

A 10 Years Retrospective Observational Clinical Study of Intestinal Obstruction in Adults

Aftabuddin Ahmed¹, Rahul Jain², Arpit Bandi³

¹Fellow, Minimal Invasive and Bariatric Surgery, MAX Hospital, Chennai, Tamil Nadu, India, ²Senior Resident, Maharishi Valmiki Hospital, New Delhi, India, ³Senior Resident, Gujarat Cancer Research Institute, Ahmedabad, Gujarat, India

Abstract

Introduction: Obstruction to the bowel is a commonly encountered problem in gastrointestinal surgery all over the world. It is a symptom complex of a disease with diverse etiologies of wide geographical variations worldwide. The resultant pattern of intestinal obstruction is dependent on several factors including environmental, cultural, dietary, demographic factors, variations in socio-economic level, as well as individuals anatomic differences. Knowledge of the local disease patterns and outcomes may raise the index of suspicion, and reduce delays in diagnosis, referral, and/or operative intervention.

Materials and Methods: This is retrospective observational study conducted at St Stephen's Hospital, Delhi, drawing on medical records dated from January 1, 2006, to December 31, 2015. All patients, irrespective of religion, race, gender, ethnicity, location, and ≥ 18 years of age were included in the study.

Results: Most common presentation was as colicky abdominal pain (97.40%) while 2nd most presenting symptom was abdominal distention (20.45%). Maximum number of patients presented within the 1st week of onset of symptoms. The most common finding was abdominal tenderness (78.84%) and abdominal distention (61.11%), followed by guarding (13.83%). Adhesive intestinal obstruction was found to be the most common cause with 273 (32.27%), followed by indeterminate 224 (26.48%) and abdominal tuberculosis 144 (17.02%) of the cases. Tuberculosis is found in a younger population with a mean age of 33.23 years. Malignancy, ileus and adhesions are seen in the sixth decade mainly.

Conclusion: Detailed history and clinical examination are important tools for management of intestinal obstruction. X-ray abdomen erect plays a significant role in establishing the diagnosis while contrast computed tomography helps in knowing the cause and site of obstruction. Conservative management should be the initial approach failure of which may require surgery. Type of surgery should be decided on basis of age, hemodynamic status, and intraoperative findings.

Key words: Bowel, Intestine, Obstruction

INTRODUCTION

Intestinal obstruction occurs due to the failure of propagation of intestinal contents, and may be due to a mechanical or functional pathology.^[1,2] Mechanical intestinal obstruction is one of the leading causes of surgical admissions in most emergency departments

worldwide^[3] and can be classified largely as dynamic (mechanical) or adynamic (functional) obstruction.^[4,5]

The objective of this work is to know the prevalence and distribution of different causes of intestinal obstruction in different age and gender group have a better understanding of the presentation of intestinal obstruction and recommend line of management options based on the study outcome.

MATERIALS AND METHODS

Study Design and Period

Single hospital-based retrospective observational study design was conducted at St Stephen's Hospital, Delhi, drawing on medical records dated from January 1, 2006

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Month of Submission : 06-2021
Month of Peer Review : 07-2021
Month of Acceptance : 07-2021
Month of Publishing : 08-2021

Corresponding Author: Dr. Rahul Jain, 86, Ramchandra Nagar Extension, Aerodrome Road, Indore, Madhya Pradesh, India.

to December 31, 2015. Data collection period was from November 2014 to June 2016.

Inclusion Criteria

All cases recorded as having IO during the period of study, 18 years of age and above.

Exclusion Criteria

The following criteria were excluded from the study:

- Patients below 18 years of age
- Patients admitted for a different medical ailment, where IO was an incidental finding but not worked up further.

Data Processing, Analysis, Interpretation and Presentation

SPSS version 20.0 software is used for statistical analysis. Chi-square test and ANOVA were used to ascertain relationships between variables. $P < 0.05$ is considered statistically significant.

RESULTS

- A total of 846 people were included in this study
- Overall, 779 people were discharged after treatment, 50 people left against medical advice, 14 people were Discharged on Request, and 3 were referred to some other hospital.

Age Distribution

- The age range was from 18 years to 95 years with a mean of 45.01 years and a standard deviation of ± 18.54 . Most of the patients were between 20 and 30 years with an even distribution from 30 to 70 years.

Gender Distribution

- In the current study, there were 464 (54.85%) of male patients and 382 (45.15%) of female patients
- Male to female ratio is 1.2: 1.

Presenting Symptoms

- The frequencies of the chief complaints and the common presenting symptoms are represented in the table. Colicky abdominal pain, vomiting, constipation, and obstipation are the most frequent
- None of the symptoms were found in isolation. They co-existed together.

Duration of Symptoms

- Maximum number of patients presented within the 1st week of onset of symptoms
- 418 (49.41%) patients actually presented within the 1st 3 days
- Only 40 (4.73%) patients presented after 2 weeks
- The mean duration before presentation is 3.74 with a Standard deviation of ± 5.26 .

Presenting Physical Signs

- The frequency of physical signs was as shown in the table below
- The most common finding was abdominal tenderness (78.84%) and abdominal distension (61.11%), followed by guarding (13.83%).

Bowel Sounds

- Exaggerated bowel sound and lower abdomen succussion splash was seen in the majority
- Lower abdomen succussion splash was not seen in isolation. It co-existed with either of the other three.

Causes of Obstruction

- The various causes of intestinal obstruction as found in the study are listed below.
- Adhesive intestinal obstruction (AIO) was found to be the most common cause with 273 (32.27%), followed by indeterminate 224 (26.48%) and abdominal tuberculosis (AT) 144 (17.02%) of the cases.
- The P value is significant in males with ileus, band adhesions, and obstructed hernias.
- It is also significant for males, where the cause was indeterminate.

Cause with Age Distribution

- Tuberculosis is found in a younger population with a mean age of 33.23 years
- Malignancy, ileus, and adhesions are seen in the sixth decade mainly.

Types of Intestinal Obstruction

- Mechanical obstruction accounted for the majority of the cases 603 (71.28%)
- Ileus accounted for only 19 (2.25%) patients.

Distribution of Stricture as a Cause

- Strictures accounted for 10.19%, that is, 83 patients. Among whom, 38 (45.79%) patients had tuberculosis (biopsy proven)
- Small bowel had 83.13% of the cases, which is statistically very significant. Ileum having the maximum incidence of 56 (67.47%) of all the strictures.

Previous Surgeries as a Cause of AIO

- Exploratory laparotomy done for any reason is the leading cause of adhesions.
- Gynecological surgeries accounted for 8.39% of the causes of adhesion.

Management

- A total of 602 (71.16%) of the patients were treated conservatively, while the rest 244 (28.84%) of the patients required surgical treatment.

Operative Management Type

- Out of the 244 (28.84%) patients who were taken up for operative treatment, 104 (12.29%) patients had bowel resection and anastomosis and/or stricturoplasty, and 23 (2.72%) had bowel exteriorized, while in the majority, 112 (13.24%) patients did not require bowel opening.
- While few people with small perforation, required primary closure.

Duration of Hospital Stay

- Most of the patients, 497 (58.75%) were discharged from the hospital within the 1st week
- Another 261 (39.85%) patient were discharged within 2 weeks of admission
- Whereas 50 (4.49%) patients required a prolong hospital stay more than 3 weeks.

Complications

- Overall complication was seen in 60 (7.10%) patients
- Only complications that occurred during the hospital stay was noted. Delayed, or long-term complications after the discharge were not followed
- Surgical site infection (SSI) was present in 1.77% of the cases [Charts 1-3 and Tables 1-10].

DISCUSSION

In this study, 464 (54.85%) cases were male while 382 (45.15%) were female giving a male female ratio of 1.2:1 which showed a slight male preponderance. The previous studies done also showed a male predominance rates of 60–77%.^[6-8]

The age range of this study was from 18 years to 95 years with a mean of 45.01 years and a SD of ±18.54. Relevant studies also reported a mean ages between 32 and 45 years.^[9-11] The 45.01 years mean age in this study, though at variance with 25 and 63.8 years reported by Drożdż and Budzyński and Markogiannakis *et al.*, respectively, but is very similar to 43.08 years reported by Arshad *et al.*, 41.27 years by Souvik *et al.* and 45 years by Lawal *et al.* shows the variability in the age distribution of bowel obstructions depending on the underlying cause.^[12-14]

The pattern of intestinal obstruction at STH was in contrast to that of earlier reports in the western advanced countries reported by McAdam and Garrido.^[15] where strangulated hernias were found to be the commonest cause in developing countries. The main cause of intestinal obstruction at STH is due to adhesions 273 (32.27%) patients, mainly associated with the previous laparotomies and AT 144 (17.02%) patients. While a huge number of patients 224 (26.48%) remained as indeterminate.

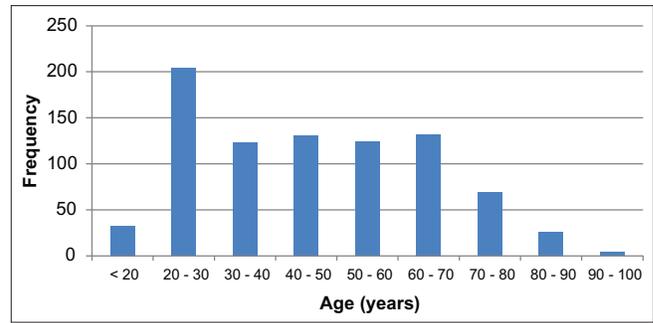


Chart 1: Age distribution of the study population

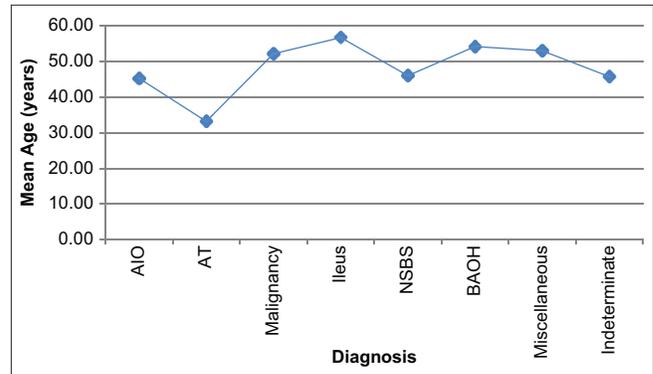


Chart 2: Causes of intestinal obstruction with mean age distribution

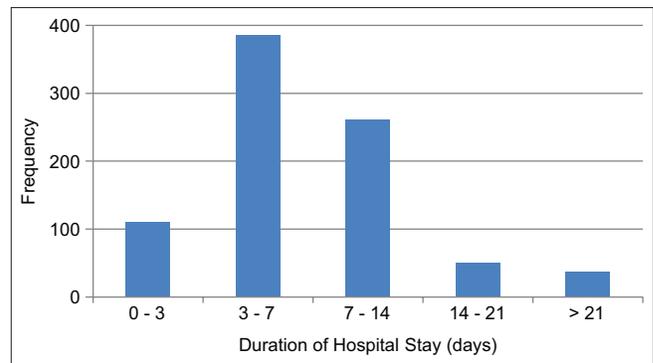


Chart 3: Distribution of the duration of hospital stay

An article released in the June edition, 2016 of BMJ shows a study done in Ethiopia, by Seresa *et al.*, shows most small bowel obstruction was found to be secondary to intussusceptions (in 30.9% of the cases) or volvulus (in 30.3% of the cases). Large bowel obstruction was mainly caused by sigmoid volvulus (69.0%) and colonic tumor (5.3%). The main intra-operative finding was intussusceptions, which accounted for 21% followed by adhesion and bands in 18.4%.^[16] Another study published in 2014 by Ojo *et al.*, showed That adhesions accounted for more than half of mechanical intestinal obstruction 51.6% followed by appendectomy 32.1%, pelvic and gynecological surgeries 28.6%, typhoid perforation 12.5%, laparotomy for abdominal trauma 4.5%, perforated

Table 1: Frequency of symptoms

Symptoms	n	%
Colicky abdominal pain	824	97.40
Abdominal distension	173	20.45
Vomiting	694	82.03
Obstipation	427	50.47
Constipation	435	51.42
Loose stool	48	5.67
Anorexia	66	7.80
Weight loss	40	4.73

Table 2: Duration of symptoms

Duration of symptoms (days)	n	%
0–3	418	49.41
3–7	318	37.59
7–14	64	7.57
14–21	28	3.31
>21	12	1.42
Total	840	99

Table 3: Frequency of presenting signs

Presenting signs	n	%
Tachycardia	85	10.05
Dehydration	28	3.31
Fever	90	10.64
Pallor	81	9.57
Distension	517	61.11
Visible peristalsis	22	2.60
Tenderness	667	78.84
Rebound tenderness	27	3.19
Guarding	117	13.83

Table 4: Causes of intestinal obstruction with gender wise distribution

Gender→	Male		Female		P-value	Total patients	
	n	%	n	%		n	%
AIO	129	47.25	144	52.75	0.100	273	32.27
AT	78	54.17	66	45.83	0.079	144	17.02
Malignancy	20	47.62	22	52.38	0.331	42	4.96
Ileus	13	68.42	6	31.58	0.012	19	2.25
Non-specific bowel stricture (NSBS)	23	52.27	21	47.73	0.335	44	5.20
Band adhesions and Obstructed hernias (BAOH)	33	60.00	22	40.00	0.018	55	6.50
Miscellaneous	28	62.22	17	37.78	0.010	45	5.32
Indeterminate	140	62.50	84	37.50	<0.001	224	26.48

AIO: Adhesive Intestinal Obstruction, AT: Abdominal tuberculosis

peptic ulcer 2.7%, hepatobiliary surgery 1.8%, multiple procedures 14.3%, and unspecified 3.6%.^[17] The present study showed that exploratory laparotomy done for any reason accounted for 16.08%, followed by gynecological

Table 5: Types of intestinal obstruction

Intestinal obstruction	n	%
Mechanical with known cause	603	71.28
Functional	19	2.25
Indeterminate	224	26.48
Total	846	100

Table 6: Causes of stricture formation

Stricture	n	%
Tubercular (biopsy proven)	38	45.79
Non specific	44	53.01
Radiation induced	1	1.20
Total	83	100

Table 7: Location wise distribution of strictures

Stricture	n	%
Small bowel		
Ileum	56	67.47
Jejunum	12	14.46
Duodenum	1	1.20
Large bowel	14	16.87
Total	83	100

Table 8: Previous surgery as a cause of AIO

Previous surgery	n	%
Exploratory laparotomy	136	16.08
Appendectomy	34	4.02
Open cholecystectomy	14	1.65
Hernia	13	1.54
LSCS	28	3.31
Hysterectomy	26	3.07
Tubal ligation	17	2.01
Laparoscopic surgery	10	1.18
Others	2	0.24

AIO: Adhesive Intestinal Obstruction

Table 9: Type and percentage of operative treatment

Type of management	n	%
Conservative	602	71.16
Surgical		
Resection anastomosis and/or stricturoplasty (RA±S)	104	12.29
Gut exteriorized (GE)	23	2.72
Surgery for extramural obstruction (Gut intact)	112	13.24
Others	5	0.59
Total	846	100

surgeries 8.39% and appendectomy 4.02% of all cases of intestinal obstruction.

As a group, adhesions were found by far to be the most common cause of intestinal obstruction. Out of a total of 846 people considered in the study, 273 (32.27%) patients

Table 10: Frequency of complications

Complication	n	%
Expired	22	2.60
Fistula	3	0.35
Perforation	8	0.95
SSI	15	1.77
Others	12	1.42
Total	60	7.10

SSI: Surgical site infection

were a case of AIO which compares with study done by Desta Hiko *et al.* in 2014, showing adhesions as the most common cause of intestinal obstruction.^[16] Akcakaya in Turkey October 2000 noted that the most frequent cause of intestinal obstruction in the developed countries is adhesions while strangulated hernias are more common in developing countries. McEntree *et al.* 1987 found that the commonest cause of intestinal obstruction in United Kingdom was adhesions followed by neoplasms, strangulated hernias, volvulus, and fecal impaction in that order.

While analyzing the cause of previous surgery as a cause of adhesion, it was found that frequency of laparoscopic surgery in adhesion was 10 (3.57%), when compared to open cholecystectomy or open appendectomy, which were 5% and 12.14%, respectively. A meta-analysis by Li *et al.* found that there was no statistically significant difference between open versus laparoscopic adhesiolysis in the number of intraoperative bowel injuries, wound infections, or overall mortality. Conversely there was a statistically significant difference in the incidence of overall and pulmonary complications and a considerable reduction of prolonged ileus in the laparoscopic group compared with the open group. The authors concluded that laparoscopic approach is safer than the open procedure, but only in the hands of experienced laparoscopic surgeons and in selected patients.^[17]

CONCLUSION

The study shows tuberculosis appears to be the single main cause of intestinal obstruction in this part of the world. But a whole group AIO contributes the majority. A thorough clinical history and physical examination, with knowledge of the most common signs and symptoms, helps us in quickly and efficiently making a provisional diagnosis of intestinal obstruction and ordering the relevant investigations.

An abdominal X-ray was found to be the single most effective tool in the hand of a physician to confirm the clinical diagnosis of intestinal obstruction. While computed

tomography (CT) scan, preferably double contrast (unless contraindicated), helps in knowing the cause and level of obstruction along with complications such as ischemia, internal herniation, strangulation, or perforation. Hence, aids in decision making of the treatment modality.

Conservative management appears to be the most common management followed in the study done. Surgery was done in cases which either failed conservative treatment or was indicated by CT scan. But the decision remains mostly based on clinical status of the patient.

Decision of the type of surgery was taken depending on the intraoperative findings and in a few cases on age, the hemodynamic and co-morbid status of the patient. Bowel exteriorization was preferred over resection and anastomosis, if the bowel did not appear to be adequately perfused. The decision was mostly clinical done after a failed trial of 100% oxygenation and hot mop application.

The study shows SSI to be the most common complication. A review of the comorbid status shows diabetes mellitus could be a contributing factor in SSI.

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How to cite this article: Ahmed A, Jain R, Bandi A. A 10 Years Retrospective Observational Clinical Study of Intestinal Obstruction in Adults. *Int J Sci Stud* 2020;9(5):111-116.

Source of Support: Nil, **Conflicts of Interest:** None declared.