

Original Research Article

# Evaluation of etiopathological factors of intestinal obstruction and methods of prevention in a tertiary care hospital

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## Abstract

Intestinal obstruction is an emergency condition which when unrelieved at the earliest will lead to strangulation and gangrene of the bowel. The aim of this study was to find the various causes for small intestinal obstruction and methods of prevention. About 303 cases of intestinal obstruction were recorded and studied regarding the type and cause of small bowel obstruction in a tertiary care hospital. All the cases of intestinal obstruction presenting to emergency and outpatient department were admitted, excluding neonatal and paediatric cases. After initial resuscitation, patients were evaluated for the cause of obstruction, by plain X-ray abdomen and CT scan abdomen. There were 206 cases of small bowel obstruction, with 155 cases due to post operative adhesions, hysterectomy being most common earlier operation. History of multiple operations was present In 35 cases. 18 cases were managed conservatively. Diagnostic lap could be done in 11 cases with adhesiolysis. Resection and anastomosis was done in 89 cases. The mortality rate was 12.5 %. morbidity was 44% cumulatively.

## Key words

Small bowel obstruction, Cause of small bowel obstruction, Conservative management of small bowel obstruction, Morbidity and mortality of small bowel obstruction, Treatment of small bowel obstruction.

## Introduction

Acute intestinal obstruction is a catastrophic condition. Delay in treatment will result in high morbidity and mortality to the patient. This can occur in males and females and any age group, starting from neonates to elderly. The aetiology varies with the age group. We have recorded all the cases of intestinal obstruction attending our emergency department over a period of 3years and studied the causes of intestinal obstruction.

## Materials and methods

All the cases of intestinal obstruction presenting to our emergency department were admitted. Paediatric age group was excluded from the study. The age, sex, general condition, history of co-morbidities, tuberculosis and previous surgery were recorded. After Initial stabilization, patients were evaluated for the cause of obstruction with plain X-ray, CECT abdomen. Patients with subacute intestinal obstruction were initially managed conservatively with nil by mouth, ryle's tube aspiration. Emergency laparotomy was done in case of acute intestinal obstruction with gross distension, suspicion of strangulation. Definitive procedure like resection and anastomosis was done in some cases. In case of large bowel obstruction diversion colostomy followed by evaluation of cause of obstruction and later definitive surgery was done.

## Results

Age distribution of patients was as per **Table – 1**. According to sex distribution, 113 were male and 190 were female. Average time of presentation to hospital was 3.7 days (ranging from 18 hours of onset to 15 days). Average duration of symptoms was 3.7 days (ranging from 18 hours of onset to 15 days). Average time of operation since admission was 9 hours. Signs and symptoms were as per **Table – 2**. Out of 303, 155 had past history of surgeries as per **Table - 3**. Total 37 had past history of Tuberculosis and 2 had past history of Crohn's disease.

Plain X-ray abdomen and CECT abdomen revealed small bowel obstruction in 174 patients

and large bowel obstruction in 52. Colonoscopy and biopsy of colonic growths were done.

**Table – 1:** Age of patients presenting with intestinal obstruction.

Age group	Number of cases
<40 years	38
40-60 years	206
>60 years	59

**Table – 2:** Symptoms and signs.

Symptoms and signs	Frequency/Total
Pain abdomen	299/303
Vomiting	
Non Bilious	Nil/303
Bilious	279/303
Feculent	21/303
Constipation	264/303
Obstipation	62/303
Malena	29/303
Abdominal distension	271/303
Features of peritonitis	51/303
Shock	17/303

**Table – 3:** Past history of surgeries.

Past history	Frequency
Hysterectomy	85
Appendicectomy	12
Tubectomy	32
Laparotomy for lump abdomen	8
Laparotomy for pain abdomen	18
Multiple surgeries	35

18 cases of sub acute small bowel obstruction following previous surgery were managed conservatively and discharged after relief of obstruction. 206 cases were operated. Intra-operative findings were as per **Table – 4**. Procedures were done as per **Table – 5**.

Acute small bowel obstruction with gangrene/ pregangrenous changes was treated by resection and anastomosis. Ileostomy was done in patients with adhesions and gangrene of bowel and shock, and later reanastomosis done once patient

is fit (after 3 months). Diagnostic laparoscopy and adhesiolysis was done in 10 cases.

**Table – 4:** Intra-operative findings.

Intra-operative findings	Frequency
<b>Small bowel obstruction</b>	<b>206</b>
Adhesions	142
Tuberculosis	15
Crohn's disease	2
Strictures	18
Obstructed hernia	27
Ileosigmoid knotting	3
<b>Large bowel</b>	<b>79</b>
Sigmoid volvulus	29
Malignancy	37
Adhesions	13

**Table – 5:** Procedures done.

Procedures	Frequency
Primary anastomosis	82
Ileostomy	18
Colostomy	49
Adhesiolysis	124
Stricturoplasty	20

Large bowel obstruction due to malignancy were all treated initially with diversion colostomy and later after preparation of colon and patient, resection and anastomosis was done. Post-operative complications were as per **Table – 6**. Mortality rate was 12.5% (38 cases).

**Table – 6:** Post operative complications.

Post-operative complications	Frequency (%)
Wound infections	34 (11.22%)
Electrolyte imbalance	61 (20.1%)
Wound dehiscence	4 (1.3%)
Pneumonia	26 (8.5%)
Fistula/ Anastomotic leak	11 (3.63%)

## Discussion

Intestinal obstruction is one of the common causes of acute abdomen, presenting to ER. It can have a varied aetiology. The aim of this study was to find the causes of acute intestinal obstruction and methods of prevention. Over a

period of 3 years, 303 cases of intestinal obstruction were recorded in our institute.

Pain abdomen, distension of abdomen and bilious vomiting are the common mode of presentation of small bowel obstruction. The distension of abdomen varies depending on the level of obstruction, duration and degree of obstruction. High jejunal level of obstruction presented with less distension and early vomiting of dark green bile. Low ileal obstruction present with more distension followed by yellow bile and feculent vomiting. The vomiting will be preceded by colicky abdominal pain and borborygmi. The mean age of presentation varied from 40 to 60 years (206/303 cases) 67.9%. Females were more often affected than males (190/303)62.7%. This is because of previous surgeries in females, most common being hysterectomy.

Features of peritonitis at presentation were seen in-51/303 and Shock - 17/303. Intestinal obstruction results in sequestration of fluid in the bowel lumen due to obstruction to peristaltic wave and failure of absorption of fluid from bowel wall. There is proliferation of luminal bacteria and mucosal transmigration of endotoxins resulting in systemic inflammatory response syndrome, multiple organ failure. Distension of bowel leads to ischemia, which starts on antimesenteric border and at the site of constriction. Perforation of bowel, peritonitis and septic shock occur if there is delay in diagnosis and treatment, increasing the morbidity and mortality of the patient [1-4].

All the patients should be initially stabilized even before investigating the cause of obstruction. Patients coming from remote areas may be in compensatory state of septic shock due to ileus and perforation and peritonitis. In our study, average time of presentation to hospital was 3.7 days (18 hours of onset to 15 days). Ryle's tube aspiration, intravenous fluids, antibiotics should be started. Type and cause of obstruction should be evaluated [5].

The pattern of bowel gas shadows in plain X-ray abdomen would indicate whether small bowel or

large bowel obstruction. The sensitivity of plain X ray abdomen to evaluate sub acute intestinal obstruction is 75-80%.

CT abdomen would throw light in cases of sub acute intestinal obstruction with or without relief with conservative management or large bowel obstruction suspicious of malignancy. The sensitivity rate of CECT abdomen is 85-90% for subacute intestinal obstruction and 95-100% for strangulated bowel. Serrated beak appearance, decreased mesenteric vasculature reduced bowel wall enhancement mesenteric edema would suggest strangulation [9, 10].

Sub acute intestinal obstruction in all patients with scar on abdomen should be initially managed conservatively as repeated surgeries and scars would worsen the condition [5-8, 11, 12]. In our study, 18 cases of sub acute small bowel obstruction following previous surgery were managed conservatively and discharged after relief of obstruction. 206 cases (67.98%) were operated. Exploratory laparotomy revealed adhesions in 155cases of (68.93%) postoperative small bowel obstruction.

The surgeries that were performed were hysterectomy, tubectomy, appendectomy, laparotomies for pain abdomen, lump abdomen. The incisions were subumbilical, supra umbilical pfennensteil, Mcburney's and right paramedian.

Tsumura classified the different locations of obstructive band adhesions and estimated their frequency: anterior visceroparietal (40%), anterior visceroparietal adhesions associated to viscerovisceral adhesions (small bowel) (32%), viscerovisceral adhesions (small bowel) (16%), posterior visceroparietal adhesions (between posterior peritoneum and small bowel) (8%), anterior and posterior visceroparietal adhesions associated to viscerovisceral adhesions (4%) [20, 21].

Out of 155 cases of postoperative adhesions, in our study, the adhesions were mostly inter loop and parietes to bowel adhesions .In these cases,

after laparotomy, adhesiolysis was done. In cases where there was gangrene/ perforation, resection and end to end anastomosis was done (82) cases. In patients with dense adhesions and where inability to identify the loop in continuity or in unstable patients - ileostomy was done.

In 27 cases of obstructed hernias release of adhesions and division of neck of sac and reduction of viable loop was done in 20 cases and resection of gangrenous loop was done in 7 cases.

In cases of subacute intestinal obstruction not relieved with conservative management, diagnostic laparoscopy followed by laparoscopic adhesiolysis can be attempted [12, 13]. This would avoid another incision and recurrence of adhesions. We have done diagnostic laparoscopy in 10 but converted to open procedure as the adhesions were dense in 5 cases

In tuberculous abdomen no definitive procedure was attempted, but for a biopsy and abdomen was closed. Patient was started on anti tuberculous treatment. Post operative period was turbulent in cases of bowel gangrene and perforation

In our study most common cause of small bowel obstruction was due to post operative adhesions. When analysed, Post operative adhesions were common in patients with- intra abdominal sepsis, prolonged surgery, multiple surgeries and post operative wound infections. Placement of drains for a long period also attracts adhesion of omentum to parietes and bowel loops.

Raw areas and rough handling of tissues are also attributed as causes of adhesions. Inflammatory bowel diseases like Crohn's disease, tuberculosis produce dense adhesions, ulceration and strictures of small bowel. Intra abdominal malignancy also results in infiltration and obstruction. Malignancy coupled with radiation therapy further increases the risk of developing Small Bowel Obstruction

### Methods for prevention of adhesions

Thus intra abdominal adhesions should be avoided or minimized to reduce morbidity and future obstruction (to some extent) in a patient undergoing surgery.

- Intra abdominal sepsis like appendicitis, hollow viscus perforation & peritonitis, pelvic inflammatory disease, tuberculosis etc, should be recognized early and treated.
- Gentle handling of tissues should be advocated and taught to all the residents [11].
- Strict adherence to the basic surgical principles of minimizing tissue trauma with meticulous haemostasis, minimization of ischemia and desiccation, and prevention of infection and foreign body retention [22].
- Thorough lavage of peritoneal cavity should be done when there is spillage of blood and body fluids into peritoneal cavity.
- Multiple surgeries are to be avoided [14].
- Minimally invasive approach should be adopted where ever possible [15, 16, 17].
- Anti adhesive films also can be used in the face of danger of adhesions like multiple pre existing adhesions. (Interseed, e PTFE, seprafilm, sodium hyaluronidase) [18, 19].

### Conclusion

Cases of Intestinal obstruction are a common presentation in emergency department. These can occur with varied aetiology. Small intestinal obstruction is more common than large intestine obstruction. The clinical presentation can vary from subacute obstruction to acute strangulation, gangrene, perforation and peritonitis. Immediate diagnosis and resuscitation should be carried out to reduce morbidity. Plain X-ray is 75-80% sensitive in diagnosing obstruction where as CECT abdomen is 95-100% sensitive. With CECT abdomen, cause and site of obstruction can be known. The most common cause of small intestine obstruction is post operative adhesions,

followed by obstructive hernias, inflammatory bowel disease and intra abdominal malignancies. Initially conservative management can be tried in subacute cases. As the intestinal obstruction is mostly due to post operative adhesions, all precautions to minimize adhesions should be followed. Early recognition of intra abdominal sepsis, gentle handling of tissues, avoiding raw areas should be adopted. Minimal access surgery should be advocated where ever possible. Multiple surgeries are to be avoided. Wide spread use of methods like non adhesive films may be adopted when there is definite risk of adhesions.

### References

1. Wright HK, O'Brien JJ, Tilson MD. Water absorption in experimental closed segment obstruction of the ileum in man. *Am J Surg.*, 1971; 121(1): 96-99.
2. Wangenstein OH. Understanding the bowel obstruction problem. *Am J Surg.*, 1978; 135(2): 131-149.
3. Rana SV, Bhardwaj SB. Small intestinal bacterial overgrowth. *Scand J Gastroenterol.*, 2008; 43(9): 1030-1037.
4. Stoker J, van Randen A, Laméris W, Boermeester MA. Imaging patients with acute abdominal pain. *Radiology*, 2009; 253(1): 31-46.
5. Suri S, Gupta S, Sudhakar PJ, Venkataramu NK, Sood B, Wig JD. Comparative evaluation of plain films, ultrasound, and CT in the diagnosis of intestinal obstruction. *Acta Radiol.*, 1999; 40(4): 422-428.
6. Patrick G. Jackson, Manish Raiji. Evaluation and Management of Intestinal Obstruction. *Am Fam Physician.*, 2011; 83(2): 159-165.
7. Williams SB, Greenspon J, Young HA, Orkin BA. Small bowel obstruction: conservative vs. surgical management. *Dis Colon Rectum*, 2005; 48(6): 1140-1146.
8. Cox MR, Gunn IF, Eastman MC, Hunt RF, Heinz AW. The safety and duration

- of non-operative treatment for adhesive small bowel obstruction. *Aust N Z J Surg.*, 1993; 63(5): 367–371.
9. Lower AM, Hawthorn RJ, Ellis H, et al. The impact of adhesions on hospital readmissions over ten years after 8849 open gynecological operations: an assessment from the Surgical and Clinical Adhesions Research Study. *BJOG*, 2000; 107: 855.
  10. Ouaiissi M, Gaujoux S, Veyrie N, et al. Post-operative adhesions after digestive surgery: their incidence and prevention: review of the literature. *J Visc Surg.*, 2012; 149: e104.
  11. Barmparas G, Branco BC, Schnüriger B, et al. The incidence and risk factors of post-laparotomy adhesive small bowel obstruction. *J Gastrointest Surg.*, 2010; 14: 1619.
  12. Schreinemacher MH, ten Broek RP, Bakkum EA, et al. Adhesion awareness: a national survey of surgeons. *World J Surg.*, 2010; 34: 2805.
  13. Chen SC, Yen ZS, Lee CC, et al. Nonsurgical management of partial adhesive small-bowel obstruction with oral therapy: a randomized controlled trial. *CMAJ*, 2005; 173(10): 1165–1169.
  14. Mosley JG, Shoab A. Operative versus conservative management of adhesional intestinal obstruction. *Br J Surg.*, 2000; 87(3): 362–373.
  15. Dallemagne B. Small bowel obstruction and adhesiolysis. In *Laparoscopic surgery* Edited by: Cueto-Garcia J, Jacobs M, Gagner M. McGraw-Hill Companies, New York; 2003, p. 301-03.
  16. Reissman P, Wexner SD. Laparoscopic surgery for intestinal obstruction. *Surg Endosc.*, 1995; 9: 865-68.
  17. Duron J. Laparoscopic treatment of small bowel obstruction. *Adhesion*, 2002; 5: 16-19.
  18. Wiseman DM, Trout JR, Franklin RR, Diamond MP. Metaanalysis of the safety and efficacy of an adhesion barrier (Interceed TC7) in laparotomy. *J Reprod Med.*, 1999; 44: 325–331.
  19. Arshad M Malik, Madiha Shah, Rafique Pathan, Krishan Sufi. Pattern of acute intestinal obstruction: Is There a change in the underlying etiology? *Liaquat University of Medical & Health Sciences*, 2010; 16(4): 272-274.
  20. Tsumara H. Laparoscopic treatment of small bowel obstruction. *Adhesion*, 2006; 9: 17-19.
  21. Eriberto Farinella, Roberto Cirocchi, et al. Feasibility of laparoscopy for small bowel obstruction. *World Journal of Emergency Surgery*, 2009; 4: 3.
  22. Víctor Hugo González-Quintero, Francisco E Cruz-Pachano. Preventing Adhesions in Obstetric and Gynecologic Surgical Procedures. *Rev Obstet Gynecol.*, 2009; 2(1): 38–45.