

Management Outcome of Small Intestinal Obstruction in Mizan Aman General Hospital, Ethiopia

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Abstract

Background: Small intestinal obstruction is defined as any hindrance to the passage of small intestinal contents. It is one of the most common causes of acute abdomen. If not treated on timely manner the outcome will be bad. The causes are varying from region to region, as well as from season to season. Knowing this variety helps us for appropriate management. Most of the time, it is difficult to differentiate these causes clinically. So it is important to know the commonest cause in our area. The objective of this research was to assess the causes and management outcome of small intestinal obstruction among patients admitted with acute abdomen in the hospital.

Methods: A retrospective cross-sectional study design was conducted during a period between January 1, 2012 to December 30, 2014. Data was collected from patients' medical record charts and operation registration book of patients admitted to surgical ward with the diagnosis of intestinal obstruction. All the cases found in the study period and who are eligible were included in the study. One hundred twenty six of patient charts were analyzed.

Results: Over the course of three years there were 297 patients with intestinal obstruction Admitted to Mizan Aman General Hospital, From which 157 (53%) were small bowel obstruction. The male to female ratio was 2.15:1. The ages ranged from 2 years to 65 years with and a mean age of 28.45 years with standard division of 13.04years. The leading cause of obstruction was adhesion in 48 (47%) patients followed by small bowel volvulus in 34 (33, 3%). Hernia was third in 7 (6.9%). Bowel resection rate was at 40.2%. Length of stay ranged from 4 days-23 days with a mean of 9.39 days and standard division of 4.024 days. The commonest complication was wound infection (21.7%). Complication and Mortality rates were 37.3% and 9.52% respectively.

Conclusion: Adhesion was the leading cause of obstruction followed by small bowel volvulus. There is a lower morbidity and mortality rates in our study which can be explained by improvement in post-operative care. There are few causes of obstruction caused by external hernia which means hernias are being repaired electively before causing obstruction. Early diagnosis, adequate preoperative resuscitation and proper post-operative care would help to reduce further the observed mortality. This could be achieved by increasing public awareness on clinical features of intestinal obstruction as well as by improving the knowledge of mid and lower level health professionals on the diagnosis, resuscitation and importance of early referral to higher center. Moreover, health facilities capable of handling patients with intestinal obstruction should be available within the reach of the community. External hernias should always be repaired before strangulation and obstruction.

Keywords: Small bowel obstruction; Adhesion; Primary small bowel volvulus; Hernia; Gangrenous bowel

Introduction

Small Intestinal obstruction is defined as any hindrance to the passage of small intestinal contents. It is one of the most common conditions resulting in to hospital admissions. The clinical features of small intestinal obstruction include abdominal pain; distension, vomiting and absolute constipation [1].

There are two types of small intestinal obstruction. These are Dynamic (mechanical) and adynamic (paralytic ileus) intestinal obstruction. In dynamic intestinal obstruction peristalsis works against the mechanical obstruction, while in adynamic intestinal obstruction peristalsis may be absent or it may be present in non-propulsive form [2]. Mechanical intestinal obstructions, forms important part of pathologies that necessitate emergency surgical interventions in parts of Asia, including India, Iran and Pakistan [2,3]. Mechanical obstruction with certain exception, relieved on conservative treatment, unrelieved obstruction needs exploration [3].

The outcome of management of the condition may be a good indicator of how well a country's surgical services are doing. Small Intestinal obstruction is one of the commonest abdominal surgical emergencies. When small intestinal obstruction is not relieved in time, the patient may die. Early diagnosis and prompt management are therefore mandatory. Several factors contribute to poor outcomes in the

case of small intestinal obstruction. Some of these determinants may include poor health seeking behaviour, ignorance and poverty. Poor clinical judgment is also one of the negative factors leading to poor prognosis in case of small intestinal obstruction [2,3].

There is a wide geographical variation in the pattern of mechanical intestinal obstruction. The present study, adhesion ranked the highest. The most common predisposition to adhesive obstruction is violation of the peritoneal cavity and the majority of our cases followed laparotomy. It is possible that talc or starch of the surgical gloves in routine use in our environment played a role in adhesion formation in some of our patients [4].

Primary small bowel volvulus is one of the commonest causes of small intestinal obstruction in parts of Africa. Primary small bowel

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volvulus was more during the rainy seasons, that is, through June to October [5,6]. Therefore regular research should be done to evaluate these causes and strategy should be made to deal with them. In Ethiopia, little is known about the prevalence and causes of small intestinal obstruction and needs prospective study.

Methods

Retrospective cross sectional study design was used to collect a data from patients' medical record charts and operation registration book of patients admitted to surgical ward with the diagnosis of intestinal obstruction within three years (from January 1, 2012, to December 30, 2014). The supervisors and data collectors were trained before data collection. The collected data was checked for any inconsistencies, coded and fed in to SPSS version 20.1 for windows for data processing and analysis. Chi-square and p-value used to determine association between variables and p-value<0.05 considered significant. Descriptive and binary logistic regression analyses were used. P-value <0.25 in Bivariate logistic regression were a candidate for multivariate regression analysis.

Results

Over the course of three years of study there were 1163 acute abdomen cases admitted to the hospital. Among which 297 (25%) were due to intestinal obstruction. Small bowel obstruction was 13.5% among patient with acute abdomen, and 53% among patients intestinal obstruction.

From 157 patients with small bowel obstruction 126 (80%) of patients were analyzed because 31(20%) of the charts were either incomplete or lost.

The mean age is 28.45 years with standard diversion of 13.04 years and ranges from 2 year to 65 years. The male to female ratio is 2.15:1. Majority 98 (68.3 %) Of the patients are from rural area (Table 1).

Almost half of cases came after 24 hours of their illness and 44 (34.9%) arrive after they have developed complications.

The most preoperative complication which was seen was hypovolemic shock, which was found in 22 (19.8%) of the patients up on arrival. Forty eight patients (38.1%) of the patients had previous abdominal surgery. Fourteen patients (29.2%) of them were operated for large bowel obstruction. Others were operated for Small Bowel Obstruction (SBO), trauma and others. As we can also see from Figure 1 below adhesion is more common in patients who have previous abdominal surgery (Table 2) (Figure 1).

Nineteen percent (n=24) of them were responded to conservative management. Out of 50 patients who diagnosed to have small bowel obstruction do to adhesion 18 cases (36%) responded to conservative method. All causes due to hernia were operated. Five cases (9.4%) with small bowel volvulus responded to conservative management (Table 3).

In our study, the leading cause of small bowel obstruction was adhesion followed by volvulus, external hernia and ascariasis. The condition of the bowel in 41.2 % (n=42) cases was gangrenous. Interestingly almost half of the patients presented longer than 24 hours had a gangrenous bowel. The most common procedure done is resection and anastomosis followed by adhesion releases and de rotation. Resection and anastomosis rate in this study was 40.25%.

Out of 102 operated patients, 37.3% (n=38) cases developed post-operative complication. More than half of the complication were surgical site infection which accounted 57.9% (n=22) patients.

Variable	Category	Frequency	Percent
Sex	Male	86	68.3
	Female	40	31.7
	Total	126	100
Age in years	<5	3	2.4
	14-May	19	15.1
	15-24	31	24.6
	25-34	31	24.6
	35-44	22	17.5
	>44	20	15.9
	Total	126	100
Residence	Rural	98	68.3
	Urban	28	22.2
	Total	126	100

Table 1: Socio demographic characteristics of cases.

Variable	Category	Frequency	Percent
Duration of arrival in hours	<6	14	11.1
	12-Jun	32	24.4
	24-Dec	19	15.1
	>24	61	48.4
	Total	126	100
Complications developed before arrival	Yes	44	45
	No	82	65.1
	Total	126	100
Type of Complication developed	Peritonitis	17	15.1
	Hypovolemic shock	22	19.8
	Other	5	
	Total	44	34.9
Previous surgery	Yes	48	38.1
	No	78	61.9
	Total	126	100
Indication of previous surgery	Small bowel obstruction	12	25
	Trauma	11	22.9
	Large bowel obstruction	14	29.2
	Complicated appendicitis	5	10.4
	Gastro intestinal tumor	3	6.3
	Other	3	6.3
	Total	48	100

Table 2: Condition of the patients with SBO on admission.

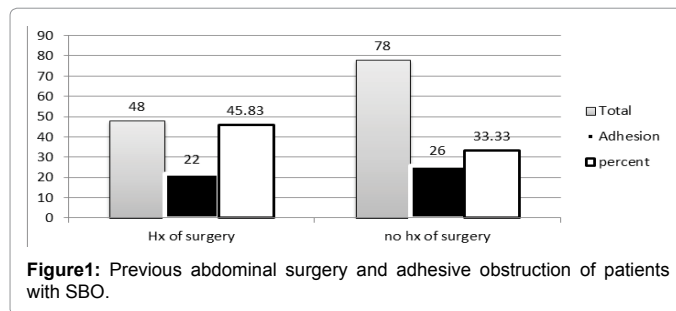


Figure1: Previous abdominal surgery and adhesive obstruction of patients with SBO.

Anastomotic leakage in 23.7% (n=9) and fascia dehiscence in 10.5% (n=4). There were 12 deaths making the mortality rate 9.5% (Table 4) (Table 5) (Table 6).

		Method of management		
		Operative	Conservative	Total
Pre-operative diagnosis	Hernia	7	0	7
	Ascariasis	4	1	5
	Adhesion	32	18	50
	Small bowel volvulus	43	5	48
	Intussusception	3	0	3
	Other	4	0	4
	TOTAL	93	24	117

Table 3: Pre-operative diagnosis versus method of management.

		Condition of the bowel		
		Viable	Gangrene	Total
Duration of illness before arrival	<6hrs	5	4	9
	6-12hrs	11	6	17
	12-24	15	4	19
	>24	29	28	57
	TOTAL	60	42	102

Table 4: Condition of the bowel versus duration of illness before arrival.

Variable	Category	Frequency	Percent
Duration of arrival in hours	<6	14	11.1
	12-Jun	32	24.4
	24-Dec	19	15.1
	>24	61	48.4
	Total	126	100
Complications developed before arrival	Yes	44	45
	No	82	65.1
	Total	126	100
Type of Complication developed	Peritonitis	17	15.1
	Hypovolemic shock	22	19.8
	Other	5	
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	Gastro intestinal tumor	3	6.3
	Other	3	6.3
	Total	48	100

Table 5. Type of obstruction, Intra-operative finding, the surgery done and outcome.

Variable	Category	Outcome				COR of 95%CI	P value
		Improved		Dead			
		Frequency	%	Frequency	%		
Duration of illness before arrival	<6hrr	14	11.1	0	0	0.000	0.999
	6-12	31	24.6	1	0.8	0.214 (0.026-1.790)	0.155
	12-24	16	12.7	3	2.4	1.242 (0.294-5.242)	0.768
	>24	53	42.1	8	6.3	1	
Post-operative complication	Yes	28	22.2	10	7.9	0.00	0.998
	No	62	49.2	2	1.6	1	
Sex	Male	81	64.3	5	4	1	
	Female	33	26.2	7	5.6	3.436 (1.018-11.604)	0.047

Residence	Rural	87		11		1	
	Urban	27		1		0.293 (0.36-2.373)	0.250
Pre-operative complication	Yes	33	26.2	11	8.7	1	
	No	81	64.3	1	0.8	27 (3.35-217.584)	0.002
Type of obstruction	Dynamic	104	82.5	9	7.1	0.288 (0.067-1.241)	0.095
	Adynamic	10	7.9	3	2.4	1	
Methods of management	Operative	90	71.4	12	9.5	1	
	Conservative	24	19.1	0	0	000	0.998

Table 6: Bivariate logistic regression analysis of management outcomes of patients.

Variable	Category	Outcome				COR of 95%CI	AOR
		Improved		Dead			
		Frequency	%	Frequency	%		
Sex	Male	81	64.3	5	4	1	
	Female	33	26.2	7	5.6	3.436 (1.018-11.604)	4.28 (1.070-17.17)
Pre-operative complication	Yes	33	26.2	11	8.7	1	
	No	81	64.3	1	0.8	27 (3.35-217.584)	0.04 (0.004-0.32)
Types of obstruction	Dynamic	104	82.5	9	7.1	0.288 (0.067-1.241)	2.10 (0.40-11.01)
	Adynamic	10	7.9	3	2.4	1	

Table 7: Multivariate regression of management outcomes of patients with SBO.

On binary logistic regression, sex of patient has significant association with patient's outcome (P=0.047, 95% CI, (COR 3.436 (1.018-11.604)).

And there is also significant association between pre-operative complication and type of obstruction (P=0.002, 95% CI, (COR 27(3.35-217.584)), (P=0.095, 95% CI, (COR 0.29 (0.07-1.24))), so they are chosen as candidate for multivariate logistic regression (Table 7).

Since more than one factor have significant association with patient outcome on the binary analysis. Therefore, a Multivariate regression was applied to determine which factors best explained and predict outcomes of patient. P-value <0.25 in Bivariate logistic regression were a candidate for multivariate regression analysis. Pre-operative complication has significant statistical association with patient outcome, those who have preoperative complication had 4% risk of dying than those who do not have a complication (P=0.002, 95% CI, AOR (0.04 (0.004-0.32))). Similarly female patients are 4.28 times at risk of dying than males (P=0.047, 95% CI, AOR (4.28 (1.070-17.17))).

Discussion

Intestinal obstruction is a common surgical problem and accounts for a large percentage of surgical admissions for acute abdominal pain globally. It develops when air and secretions are prevented from passing through gastrointestinal tract as a result of either intrinsic or extrinsic compression (i.e., mechanical obstruction) or gastrointestinal paralysis [1,2].

Intestinal obstruction is more in males than in females. Male to female ratio in this study was 2.15:1, it was almost similar in study done in tertiary care hospital in Larkana and Tikur Anbessa teaching hospital and also Kibogola Hospital, a rural hospital in Rwanda [1-3]. The prevalence of bowel obstruction in this study is 25% among patient with acute abdomen. This is also similar to the prevalence at Tikur Anbessa Teaching hospital which was 26% and the prevalence of small bowel obstruction among intestinal obstruction in this study was 53% which was almost similar to the study done at Tikur Anbessa Teaching Hospital which was 52.3% [2].

In our study, the most common cause of small bowel obstruction was adhesion which was 47% followed by volvulus 33.3% and external hernia and ascariasis each 6.9%. It was similar to the study done Tikur Anbessa Teaching hospital but it was dissimilar to most African countries where external hernia was the leading case [3-5]. The most common risk factor for adhesion was abdominal surgery and abdominal trauma [3,4,6]. In our study also adhesive obstruction was more common in patients with previous abdominal operation. It was found in 45.83% of patients with previous abdominal surgery. External hernia was the cause of obstruction in only 6.9%. This may be external hernias are repaired an elective bases before they become strangulated. As health seeking behaviours of society increases and health service delivery improves, the etiology of small bowel obstruction will be like that of developed country where adhesion was the leading case [6,7]. Small bowel volvulus was the leading cause in some part African countries including some parts of our country [8-10]. In this study it was the second not the first because some of them were managed conservatively without operation. The causes of small intestinal obstruction are varying in different parts of the world. Even the causes are different with seasons [6,11-13]. In some part Africa, ascariasis could also a cause of small bowel obstruction especially in children [10,14]. In this study there were seven cases (6.9%) due to ascariasis for which laparotomy were done.

Nineteen percent of the patients responded to conservative method of management and most of them were due to adhesion. And 81% of them required laparotomy. From 102 operated patients 37.3% of them developed post-operative complication. The most common post-operative complication was surgical site infection which accounts 57.9% among post-complication. Anastomotic leakage and fascia dehiscence were accounted 23.7% and 10.5% respectively. The overall post-operative complication rate is similar the study done in Larkana which was 31.6%. But the ratio of surgical site infection was higher in our study when compared to the study in Larkana [1].

The mortality rate here was 9.5% which was similar to the study at Gondar University Hospital, Ethiopia (9.3%) [7]. And it was lower than the study done in Nigeria [11]. Mean hospital stay was 9.39 days which ranges from minimum of 4 days to maximum of 23 days. The

median hospital stay was 8 days. The mean hospital stay is longer than study done in Gondar University Hospital [8]. This may be because the wound infection rate is higher in this hospital thus patients stay longer for wound care.

Limitations of the Study

Our data was a secondary data since the data was collected from patients chart and registration books, which was not completely documented. So, important data was not available. The sample size was small which made difficult to see the significance of some of the statistic.

Conclusion

Small Intestinal obstruction is a commonly encountered condition of the surgical emergency in our study. Adhesion was the leading cause of obstruction followed by small bowel volvulus. There are very few causes of external hernia. This means hernias are being repaired before causing obstruction. There is high rate of wound infection in this series which shows problem of infection prevention. High mortality and complication and prolonged hospital stay were observed in patients with obstruction presented 24 hours after the onset of symptoms.

Recommendation

Early diagnosis, adequate preoperative resuscitation and proper post-operative care shall be done by health professionals to reduce complication and mortality. This could be achieved by increasing public awareness on clinical features of intestinal obstruction as well as by improving the knowledge of mid and lower level health professionals on the diagnosis, resuscitation and importance of early referral to higher center. Hernias shall be repaired by skilled professionals early before obstruction/strangulation and even if possible by campaign.

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