which is better than the 7.1% reported in an Ethiopian referral hospital series [6] but is worse than modern day reported figures from a well-resourced hospital where mortality rate for intestinal obstruction can be reduced to below 3% with early diagnosis and timely surgery [1,12]. Every death in this group was in a patient who presented late (after 72 hours) and who, intraoperatively, was found to have gangrenous bowel or faecal peritonitis, emphasising the need for public education on the early signs and symptoms of strangulation, the urgent need to assess appropriately and low threshold for timely operation for strangulation [11,13]. The study has limitations: a single-centre descriptive design makes it difficult to generalise to the wider province and the lack of long term follow-up means that it cannot assess for recurrence or late complications. The evidence in the present study was limited by single centres and by the lack of standardisation of outcome measures, and is therefore insufficient to guide surgical practice in this context.

CONCLUSION

Post-operative adhesions, external hernias and intestinal TB are still the top three causes of intestinal obstruction in adult population who present to this high volume tertiary centre in Peshawar, where the vast majority of cases require surgery. Time to presentation beyond 72 hours is key determinant of morbidity, complications and mortality. To prevent complications and deaths from intestinal obstruction, to strengthen community knowledge about early warning signs and symptoms and to enhance access to elective hernia surgery is crucial, as well as strengthening pathways of pre-operative resuscitation.

CONFLICT OF INTEREST

None.

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