International Surgery Journal
Chitumalla PK et al. Int Surg J. 2017 Feb;4(2):485-490
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20164846

Original Research Article

Clinical study of bowel obstruction in relation to etiological factors

Pradeep Kumar Chitumalla*, Naresh Kumar Vemulapally, Surya Narayana Reddy

Department of General Surgery, Chalmeda Ananda Rao of Institute of Medical Sciences, Karimnagar, Hyderabad, Telangana, India

Received: 28 November 2016
Accepted: 26 Decmeber 2016

***Correspondence:**
Dr. Pradeep Kumar Chitumalla,
E-mail: vanisu1990@gmail.com

ABSTRACT

Background: Acute intestinal obstruction is one of common abdominal emergency and is associated with significant morbidity and mortality, especially if it progresses to bowel ischemia. The aims of this study was to analyse various modes of presentation of acute intestinal obstruction in both children and adult age group, etiopathogenesis, various therapeutic modalities of treatment and to accomplish operative management and anticipate the post operative complications.
Methods: 50 consecutive patients of all age groups presenting with acute intestinal obstruction were admitted were taken randomly and managed between October 2013 to September 2015.Out of these 50 cases, 36 were male, 14 were female, patients with subacute intestinal obstruction and patients with paralytic ileus were excluded in this study. Plain X-ray erect abdomen was done in all cases. Ultrasonography was done only in those patients whose X-ray finding was inconclusive. CT as a modality also included for work up.
Results: Mean age distribution was 35.4years and the standard deviation measured 24.57. Incidence in male (36) was more as compared to female population (14). Pain abdomen was found in 45(90%) patients, vomiting in 35(70%) patients, distension abdomen in 34 (68%) patients and constipation in 30 (60%) patients were noted as many patients had coincidence of symptoms. Commonest cause of acute intestinal obstruction noted was postoperative adhesions.
Conclusions: Postoperative adhesions were the commonest cause of obstruction. Earlier the presentation, the better the outcome was found.

Keywords: Intestinal obstruction, Intussusception, Resection and anastomosis

INTRODUCTION

Acute intestinal obstruction is one of the commonest surgical emergencies in all age groups. Mode of presentation varies with underlying etiology, variability in etiology. In earlier part of century mortality and morbidity was very high. Now with better understanding of pathophysiology, improvement in radiological techniques of diagnosis and high degree of refinement in correction of fluid and electrolyte imbalance, introduction of antibiotics to effective bacteriological control, introduction of techniques in gastrointestinal decompression, new surgical principles, as in large bowel obstruction introduction of on table lavage and resection and primary anastomosis has replaced staged procedures and number of days in hospital stay. With all the advanced technical investigations, we can predict the obstruction is involving the small bowel or large bowel. Improvement in field of anesthesia has all contributed to lowering the morbidity and mortality.

The dictum of never let the sun set or rise in small bowel obstruction has made early surgical intervention for intestinal obstruction.[1] As etiological factors varies, clinical features varies and site of obstruction varies, So

all these factors are making a difference in outcome of any operative procedure in relation to morbidity and mortality. Success in treatment of patient with acute intestinal obstruction depends largely upon early diagnosis, skillful management and appreciation of importance of treating the pathological effects of obstruction just as much as the cause itself. The aim of this study was to analyze the different modes of presentations of acute intestinal obstruction in children and adults.

METHODS

A total number of 50 cases of acute intestinal obstruction have been studied from October 2013 to September 2015. Study was done in selected patients with all age group who attended to OPD and emergency department at Chalmeda Ananda Rao Institute of Medical Sciences, A clinical study of acute intestinal obstruction were selected in routine practice every surgeon has to come across this surgical emergency and treatment would largely depend on early diagnosis and skillful management.

With history and clinical picture suggestive of acute intestinal obstruction, also the patients who had hernia with recent onset of irreducibility, pain, vomiting and constipation were included in the study.

Subacute intestinal obstruction and paralytic iles were excluded from the study.

All patients with provisional diagnosis of acute intestinal obstruction were assessed clinically in detail as proforma after admission. Patients with history of subacute intestinal obstruction were excluded from this study. On admission a relevant pathological and biochemical investigations were carried out in all cases. Plain X-ray erect abdomen was carried out all patients. Ultrasonography of abdomen and CECT abdomen was done in some cases whose diagnosis by X-ray was inconclusive. Serum electrolytes were carried out in all cases.

All patients were subjected to surgery as all cases were of acute presentation. Prior to surgery stabilization of patients with shock, correction of electrolyte imbalance and nasogastric decompression was done. Appropriate surgical procedure was carried out. Postoperative follow up period ranged between 2-6 months from time of discharge, some patients were not regular in their follow up visits. The results were tabulated according to age, sex, symptoms, signs, probable causative factors, operative findings, operative procedure adopted and post-operative complications.

RESULTS

A clinical study of 50 cases of acute intestinal obstruction was studied during period of 2 years .

Table 1: Demographic distribution.

Age (in years)	Total cases	Percentage
0-10	3	6
10-20	4	8
21-30	7	14
31-40	14	28
41-50	9	18
51-60	3	6
61-70	4	8
71-80	4	8
81-90	2	4

The study was done in all age groups ranging from newborn to 85yrs with a mean age of 35 years

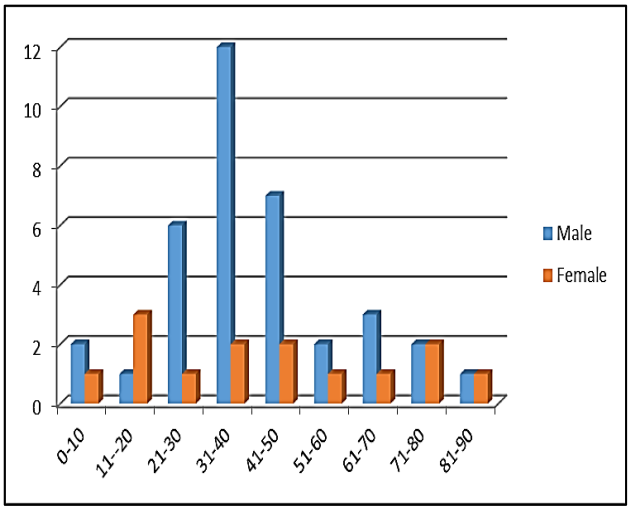

Figure 1: Incidence of gender in study.

The occurrence of acute intestinal obstruction was common in male (72%) with comparison to female (28%). There were 36 male & 14 female with male to female ratio 2.6:1.

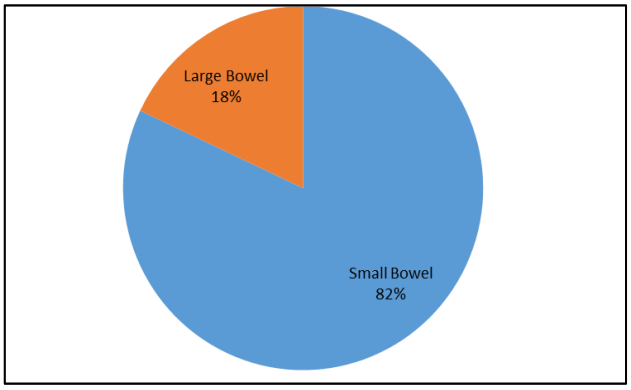

Figure 2: Levels of obstruction.

There were more of small bowel obstruction (41) when compared to large bowel obstruction.

- High small bowel obstruction: 10 cases
- Low small bowel obstruction: 31 cases
- Large bowel obstruction: 09 cases

Table 2: Analysis of symptoms and signs.

Symptoms and signs	No. of cases	Percentage
Pain abdomen	45	90
Vomiting	35	70
Tenderness	50	100
Abdominal distention	34	68
Constipation	30	60
Increased bowel sounds	25	50
Absent bowel sounds	10	20
Decreased bowel sounds	15	30
Groin swelling	9	18
VP	8	16
Guarding + Rigidity	11	22
Palpable mass	-	-
Significant PR findings	1	2

Tenderness of abdomen (100%) is most common sign found in study

Table 3: Etiologies in obstruction.

Etiology of acute intestinal obstruction.		
Adhesions	13	26
Obstructed hernias	9	18
Small bowel volvulus	7	14
Bands	6	12
TB stricture	2	4
Meckel's diverticulum	1	2
Intussusception	2	4
Meconium ileus	1	2
Etiology of large bowel obstruction		
Neoplasms	4	8
Volvulus	3	6
Intussusception	2	4
Causes of strangulation		
Hernias	4	8
Volvulus	8	16
Adhesions	2	4
Others	3	6

Plain X-ray erect abdomen was done in all 50 cases.

For higher accuracy and better diagnosis, Ultrasonography abdomen and CECT abdomen were done in inconclusive cases. The incidence of strangulation was seen in up to 36% patients (18).

Small bowel obstruction

Resection and anastomosis (12 cases) and adhesiolysis (11) were carried out commonly followed by band release and hernia repair (5 cases each),. Meckel's diverticulectomy was done in one case and resection and stoma in one case of meconium ileus.

Large bowel obstruction

Colostomy was done in 3 cases, resection and anastomosis in 4 cases and intussusception milking in one case. Derotation and sigmoidopexy done in 2 cases.

Table 4: Management of cases in study.

Small bowel obstruction management	Cases	Percentage
Adhesiolysis	11	22
Resection and anastomosis	12	24
Band release	05	10
Milking	02	4
Hernia repair	05	10
Resection and hernia repair	04	8
Meckel's diverticulectomy	01	2
Meconium ileus (resection and stoma)	01	2
Large bowel obstruction management		
Resection and anastomosis	04	8
Colostomy	03	6
Derotation and sigmoidopexy	02	4

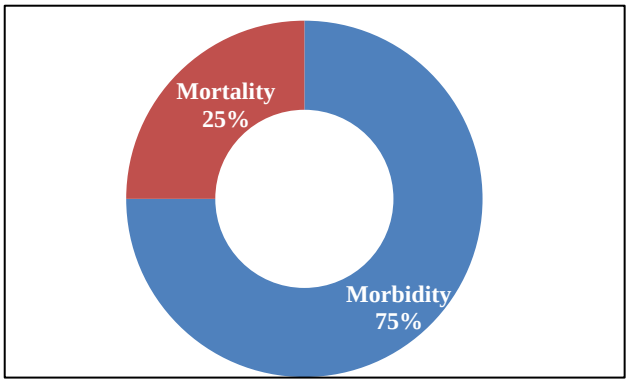

Figure-3: Complications observed in this study

Causes of mortality

- Septicemia: 3
- Respiratory infection (Pneumonia): 2

Presence of strangulation and comorbid conditions added mortality.

DISCUSSION

Intestinal obstruction is one of the commonly encountered clinical entities. There is probably not a day that goes by, in which a clinical surgeon does not at least once, come across the possible diagnosis of intestinal obstruction. The mortality has reduced significantly by instituting the treatment at the earliest period. 1-4% of

mortality in emergency surgeries is contributed by acute intestinal obstruction. In the present series small bowel obstruction contributed to 82% and large bowel obstruction 18%. This is comparable with reports of Michel and Becker where small bowel obstruction constituted to 80% and large bowel obstruction constituted 20%.[2,3]

Age incidence

The acute intestinal obstruction occurs in all age groups. The age distribution in our series ranges from newborn to 85 years with mean age of 35.4years. Maximum incidence was seen between age group of 31 to 40 years (28%). Earlier studies conducted by Gill et al has reported 19.04% of cases in age group of 0-10 years.[4] In another study by Budharaja5 reported 13% of cases of acute intestinal obstruction below 12 year age. Fuzan6 reported mean age of 56 years.

Sex incidence

In our study the incidence of intestinal obstruction in males was 36 (72%) and that of females was 14 (28%). Male to female ratio is 2.6:1.0 (3:1). The male preponderance is consistent with series reported from other part of world. Fuzan et al and Lee et al reported 2:1 male to female ratio. Budharaj5 reported in his study a ratio of 4:1 between male and female.[6,7]

Etiology

A total of 26% of cases attributed to adhesions. Among adhesions 24% of the intestinal obstruction was due to postoperative adhesions and remaining 2% was found to be non-specific. Majority of incidence was found within 1 year of surgery. Duron JJ, et al found that adhesions contributed for intestinal obstruction upto 25.5%.[8] Ti et al reported that postoperative adhesions and bands contributed upto 23.8% as cause of intestinal obstruction in 62 cases with only postoperative adhesions in 52 patients (19.2%).[9] Fuzan et al study in 582 patients found that, in 246 (42.2%) patients the cause for intestinal obstruction was adhesions due to previous operations.[6]

A total number of 9 (18%) cases of intestinal obstruction are related to hernia in this study of 50 cases. Out of these 9, 4 (44%) cases are strangulated hernia. All 9 cases of hernia are in male patients. All 4 of the strangulated hernia patients underwent resection and anastomosis. In other five cases only hernia repair was done. All cases were of inguinal hernia.

In the series of Sarr MG shows hernia related strangulation was present in 42% patients. Ramachandran reported 38.6% of overall incidence of strangulated small bowel obstruction with 21.4% of obstructed hernia in adults.[4,10]

Budhraja et al studies revealed the etiology for acute intestinal obstruction secondary to obstructed hernia (small bowel and large bowel) accounted for 33%. In his study, the incidence of gangrene was up to 22%.[5]

Volvulus constituted for about 20% in our studies that is 10 cases. Out of these 10 cases, 7 were small bowel volvulus and 3 cases were of sigmoid volvulus. A study conducted by Sankaran11 reported 24 cases of volvulus in South India among which sigmoid volvulus predominated forming 50% of cases. Budharaja series revealed that 18.2% of intestinal obstruction was due to volvulus and in that 11.9% was due to small bowel volvulus and 6.19% due to large bowel volvulus.[5] Peter et al study showed that 26% of small bowel obstruction was due to volvulus.[12] Gangrene of sigmoid volvulus was found in 33% of cases in present series but in studies by Sarkar et al revealed 31% of gangrene.[13] Roggo et al series reported that the twisted segment was found to be gangrenous in 46% of patients.[14] They also proposed in their study that small bowel volvulus accounts for 3.5% - 6.2% of all cases of small bowel obstruction and 5% - 22.7% of all intestinal obstructions.

Ramachandran et al in his study quotes that volvlus is the second commonest cause of small bowel obstruction which accounted for nearly 24%.[10] Gill reported that incidence of volvulus was 25% (36 cases), out of these small bowel volvulus accounted for 23 patients and large bowel volvulus for 13 patients.[4] In our study intestinal obstruction due to bands accounted for 12%. A study series by Gill et al 4 of 147 cases showed that 6.8% of small intestinal obstruction is due to bands.

In the present study acute intestinal obstruction related to malignancy constituted for 8% (4 cases). 3 of the 4 are due to stricturous growth in left colon (one in sigmoid and two in descending colon) and one from right colonic growth. Ti noted that carcinoma of descending colon and rectum constituted 37.2%.[15] Ascending colon and caceum constituted 9.8%. Thompson in his series recorded the incidence of obstructing carcinoma of right colon equals 26% and left colon 69%.[16] Ramachandran found in his study that sigmoid colon cancer accounted for 6.6% of intestinal obstruction in large bowel, which is nearer to our study.[10] Fuzan revealed the cause of malignant large bowel obstruction of which ascending colon constituted 3.38% and sigmoid colon constituted up to 27%.[5]

In our study sigmoid colon cancer, descending and ascending colon accounted 33.3% each. Tzu-chi series managed a total number of 214 cases, out of which causes of colonic obstruction found was 71 (34.8%) in right colon, 127 in left colon of which sigmoid colon obstruction was found in 54 (42.5%) patients.[17]

In our study of 50 cases of acute intestinal obstruction 4 cases were of intussusception (8%), out of these 4 cases, 2 were causing small bowel obstruction and 2 large bowel obstruction. Ti revealed his study of 261 patients

the incidence of intussusception accounted for 6.3% (17 cases) of intestinal obstruction. Another series by Kuruvilla intussusception accounted for 6.3% of the cases of total intestinal obstruction.[15,18]

The present study accounted for 4% (2 cases) of tubercular stricture as a cause for intestinal obstruction. Budharaja in review of 242 cases reported that intestinal tuberculosis giving rise to acute intestinal obstruction was seen only in 2.1% of cases.[5] The study series of Sircar reported to have 5% of cases of abdominal tuberculosis present with acute intestinal obstruction.[19] Kappor et al in series managed 109 cases of abdominal tuberculosis out of which 09 (8.2%) cases were purely had acute intestinal obstruction.[20]

Our study concluded with the incidence of Meckel's diverticulum constituting for 2% (1case) of acute intestinal obstruction. Budharaja reported to have incidence of 1.23% of Meckle's diverticulum causing intestinal obstruction.[5] Ramachandran in series stated about 4.2% of acute intestinal obstruction was due to Meckel's diverticulum. The incidence of meconium ileus is 1 in 2000 live births. In our study it was only one case that caused intestinal obstruction.[10]

Clinical features

Maximum presenting symptoms in this study was Pain abdomen 90% (45 cases), vomiting 70% (35 cases), distention abdomen 68% (34 cases) and constipation 60% (30 cases) Asbun in their retrospective analysis of 105 cases of small bowel obstruction found that incidence of pain abdomen 82%, vomiting 88%, were commoner than constipation (28%) and distention of abdomen (56%).[21]

Budharaja in his study reported that, symptoms of in order of frequency were pain abdomen 95%, distention of abdomen 82%, vomiting 75%, absolute constipation 50% constituting acute intestinal obstruction. Al Salamah SM, Fahim F et al in his study reported that, symptoms of in order of frequency were pain abdomen 90%, distention of abdomen 80%, vomiting 72%, absolute constipation 45% constituting acute intestinal obstruction.[5,22]

Constipation and distention are predominant symptoms in large bowel obstruction when compared to small bowel obstruction where pain abdomen and vomiting were more common. All cases were operated in this study. Adhesiolysis done in 11 cases, resection and anastomosis was done in 16 cases.

CONCLUSION

The occurrence of acute intestinal obstruction is more in small bowel. All age groups from newborn to elderly were involved. The incidence of intestinal obstruction is more common in males compared to females. Mode of presentation also differs in different levels of intestinal obstruction. Adhesions accounted for majority of small bowel obstruction (26%). Plain X-ray erect abdomen is the single important diagnostic tool for diagnosing intestinal obstruction and its level of obstruction. The distal the obstruction the greater the accuracy found. Early recognition and timely intervention is important to prevent the bowel going for gangrenous changes.

Inspite of all investigations and technical advances Abdomen is still as a magic box, surprises and eventually any surgeon should be well prepared to take on table proper decision for the found pathology. Morbidity was due to anastomotic leak, would infection, chest infection and wound dehiscence. Prognosis was poor in elderly patients and newborns, in patients with comorbid conditions, presence of strangulated bowel that required resection and anastomsis and those whose presentation to hospital was late.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Winslet MC. Intestinal obstruction. In: Russel RCG, Williams NS, Bullstrode CJK, editors. Bailey & Loves Short practice of Surgery 23rd edition. Edward Arnold ltd NY. 2000;1058:75.
2. Michel ML, Knapp L, Davidson A. Acute intestinal obstruction; comparative studies of small intestinal and colic obstruction. Surg. 1950;28:90-110.
3. Becker WF. Acute obstruction of colon - an analysis of 205 cases. Surg Gynaec Obsetet. 1953;96:677-82.
4. Gill SS, Eggleston FC. Acute intestinal obstruction. Arch Surg. 1965;91:389-92.
5. Budharaja SN, Govindarajalu S, Perianayagum WJ. Acute intestinal obstruction in Pondicherry. IJS. 1976;111-7.
6. Fuzan M, Kaymake E, Harmancioglu O, Astarcioglu K. Principal causes of mechanical bowel obstruction in surgically treated adults in Western Turkey. BJS. 1991;78:202-03.
7. Lee SH, Ong ETL. Changing pattern of intestinal obstruction in Malayasia - a review of 100 consecutive cases. BJS. 1991;78:181-2.
8. Duron JJ, Silva NJ, Montcel ST, Berger A, Muscari F, Hennet H, et al. Adhesive postoperative small bowel obstruction: incidence and risk factors of recurrence after surgical treatment: a multicenter prospective study. Ann Surg. 2006;244(5):750-7.
9. Ti TK, Young NK. The pattern of intestinal obstruction in Malaysia. BJS. 1976;63:963-5.
10. Ramachandran CS. Acute intestinal obstruction: 15 years' experience. IJS. 1982;672-679.
11. Sankaran V. Volvulus in Sounth India. IJS. 1962: Indian J Surg. 1962;24:784-90.
12. Mucha P, Small intestinal obstruction. Surg North Am. 1987;67(3):597-618.

13. Sarkar PK, Sarkar V. Primary resection and anastomosis associated with maximal rectal stretching (MRS) for treatment of acute sigmoid volvulus. IJS. 2000;62(2):122-4.
14. Roggo A, Ottinger LW. Acute small bowel vovulus in adults. Ann Surg. 1992;2:135-41.
15. Ti TK, Young NK. The pattern of intestinal Obstruction in Malaysia. BJS. 1976;63:963-5.
16. Thompson RW, James BD, Mark MD. Obstructing adenocarcinoma of right side of the colon. Arch Surg. 1968;96:100-3.
17. Hsu TC. Comparison of one stage resection and anastomosis of acute complete obstruction of left and right colon. AJS. 2005;189:384-7.
18. Kuruvilla MJ, Challeni CR, Rajagopal AK, Rakas JS. Major causes of intestinal obstruction in Libya. BJS. 1987;74:314-5.
19. Sircar S, Taneja VA, Kanasara U. Clinical presentation of abdominal tuberculosis - A prospective study. IMA. 1996;94(9):342-4.
20. Kappor VK, Gupta S, Sikora SS. Acute tubercular abdomen. IJS. 1991;53:71.
21. Asbun HJ, Perpinello C, Halasz NA. Small bowel Obstruction and its management. Int Surg. 1989;74:2-27.
22. Salamah SM, Fahim F, Hameed AM, Abdulkarim AA, Mogbal ES, Shaer A. How predictive are the signs and symptoms of small bowel obstruction. Oman Med J. 2012;27(4):281-4.

Cite this article as: Chitumalla PK, Vemulapally NK, Reddy SN. Clinical study of bowel obstruction in relation to etiological factors. Int Surg J 2017;4:485-90.