

Comparative Study of Large and Small Intestinal Obstruction

¹Dr. G. Lakshmi Narayana, ²Dr. Deepak Sharma

¹Professor of Surgery, Malla Reddy Medical College
for Women, Hyderabad

²Associate Professor of Surgery, Malla Reddy Medical College
for Women, Hyderabad

Abstract: *The mortality rate of intestinal obstruction is as high as 30% in spite of extensive research and studies done till now. The recognition and treatment of strangulating intestinal obstruction in time remains an important problem for surgeons today. Success in the treatment of acute intestinal obstruction depends upon early diagnosis and proper management. The objective was to study the age and sex distribution of intestinal obstruction and to compare the small and large bowel obstruction, to study the etiology of presentation of both small and large intestinal obstruction, to study the incidence of strangulation, and to study the mortality rate. Total of fifty patients attended our casualty and diagnosed as acute intestinal obstruction and operated are included in this study. Diagnosis is done pre-operatively as Acute Intestinal Obstruction with the guidance of clinical and radiological and biochemical parameters. A proforma is prepared, which includes the details of patients name, age, sex, IP.No, symptoms, pre op diagnosis, operative procedures, complications and death. Small bowel obstruction was the common cause of obstruction with 72% of the cases compared to 28% due to large bowel obstruction. Males were affected more with nearly twice the number of patients compared to females. Bands and adhesions were the most common cause of intestinal obstruction with 42%, then tumors with 14%, and then sigmoid volvulus seen in 12% of the cases.*

Keywords: mortality rate, intestinal obstruction, research

1. Introduction

Intestinal obstruction is defined as a partial or complete interference with the passage of stools distally in the intestine. Hippocrates observed and treated intestinal obstruction. According to Campbell et al (1956)¹, commonest cause of large bowel obstruction is colonic carcinoma, followed by volvulus of sigmoid and diverticular disease. According to Sukumar et al (1986)² chief cause of acute large bowel obstruction is sigmoid volvulus and second is carcinoma of the colon. Intestinal obstruction constitutes 10% of all emergency surgical procedures in our hospital. Out of them Strangulated bowel is seen in 10% of these cases.

Radiographic techniques for the diagnosis of intestinal obstruction were developed during the second decade of twentieth century, which made earlier and better diagnosis of intestinal obstruction possible. Nasogastric or Intestinal tubes^{3,4} were employed in 1930's initially to relieve intestinal obstruction and later in 1940's and 1950's antibiotics were added to treatment. Replacement of fluids, intestinal decompression, antibiotics and improvement in surgical and anaesthetic technique has reduced the mortality in simple and strangulated intestinal obstruction.

Success in the treatment of acute intestinal obstruction depends upon early diagnosis and proper management. In cases with late presentation of intestinal obstruction, relieving obstruction alone is not enough to avoid a fatal issue, because the bowel which is distended becomes irreparably damaged and systemic effects will be obvious by that time.

This study was conducted with the objective find out causes of intestinal obstruction, various symptoms patients present with

intestinal obstruction, relationship with symptoms and chances of strangulation, overall mortality.

2. MATERIAL & METHODS

- This study is conducted at Chalmeda Anandrao Institute of Medical Sciences (CAIMS), karimnagar, during the period of 2012 August to 2014 August.
- Total of fifty patients attended our casualty and diagnosed as acute intestinal obstruction and operated are included in this study.
- Diagnosis is done pre-operatively as Acute Intestinal Obstruction with the guidance of clinical and radiological and biochemical parameters.
- A proforma is prepared, which includes the details of patients name, age, sex, IP.No, symptoms, pre op diagnosis, operative procedures, complications and death.
-

INCLUSION CRITERIA

- All patients who come to CAIMS with pain abdomen and diagnosed as acute intestinal obstruction and got operated.
- Age 12 yrs or more
- Both male and females

EXCLUSION CRITERIA

Intestinal obstruction cases managed conservatively.

3. RESULTS AND DISCUSSION

Out of 50 cases of intestinal obstruction operated over a period of 2 years, 19 cases were found to be gangrenous, giving the incidence of 38% of all cases of intestinal obstruction. This figure is rather high when compared to western reports. Waldrom and Hompton 16% in 480 cases, Smith et al 8.1% in 1208 cases but compared almost same with other Indian workers like Gill of Ludhiana 22% in seeking medical advice. Most likely cause of more number of cases with gangrene could be due to delayed presentation. Other possibility is that this hospital is a tertiary care center, so the complicated patients are referred here when those are not able to be managed in peripheral or small hospitals.

FEATURES OF GANGRENE BOWEL

In all the cases, pain abdomen, constipation, vomiting, sometimes bloody stools were the common symptoms. Fever, tachycardia, abdominal tenderness, muscle guarding and leucocytosis were the features.

All the cases should undergo an emergency resection and end to end anastomosis or exteriorization and distal stump closure consequently. All the patients were given blood transfusion when necessary, pre and post operative broad spectrum antibiotics. Shock and peripheral circulatory failure is most likely the cause of death in such patients.

In case of strangulation ileus, both venous and arterial circulation of the intestines could be disturbed. Mucosal bleeding and thrombosis leads to ischemia, which easily causes bacterial translocation and leakage of the metabolites of ischemia into the circulation and the abdominal cavity. Such a situation can lead to sepsis and multiple organ failure.³¹ This condition signifies the importance of taking special care to distinguish intestinal strangulation from simple obstruction.^{33,34}

Table 1. Percentage of gangrene comparison with other studies

	SMITH et al	WALDRON HOMPTION	GILL LUDHIANA	PRESENT SERIES
Total cases of Intestinal Obstruction	1208	481	147	19
% of Gangrene Bowel	41	16	22	38

CLINICAL FEATURES

The most common presenting feature was pain abdomen. Next common symptoms were constipation and abdominal distention. With regard to signs abdominal tenderness was present in almost all cases. Next common symptom is being tachycardia and then raised temperature. Muscle guarding and raised temperature suggests strangulation. The diagnosis of intestinal strangulation is entirely made by clinical methods.⁸

FEVER:

The guidelines provided by Harold Lefall (USA, 1972) read “an elevated body temperature in the presence of symptoms of intestinal obstruction may be interpreted as a sign of intestinal

strangulation “. Body temperature more than 102°F with features of obstruction raises the suspicion of strangulation.

When the temperature is below 100°F the outcome is good, whereas when the body temperature crosses 103°F the results are poor. The patient with high body temperature of short duration is critically ill and required early surgery than the patient with long duration with no fever, whose prognosis is better.

TIME RELATION WITH CLINICAL FEATURES

The time interval between onset of symptoms and arrival to the hospital admission and surgical intervention was noted and these figures were compared with the mortality rates. 70% of cases reported after 48 hours where death rate was as high as 25%, excluding malignant conditions which present with longer history. 30% of cases who reported after less than 48 hours had the death rate of 9% , showing the importance of immediate surgical intervention. Except in cases of injuries, in all the other cases a minimum of 36 hours was the time before seeking medical advice. When the patient was resuscitated well pre operatively with gastric decompression, intravenous fluids and antibiotics, time delay of a few hours has not been observed to increase the mortality (H.M.Delany 1972)

Table 2. Symptoms and signs comparison with other studies

SYMPTOMS AND SIGNS	% IN PRESENT STUDY	% IN LEFALL ET AL 1985
SYMPTOMS :		
Pain Abdomen	100	63
Vomiting	86	60
Abdominal Distension	94	43
Constipation	98	29
Fever	56	55
SIGNS :		
Abdominal Tenderness	100	82
Muscle guarding	38	29
Raised body temperature	56	64
Tachycardia	60	78
Shock state	10	24

In another study done by Murat Kapan et all in 2012, presentation of symptoms and signs analysis shown that, patients with acute intestinal obstruction most commonly present with pain abdomen and abdominal distension, and most consistent signs are tenderness and increase in bowel sounds. Comparison of the study results with current study is shown below.³⁵

Table 3. Symptoms and signs comparison with other studies

SYMPTOMS AND SIGNS	% IN STUDY	PRESENT	% Murat Kapan et all in 2012
SYMPTOMS :			
Pain Abdomen		100	100
Vomiting		86	
Abdominal Distension		94	
Constipation		98	
SIGNS :			
Abdominal Tenderness		100	93
Muscle guarding		38	
Raised body temperature		56	30
Tachycardia		60	
Increased bowel sounds		---	64
			--
			72

ETIOLOGY

Studying it cause wise, the incidence of Bands and Adhesions is very high followed by volvulus then tumors. Rarest among the rest are Mesenteric vascular lesions and Meckel's diverticulum with band, which is at marked variance with Western literature, where after strangulated external hernia and bands, Mesenteric vascular disease is the commonest cause (L.D. Lefall et al 1965), (H.M.Delany et al 1972) and (Saltzstein marshall et al 1962). It is reported that the obstruction secondary to small bowel disease are responsible for the 67.8 - 80% of the total obstruction cases, while large bowel causes form only part of 20 - 30%.^{36,37,38} The most common causes of Acute mechanical intestinal obstruction are adhesions, incarcerated hernias and large bowel cancer.^{34,36,38,39,40,41} Another study reported that the most common three causes of Malignant bowel obstruction were adhesions (45.5%), colon tumors (21.6%) and sigmoid colon torsion (7.4%)⁴².

Table 4. Etiological causes comparison with other studies

S. No	Aetiology	Turner & Judd Myoclinic (1950)	Wagenstein (1953)	Jain & Prasad Gwalior (1960)	CMC Ludhiana (1985)	Present Series (2012-14)
1	Adhesions	41	30	35	35	21
2	Tumours	30	27	10.5	5	7
3	Congenital	2	7.1	-	6.8	-
4	Volvulus	7	13.4	22.3	24.5	9
5	Intussusception	3	2.8	15.3	12.2	-
6	Vascular	-	-	-	4.4	1
7	Crohn's Disease	-	3.8	-	4.1	-
8	Meckel's	-	-	-	-	2
9	Tuberculosis	-	-	9.4	3.4	3
10	Others	4	5.6	7.2	5.4	7
	Total Cases	87	1252	170	147	50

Below is another comparison chart, which is showing adhesions or band as the leading cause of obstruction. Second most common cause is variable in various studies. The reason for this may be because these studies were conducted in various time periods and different locations.

Table 5. Etiological causes comparison with other studies

Causes of intestinal obstruction	Saltz's tenzin Marshal et al 1962	Bansali Sethana Bombay 1963-67	Lafall Joseph et al 1985	Harry delany et al 1992	Present cases 2012-14
1.Small bowel volvulus	7	6	-	3	1
2.Intussusception	6	1	4	-	-
3.Sigmoid volvulus	4	4	2	3	6
4.Meckel's diverticulum and band	-	-	-	-	2
5.Adhesive bands	4	36	20	29	21
6.Mesenteric Vascular disease	6	8	26	1	1
7.Round worms	3	-	-	-	-
8.Injuries & others	2	4	4	-	-
TOTAL	32	59	56	36	31

MORTALITY RATE

Halis et al⁴³.reported that tachycardia, leukocytosis/ leucopenia, comorbidity was the efficient factors on morbidity, while the presences of strangulation, the duration of symptoms, and advanced age was reported by Akgun et al.⁴⁴ In previous studies, it is reported that the mortality rates in malignant bowel obstruction varies between 1.5% - 11.5%.^{45,46} Patients presenting in shock, with carcinomatosis, ascites, or palpable mass have a 54% to 100 % mortality⁴⁷. Mortality from surgery may approach 30% hence careful clinical judgment must be exercised and involving other disciplines and family is advisable.^{48,49,50}

Total cases underwent the Surgery : 50

Patients expired : 8

Mortality rate : 16%

Mortality rate in this study comparing to other studies is little lower. The reason could be inclusion of less severe cases in other studies. Other reason could be because those other studies were old, and after that period, there are better fluid management strategies, better antibiotics, and advanced life support management developed to decrease mortality.

Table 6. Mortality comparison with other studies

	Bansal Sethna et al (1969)	Harry M.Delany et al (1972)	Lafall Josep et al (1985)	Present Series(2012-14)
Mortality	53%	35%	30.7%	16%
Cases Studied	41	94	52	50

COMPARISON OF MORTALITY WITH INDIVIDUAL DIEASES

Comparing to other studies both the sigmoid volvulus and adhesive bands have less mortality rate and better prognosis seen in cases operated in the hospital. Mesenteric vascular disease is high fatality in almost all studies.

Table 7. Mortality comparison with other studies

LESIONS	SALTZSTEIN et al (1972)	H.M. DELANY et al (1962)	LAFAL L et al (1985)	Present series 2009-11
Sigmoid volvulus	100%	-	-	16%
Intussusception	-	40%	-	-
Adhesive bands	30.6%	30%	14%	4%
Mesenteric Vascular disease	75%	75%	100%	100%

SHOCK

The most valuable guide in predicting the diagnosis as well as indicating the prognosis in intestinal obstruction was the shock state (Harold Lauffman et al 1962). Here systolic blood pressure must be below 90 mm of Hg and pulse rate should be more than 100/min.

In this study out of 50 cases only 5 cases are in the state of shock peri-operatively. Of these, only one case could be resuscitated, rest all expired. According to HM Delany, Mortality rate in patients with preoperative Shock was 80%.

Some of the patients responded dramatically immediately after clamping of the gangrenous segment of the bowel. A great physiological problem arises when the shocked patient does not respond to fluid and blood transfusion and in such cases use of vasopressors is indicated. Absorption of toxins may be the reason for development of Shock. In such cases removal of the offending lesion remains the only solution to this problem.

4. CONCLUSION:

- Bands and adhesions were the most common cause of intestinal obstruction with 42%, then tumors with 14%, and then sigmoid volvulus seen in 12% of the cases.
- Mortality seen more in middle aged and older people compared to younger people in both small and large bowel obstruction.
- Intestinal gangrene was seen more in small bowel obstruction with 28% and 10% in large bowel obstruction with adhesive bands being the most common cause.
- Abdominal pain, tenderness, vomiting, distension and constipation were the most common features of intestinal obstruction with vomiting and pain as prominent symptoms in small bowel obstruction and distension and constipation were more common in large bowel obstruction.
- Out of 50 cases the mortality rate was 16%. Shock was associated with a high mortality in both small and large intestinal obstruction. Mortality was seen more in small bowel obstruction cases with 20.6% of the cases and with large bowel obstruction was 15.3%.
- In 19 cases of gangrene bowel the mortality rate was 38%. Gangrene bowel was seen more in small bowel obstruction with 14 cases and 5 cases were with large bowel obstruction.

REFERENCES

- [1] Campbell J.A.Gunn A.A. et al: acute obstruction of colon. JR. Coll. Surg. edinib. 1956. 1:231,
- [2] A.Sukumar et al:Sigmoid volvulus.Ind.J.Surg.1986.48.84-88
- [3] Gowen GF.Long tube decompression is successful in 90% of patients With adhesive small bowel obstruction. Am J Surg 2003 185;512-515.
- [4] Brolin RE. The role of gastro intestinal tube decompression in the treatment of mechanical intestinal obstruction. Am Surg 1983;49;131- 137.
- [5] Adhikari Souvik, Mohammed Zahid Hossein, Das Amitabha, Mitra Nilanjan,¹ and Ray Udipta, Etiology and Outcome of Acute Intestinal Obstruction: A Review of 367 Patients in Eastern India, Saudi J Gastroenterol. Oct 2010; 16(4): 285–287.
- [6] Richards WO, Williams LF Jr. Obstruction of the large and small intestine. Surg Clin North Am 1988;68:355-76.
- [7] Renzulli P, Krähenbühl L, Sadowski C, al-Adili F, Maurer CA, Büchler MW. Modern diagnostic strategy in ileus. Zentralbl Chir 1998;123:1334-9
- [8] Bailey and Love's Short Practice of Surgery 25th ed. published in 2008 by Hodder Arnold P.1154-1158, 1888, 1889, 1190-1193,1196,1202.
- [9] Murat Kapana, b, Akin Ondera, Serkan Polata, Ibrahim Aliosmanoglua, Zulfu Arianoglua, Fatih Taskesena, Sadullah Girgina Mechanical Bowel Obstruction and Related Risk Factors on Morbidity and Mortality, J Curr Surg • 2012;2(2):55-61
- [10] Fevang BT, Fevang J, Stangeland L, Soreide O, Svanes K, Viste A. Complications and death after surgical treatment of small bowel obstruction: A 35-year institutional experience. Ann Surg. 2000;231(4):529-537.
- [11] Uludag M, Akgun I, Yetkin G, Kebudi A, Isgor A, Sener A. [Factors affecting morbidity and mortality in mechanical intestinal obstruction]. Ulus Travma Acil Cerrahi Derg. 2004;10(3):177-184.
- [12] Wysocki A, Krzywon J. [Causes of intestinal obstruction]. Przegł Lek. 2001;58(6):507-508.
- [13] Miller G, Boman J, Shrier I, Gordon PH. Natural history of patients with adhesive small bowel obstruction. Br J Surg 2000;87:1240-7.
- [14] Ihedioha U, Alani A, Modak P, Chong P, O'Dwyer PJ. Hernias are the most common cause of strangulation in patients presenting with small bowel obstruction. Hernia 2006;10:338-40.
- [15] Lawal OO, Olayinka OS, Bankole JO. Spectrum of causes of intestinal obstruction in adult Nigerian patients. S Afr J Surg 2005;43:34, 36.
- [16] Hasan Fehmi, Hasan Ediz SIKAR, Acute mechanical intestinal obstructions, Turkish Journal of Trauma & Emergency Surgery 2010;16 (4):349-352
- [17] Halis N, Söğüt Ö, Güloğlu C, Özgönül A, Gökdemir MT, Durgun HM. Factors associated with morbidity and mortality in patients with mechanical bowel obstruction. JAEM 2011 (doi:10.5152/jaem.2011.076)
- [18] Akgun Y, Yılmaz G, Akbayın H. Causes and Effective Factors on Mortality of Intestinal Obstruction in the South East Anatolia. Turk J Med Sci 2002; 32: 149-154
- [19] Akcakaya A, Sahin M, Coskun A, Demiray S. Comparison of mechanical bowel obstruction cases of intra-abdominal tumor and non-tumoral origin. World J Surg. 2006;30(7):1295-1299.
- [20] Williams SB, Greenspon J, Young HA, Orkin BA. Small bowel obstruction: conservative vs. surgical management. Dis Colon Rectum. 2005;48(6):1140-1146.
- [21] M. N Kulaylat and R. J Doerr. Surgical Treatment: Evidence-Based and Problem Oriented Munich: Department of Surgical Onkology, Buffalo General Hospital, State University of New York at Buffalo, N.Y., U.S.A. 2001
- [22] Ripamonti C, Mercadante S. Pathophysiology and management of malignant bowel obstruction. In: Doyle D, Hanks G, Cherny NI, Calman K, editors. Oxford Textbook of Palliative Medicine. 3rd ed. New York, New York Oxford University Press Inc., New York 2005. p. 496-507.
- [23] Downing GM. Bowel Obstruction. In: Downing GM, Wainwright W, editors. Medical Care of the Dying. 4th ed. Victoria, B.C. Canada: Victoria Hospice Society Learning Centre for Palliative Care; 2006. p. 333-9.
- Brooksbank MA, Game PA, Ashby MA. Palliative venting gastrostomy in malignant intestinal obstruction. Palliative Medicine. 2002;16:520-6.