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A Pattern of Intestinal Obstruction Cases – A Tertiary Care Centre Study.

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ABSTRACT

Background: Bowel obstruction is a surgical emergency that causes confusion both in the diagnosis and the management. Decision on whether to operate on the patient or to continue with conservative management as well as the timing of intervention often rests upon the treating surgeon and his competence. **Objectives:** Primary objective of the study was to describe the etiological profile in patients with intestinal obstruction in our institution. Secondary objectives were to study the demographic pattern and the mode of management in these patients. **Material & Methods:** This was a hospital based Cross sectional study conducted at the General Surgery department, Government Medical College Hospital, Trivandrum. The study period was for 18 months, from April 2014 to September 2015. Study subjects included patients admitted in the Surgical wards with intestinal obstruction. Sample size was calculated to be 204 based on reference study. All values are presented as means and percentages. **Results:** Males were found to be affected much more than females. In 70% of patients, small bowel was the bowel predominantly involved. Adhesions were the commonest etiological factor followed by obstructed hernias. Most of the patients underwent operative management. **Conclusions:** Small bowel was the most commonly obstructed part of the bowel while adhesions and hernia form the commonest reasons for intestinal obstruction in our setting. Appendicectomy and laparotomy for perforation peritonitis caused the most postoperative adhesions.

Keywords: Intestinal Obstruction; Intestinal Volvulus; Intussusception

INTRODUCTION

Intestinal obstruction is one of the frequent surgical disorders in general surgical practice and most of the times it is an emergency. Bowel obstruction can be classified in to various types: It can be mechanical (dynamic) or non mechanical (adynamic) according to the mode of obstruction. Impairment to the ab-oral passage of intestinal contents can result from either a mechanical obstruction to the bowel or even failure of normal intestinal motility in the absence of an obstructing lesion. Various mechanical and biochemical changes occur inside the body of a patient with intestinal obstruction. There is fluid accumulation inside the bowel, third space fluid loss and electrolyte abnormalities [Figure 1].

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In spite of tremendous advances in medicine, bowel obstruction still remains a question of good clinical acumen. Bowel obstruction poses great dilemma in both diagnosis and management. Very often, the decision about whether to operate on the patient or to continue with the non-operative management finally rests upon the treating doctor. The surgeon's competence is also tested on deciding on when to go for intervention. The ultimate morbidity and mortality may finally depend on the timely decisions of the treating team.

In most countries, where abdominal operations are common, adhesions and bands form the most common causes for small intestinal obstruction : up to three fourths of all cases. Peritoneal adhesions are common after laparotomy and are exacerbated by intra-abdominal infection, the tissue ischemia associated with wound closure, external beam radiation, and the inevitable presence of foreign material such as sutures. Although small bowel obstruction can occur any time after laparotomy, the risk is found to be greatest in the first few postoperative years. Lower abdominal or pelvic operations have a higher risk for bowel adhesion formation than do upper abdominal procedures.

About one fourth of patients who present with small bowel obstruction have an aetiology other than peritoneal adhesions. Of these, the most common reasons are Crohn's disease, intra-abdominal neoplasms and abdominal wall hernias. Abdominal wall hernias and incisional hernias, as well as

inguinal and femoral hernias, are much more common causes of bowel obstruction than internal or intra-abdominal hernias. Other rare causes for bowel obstruction include intussusception[Figure 2], bands and malrotation. Adhesive bands and external hernias rarely capture the colon. Rarely, the sigmoid colon or transverse colon maybe caught inside an inguinal or umbilical hernia. Carcinoma of the colon is the commonest cause of large bowel obstruction and the lesions are found to arise usually in the sigmoid or rectum. Commonly sigmoid colon and rarely caecum are found to be involved by volvulus also [Figure 3].

From the standpoint of aetiology and management strategies, small bowel obstruction and large bowel obstruction require quite distinctive and separate approaches. It is useful to distinguish if the obstruction is in the small bowel or large bowel when approaching a patient who appears on clinical grounds to have bowel obstruction. The prognosis for non-ischemic cases of small bowel obstruction is good with low mortality rates of 3 to 5%, while prognosis for small bowel obstruction associated with ischemia is fairly high with mortality rates as high as 30%. The purpose of this study is to evaluate the various etiological factors of intestinal obstruction, the various clinical presentations of the disease and the demographic profile of patients admitted with this condition in our tertiary care centre.

Figure 1: Operative photograph of Intestinal obstruction depicting dilated bowel loops

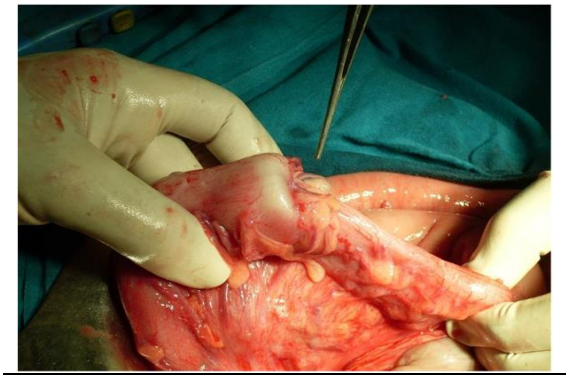

Figure 2: Operative photograph of Intussusception

Figure 3: Operative photograph of Volvulus

MATERIALS AND METHODS

Research design was that of a hospital based Cross sectional study. The study setting was the General Surgery department of Government Medical College hospital, Trivandrum. Study was carried out for a period of 1 and 1/2 years: from April 2014 to September 2015. Study subjects included patients admitted in the General Surgical wards of Government Medical College Trivandrum with intestinal obstruction.

Inclusion criteria: Diagnosed cases of intestinal obstruction (more than 3 air-fluid levels on plain X-ray abdomen), Age more than 12 years.

Exclusion criteria: Adynamic intestinal obstruction cases due to peritonitis or paralytic ileus; previously diagnosed cases of intestinal obstruction.

Primary objective of the study was to analyse the etiological factors in patients with intestinal obstruction admitted in our centre. Secondary objectives were to study the demographic pattern of these patients as well as the mode of intervention in these patients. Random Sampling method was applied. All consecutive patients fulfilling the eligibility criteria and willing to participate in the study were enrolled after getting their consent.

The information given in the reference study[1] was used to calculate the sample size. Formula used for sample size estimation: $n= (Z\alpha)^2pq/d^2$, where n=sample size, $Z\alpha = 1.96$, p = prevalence, q = 100-p, d = 20% of prevalence.

As per the study quoted above, adhesions were the major reason for intestinal obstruction, that is, around 32%. Applying the formula, sample size was estimated to be 204 for our study.

Institutional Review Board and Human Ethics Committee clearance were obtained. Written informed consent was obtained from all the participants before starting the study. Patients admitted with diagnosis of intestinal obstruction were interviewed with the performa and details were collected. Contrast CT and other investigations results were recorded. Intra-operative findings if any were followed up and recorded. Histopathological reports were collected for the operated cases.

Immediately after the admission, resuscitation with intravenous crystalloid fluids, especially ringer lactate and normal saline infusion was instituted till the hydration and urine output become normal. Naso-gastric decompression was carried out and antibiotic prophylaxis started. A close observation of all vital parameters (pulse rate, blood pressure, respiration, urine output, abdominal girth and bowel sounds) was carried out continuously. Blood transfusion was given in required cases. Those patients who showed reduction in abdominal distension and improvement of general condition, especially in individuals with postoperative adhesions were continuing with conservative management. Patients with clear-cut signs and symptoms of acute and progressive bowel obstruction were managed by appropriate surgical procedure after resuscitation.

During the surgery, the findings and procedure adopted were recorded. The patients underwent various operative procedures depending on the intra-operative findings: e.g. release of a bands and adhesions, reduction of intussusceptions, resection and anastomosis for gangrenous bowel etc. Histopathological examination of the specimen of resection/biopsy was done whenever necessary. Throughout the postoperative period, the patients were monitored carefully in the post-operative intensive care units or wards depending on the patients' general condition and toxaemia.

Postoperatively Ryle's tube aspiration, intravenous fluids and antibiotics were continued and tapered or removed on an individual case basis.

Study variables included name, age, gender, history of previous surgeries, intra-operative findings, CECT abdomen findings and histopathological findings. For statistical analysis, 'Epi Info'(CDC) was the software used. Primary outcome of the study was mostly represented using means and percentages. Statistical significance was set at a p value less than 0.05 wherever relevant.

RESULTS

Out of the 204 patients studied in this study, 130 patients (63.72%) were males and 74(36.28%) were females. Small bowel obstruction was seen in 144 patients (70.58%), while large bowel obstruction was seen in 60 patients (29.42%). 65 patients (31.86%) were diagnosed to have post-operative adhesions [Table 1]. 59 patients (28.92%) had obstructed hernia. Malignancy was diagnosed in 33 patients (16.17%). Volvulus was the reason for obstruction in 20 patients (9.88%). Bowel stricture was seen in 5.8%. Other diagnoses caused obstruction in 15 patients (7.37%).

Adhesion was seen in a male to female ratio of 1.95:1 (43 male patients against 22 female patients) [Table 2]. 34 male patients were diagnosed with obstructed hernia against 25 female patients, with a male to female ratio of 1.36. Malignancy was seen in 16 male patients against 17 female patients, with a male to female ratio of 0.94:1. Volvulus was seen in 14 male patients against 6 female patients with a male to female ratio of 2.33:1.

Table 1: Etiological factors in Intestinal obstruction

Diagnosis	Number	Percentage	Cumulative percentage
Postoperative adhesions	65	31.86	31.86
Hernias	59	28.92	60.78
Malignancy	33	16.17	76.95
Volvulus	20	9.8	86.75
Stricture	12	5.88	92.63
Tuberculosis	2	0.98	93.61
Bands	5	2.45	96.06
Faecal impaction	3	1.49	97.55
Others	5	2.45	100
Total	204	100	

Table 2: Etiological factors in Intestinal obstruction with respect to gender

Diagnosis	Males	Females
Adhesions	43	22
Hernia	34	25
Malignancy	16	17
Volvulus	14	6
Stricture	9	3
TB	2	0
Band	5	0
Faecal impaction	2	1
Others	5	0
Total	130	74

Out of the 59 hernia cases, 30(50.85%) were inguinal hernias and all of them were male patients. 14 patients (23.73%) had incisional hernia and all of them were females. Femoral hernia contributed 5 cases (8.48%) of which 4(80%) were female patients and 1(20%) was a male patient. Paraumbilical hernia constituted 6 cases (10.17%). Of the 65 patients with adhesive intestinal obstruction, 18 cases each were old cases of appendicectomie and exploratory laparotomies for perforation peritonitis (27.7% each). Gynaecological interventions and surgeries for malignancies comprised of 9 and 8 cases each (13.8% and 12.3% respectively).

Of the 33 malignancies which caused bowel obstruction, carcinoma sigmoid constituted the majority: 12 cases (36.37%) [Table 3]. Carcinoma rectum was the next with 9 cases (27.27%). Carcinoma colon caused 18.18% of the malignancies which caused bowel obstruction (6 cases). In the study group, operative management was done in 125 patients (61.27%) while 79 patients (38.73%) were conservatively managed. 93% of hernias, 81% of malignancies and 80% of volvulus cases underwent emergency surgeries, while 24% of adhesions were released surgically.

Table 3: Pattern of malignancies in Intestine obstruction

Type of Malignancy	Number	Percentage
Ca sigmoid	12	36.37
Ca rectum	9	27.27
Ca colon	6	18.18
Ca ovary	2	6.06
Ca endometrium	1	3.03
Ca pancreas	1	3.03
Small bowel GIST	1	3.03
Lymphoma	1	3.03
Total	33	100

DISCUSSION

A total of 204 patients were studied and out of this postoperative adhesions contributed to 31.86% of the cases with intestinal obstruction. Obstructed hernias formed the next important reason, contributing to 28.92% of causes. Malignancy was the third reason for intestinal obstruction with 16.17% of total number of cases. All these combined contributed to 76.95% of the causes. A study conducted by Souvik Adhikari et al in eastern India showed that hernias were the most common cause of intestinal obstruction.[2] Our study results are comparable with other study groups like Thampi et al[3] and Playforth et al.[4] According to a study by McEntee et al, adhesions formed the most important cause of intestinal obstruction in western population.[1] According to two studies by Miller et al and Foster et al, hernia caused less than 10% to intestinal obstruction.[5,6] But statistics in this part shows that hernia contributed approximately 29% of cases to intestinal obstruction. As per majority of the available studies, adhesions, incarcerated hernias, and large bowel cancers constitute the most frequent causes for bowel obstruction. [7-9]

Of the 204 cases studied, small bowel obstruction was seen in 144 patients (70.58%) and large bowel was seen in 60 cases only(29.42%). It is estimated that 80-90% of bowel obstruction happens in small bowel and 10-20% in large bowel.[10] The statistics in this study almost compares with that of the international studies due to the fact that adhesions contributed to majority of the cases.

130 patients (63.72%) in the study group were male and 74(36.28%) were female. Adhesion was seen in a male to female ratio of 1.95:1(43 male patients against 22 female patients). Appendicectomy and exploratory laparotomy for perforation peritonitis contributed to 56% of total cases of post-operative adhesions. Obstructed hernia also showed a clear male preponderance due to the fact that 51% of total number of obstructed hernia was obstructed inguinal hernia. Since inguinal hernia is mostly seen among male patients, obstructed inguinal hernia is seen more among them.[11] Malignancy showed no sex predilection as colon cancer is seen more among females and rectal cancer is more among males.[12] Since these two contributed to the majority of cancers causing obstruction, the combined numbers showed no sex predilection.

Of the 59 obstructed hernia cases, 50.85% cases were contributed by inguinal hernia. This statistics is significant in the setting that majority of hernia cases are inguinal in nature.[12] All the 30 obstructed inguinal hernia occurred in male patients due to the fact that inguinal hernia occurs mostly among males. 14 patients (23.73%) had incisional hernia and all of them were females. 12 out of the 14 cases(85.1%) had gynaecological interventions earlier. Of the 5 obstructed femoral hernias, 4 occurred in female and in male, showing the fact that femoral hernia is mostly seen among female gender[13]. Abdominal hernias are found to account for around 8%-25% of all cases of intestinal obstruction,[14,15] while in a few series they represent the most common cause of intestinal obstruction.[[16,17] Moreover, they still remain the most common cause for bowel strangulation and ischaemia.[18]

Of the 33 malignancies causing intestinal obstruction, carcinoma sigmoid colon constituted 36.37% of cases followed by carcinoma rectum (27.27%). If the level of growth is more proximal, intestinal obstruction wouldn't manifest as the faecal matter is more liquid in consistency. So it is logical that distal colonic malignancies would present as obstruction earlier than proximal lesions. Appendicectomie and exploratory laparotomies constituted 27.7% each for adhesive intestinal obstruction. Since appendicectomy is one of the most commonly performed surgeries, obstruction related to post operative adhesions after appendicectomy may be more common. Appendectomies, gynaecological operations, cholecystectomie, and large bowel cancer resections are supposed to be the commonest surgeries leading to adhesions.[19,20] Operative management was done in 125 patients (61.27%) while 79 patients (38.73%) were conservatively managed. 93% of hernias, 81% of malignancies and 80% of volvulus cases underwent emergency surgeries, while 24% of adhesions were released surgically.

The limitations of our study included the fact that the study was carried out in a tertiary care centre, so it reflected a population in whom the treatment could not be done in a primary or secondary healthcare facility. Hence it cannot be taken as representative enough of the entire community. Also, being a tertiary level teaching institution, our management is slightly biased towards operative intervention than conservative approach.

CONCLUSION

As a summary, majority of the intestinal obstruction in our scenario are caused by postoperative adhesions, followed by obstructed hernias and bowel malignancies. So better operative care and

techniques need to be employed in primary laparotomy so as to reduce the chances for development of post-operative adhesion. Inguinal hernia constituted majority of obstructed hernia followed by incisional hernia. Hence patients need to be educated about the complications of hernia and thus advised to get surgical opinion at early stages itself. Also important is to assess in detail those patients presenting with significant bowel symptoms and to evaluate them for malignancy. Diagnosis of bowel malignancies at early stage itself can reduce the complications and ensure a better prognosis.

To conclude, acute intestinal obstruction remains an important surgical emergency in the surgical field, with significant morbidity as well as mortality. Great caution should be taken for the treatment of patients with acute mechanical bowel obstruction since the incidence of bowel ischemia, necrosis, and perforation is significantly high. Clinical as well as radiological findings put together can diagnose intestinal obstruction adequately. Though a major proportion of these patients can be managed non-operatively, substantial portions do require immediate operative intervention. Success in the management of acute intestinal obstruction depends largely upon prompt diagnosis, adequate resuscitation and skillful management.

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