

“Outcome of conservative approach in the management of postoperative adhesive small bowel obstruction”

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Abstract: Intestinal obstruction is a common problem encountered in surgical practice. Adhesions are most frequent cause of small bowel obstruction (SBO) in the developed world and are responsible for 60-70 percent of SBO. Adhesive SBO requires appropriate management with a proper diagnostic and therapeutic pathway. The management of postoperative adhesive small bowel obstruction is controversial because surgery can induce new adhesions prediposes recurrence, whereas conservative treatment neither removes the cause of the obstruction nor prevents the recurrence. So study in this field is very important. Current practice in many centres recommends conservative approach in the management of postoperative adhesional SBO until surgical indication arises. The principle of conservative treatment includes nasogastric decompression, intravenous hydration and clinical observation to identify surgical indication. In Rajshahi medical college hospital, the outcome of this approach is not yet studied. This is a Prospective descriptive study and was carried out in Surgery department of Rajshahi Medical College & Hospital, Rajshahi; during the period of July 2015 to December 2015 on 100 patients who presented with the features of postoperative adhesional small bowel obstruction. The objective of this study is to find out the outcome of conservative approach in the management of postoperative adhesive small bowel obstruction. Plain abdominal x-ray in erect posture and in some selected cases CT scan of abdomen was done along with clinical assesment to confirm the diagnosis. The decision of laparotomy was taken if there was any sign of bowel strangulation or clinical deterioration or if obstruction was not relieved within 72 hours of conservative treatment . All the cases received a course of conservative treatment under frequent monitoring. Completely symptomatic relieve of obstruction was observed in 72 (72%) cases and remaining patients required surgery. Among the 72 relived cases 1st attack of SBO patients was found 55 (72.36%) and recurrent cases was 17 (70.83%). In this study total 64 patients were female and 34 were male patients, among the female 50 (78.12%) cases responded completely by conservative treatment. 4 (6.25%) cases developed strangulation and 10 (15.62%) cases neither responded nor became strangulated within 72 hours of onset of symptoms. On the other hand, among the male 22 (61.11%) responded completely, 7 (19.44%) developed strangulation and remaining 7 (19.44%) was unchanged. Non operative management should be attempted in absence of signs of peritonitis or strangulation because a certain group of patients with adhesive small bowel obstruction will benefit from conservative treatment as the resolution rate is high (72%).

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I. Introduction

Small-bowel obstruction secondary to adhesions is a frequent cause of admission on surgical floors¹. Abdominal adhesions are strands of fibrinous tissue that form within 5-7 days usually as a result of surgery between surgically injured tissues². It commonly forms secondary to the normal wound healing process. As a result of fibrin formation at the site of surgically injured tissues which provides the matrix for fibroblasts to migrate and generate a collagen extracellular matrix (ECM). It is the ECM and its associated cells that ultimately converted into fibrous tissue and causes adhesions³. It takes about 3 weeks from initial surgery. This fibrous tissue may be dense or loose in the form of single band or cluster of adhesions which causes mechanical intestinal obstruction. Clinical presentation may be in the early postoperative days or delayed as late as 20 years after operation². The most common adhesion related problem is small bowel obstruction. About of 4% of laparotomy may be complicated by adhesional small bowel obstruction early or delayed². 20-40% requires repeated hospital admission and 2% of them require re-laparotomy. Not only in the developed world but also in

the developing world, the frequency of small intestinal obstruction following post operative adhesions are increasing⁴⁻⁶. It has been estimated that up to 70% of cases of small bowel obstruction in the US are due to adhesions⁷. It is characterized by the presence of abdominal pain, vomiting, abdominal distention and obstipation⁸. Patients suffering from this condition are often difficult to assess and require careful evaluation and management because it is associated with considerable morbidity and mortality⁹. Overall rate of adhesion related morbidity is at least 3-5% of all laparotomies⁹. The Surgical and Clinical Adhesions Research Study (SCAR) has recently reported preliminary findings of adhesive SBO. SCAR is a large scale epidemiological study performed with the Scottish Medical Record Linkage Database which has prospectively followed a cohort of 52,192 patients undergoing a laparotomy in Scotland in 1986. It reports a 1 in 3 risk of re-admission with a possible adhesion-related problem over the subsequent 10 years. This study suggests that the burden of adhesion-related obstruction continues to increase for at least 10 years and probably beyond after the index operation¹⁰. The management of post-operative adhesive small bowel obstruction has considerable controversies. Only few authors have emphasized the importance of early operation for any attack of bowel obstruction because of the possibility of serious sequelae with delayed treatment. However, there is no question that the problem is remised spontaneously in a significant number of patients, who therefore need not require reoperation¹¹. A recent study has demonstrated that any patient re-admitted for adhesion related problems is as likely to require non-operative treatment as opposed to surgery and those subsequent admissions are equally likely to require non-operative or operative treatment, irrespective of the previous treatment received¹². The conservative treatment include receiving intravenous hydration & electrolytes and keeping the patients nil orally is successful in 73% to 90% of cases¹³, but rest of the patients require surgical intervention to avoid serious complication like strangulation and gangrene¹⁴⁻¹⁵. A study of population-based administrative data from California found that 76% of 32,000 patients admitted with adhesive SBO resolve without surgery. Another study in 2009 by Nationwide in patient sample (NIS) in Newton, Massachusetts, found that 82% of 27,000 adhesive SBO patients recovered without surgical intervention¹⁶. This study will be conducted to know the outcome of conservative treatment in adhesive intestinal obstruction in our set up. The management of post-operative adhesive small bowel obstruction has considerable controversies. Many studies recommend that conservative approach allows resolution of obstruction in most of the cases although recurrence is common. They also suggest that surgery is not curative and surgery cannot prevent recurrence also. So value of conservative approach is a matter of research. As there is very limited study in this field so it is very necessary to perform such a study.

II. Objective

General Objective:

1. To determine the outcome of conservative approach in the management of postoperative adhesional small bowel obstruction .

Specific Objectives:

1. To find out rate of complete clinical resolution of obstruction by conservative treatment.
2. To compare the effectiveness of conservative treatment on the non recurrent SBO with recurrent SBO

III. Materials and methods

This study was carried out in the Department of Surgery, Rajshahi medical college hospital, Rajshahi during the period of July 2015 to December 2015. According to selection criteria total 100 cases are selected who are presented with mechanical small bowel obstruction with previous history of abdominal surgery. Diagnosis is confirmed by plain abdominal radiograph and/or CT scan of abdomen along with clinical assessment. Any intestinal obstruction developed less than six weeks after abdominal surgery was not included in the study population. At the time of admission a detailed history including age, sex, type of previous abdominal surgery as well as findings of clinical examination were recorded. Blood samples were taken for full blood count, blood grouping, blood sugar, serum electrolytes and serum creatinine. Plain abdominal x-ray in erect posture, showed dilated loops of small intestine and air fluid levels were taken as indicative of intestinal obstruction. CT scan of abdomen was performed only in some selected cases, in whom the cause of obstruction was suspected other than adhesions (e.g. inflammatory bowel disease, TB, malignancy etc.). According to the CT findings different causes other than adhesion were sort out. Initially all patients were managed by intravenous hydration, nasogastric tube decompression and prophylactic antibiotic. All patients were examined and monitored at a regular interval. The decision of laparotomy was taken if there was any sign of bowel strangulation or clinical deterioration or if obstruction was not relieved within 72 hours of conservative treatment.

Selection criteria of the study participants

Inclusion criteria:

1. History of previous laparotomy.

2. Clinical features of mechanical intestinal obstruction.
3. Evidence of small bowel obstruction in plain x-ray abdomen and/or CT scan.

Exclusion criteria:

1. Intestinal obstruction in early post operative period (within the first 6 weeks postoperatively).
2. Post operative adhesional SBO with features of strangulation or peritonitis.
3. Small intestinal obstruction due to other causes like hernia, IBD, malignancy etc.

IV. Result

This study was carried out in the Department of Surgery, Rajshahi medical college hospital, Rajshahi during the period of July 2015 to December 2015. According to selection criteria total 100 cases are selected who are presented with mechanical small bowel obstruction with previous history of abdominal surgery. Diagnosis is confirmed by plain abdominal radiograph and/or CT scan of abdomen along with clinical assessment. In this study 64 patients were female, among them 53 (82.81%) were presented with 1st attack of SBO and remaining 11 (17.18%) had history of one or more recurrence. On the other hand, 23 (63.88%) male patients presented with 1st attack of SBO and 13 (36.10%) had a history of one or more recurrence. All cases were treated conservatively with monitoring and response of was carefully observed. Complete relief of obstruction was found in 72 cases. Among them 50 (78.10%) were female and 22 (61.11%) were male. 11 cases develop features of strangulation and remaining 17 cases had neither responded nor strangulated. Patients of 2nd and 3rd group were selected for emergency laparotomy. Response of conservative treatment was more or less similar irrespective of number of recurrence of SBO. In this study 72.36% case of 1st attack completely responded. Similarly 70% cases of 2nd attack and 75% cases of 3rd attack responded conservatively.

Table 1: Presentation of the study population according to the frequency and recurrence of SBO (n=100)

Recurrence of SBO	Sex		Total
	Male (n=36)	Female (n=64)	
1 st attack	23 (63.88%)	53 (82.81%)	76 (76%)
2 nd attack	12 (33.33%)	08 (12.5%)	20 (20%)
3 rd attack	01 (2.77%)	03 (4.68%)	04 (4%)

Table 2: Response of Conservative treatment among the study population (n=100)

Response	Frequency		Total
	Male (n=36)	Female (n=64)	
Relieved completely	22 (61.11%)	50 (78.10%)	72 (72.0%)
Developed features of strangulation	07 (19.44%)	04 (06.25%)	11 (11.0%)
Neither responded nor strangulated	07 (19.44%)	10 (15.62%)	17 (17.0%)

Table 3: Comparative response of the conservative treatment upon the non recurrent and recurrent cases (n=100)

Number of attacks	Frequency	Percentage
Non recurrent SBO/ 1st attack (n=76)	55	72.36%
Recurrent SBO/ 2nd attack (n=20)	14	70.00%
Recurrent SBO/ 3rd attack (n=04)	03	75.00%

V. Discussion

This study was carried out in the department of surgery, Rajshahi medical college hospital on 100 cases during the period of July 2015 to December 2015 for 6 months. Both male and female patients of all ages those who are admitted in different units of RMCH and diagnosed as post operative adhesional small bowel obstruction (SBO) were included in this study. Concomitant other causes (e.g. intra-abdominal mass) of small bowel obstruction on the basis of clinical suspicions were excluded by CT scan abdomen. During the study it was observed that some patients presented too late with complications (e.g. Features of strangulation or peritonitis) or elapsing more than 3 days. These patients were not included in this study because there was no time in hand to treat these patients conservatively. In this study is among 100 cases 36 male and 64 female. Most of them were rural (63) and from lower and middle socioeconomic group (89). There was history of various types of index surgery considered in this study (e.g. Gynecological or Obstetrical operations, laparotomy for peritonitis etc.). 33 patients had history of either Gynecological or Obstetrical operations, 23 underwent laparotomy for peritonitis, 16 presented with history of operation for intestinal obstruction, 19 had of lower abdominal or colorectal surgery and 9 had been operated for trauma abdomen. It was observed that postoperative SBO was relatively common (>50%) in lower abdominal surgeries including gynaecological, obstetrical and other operations. Muhammad Hussain et al, conducted a study on 73 cases and found laparotomy for peritonitis and gynecological surgery was the common index operation¹⁷. Whereas Kossi J et al reported

colorectal and upper abdominal surgery to be the most prevalent previous operation¹⁸. In this study among the 100 cases 76 were presented with SBO after an index surgery which was described as 1st attack. 20 patients presented with 2nd attack because they had history of either conservative treatment or operation for 1st attack. Only 4 patients were found to have 3rd attack. All 100 cases initially received a course of conservative treatment under frequent monitoring. Complete relieve of obstruction was observed in 72 (72%) cases and remaining required surgery. In those relived cases 1st attack of SBO patients was found 77.63% and recurrent cases was 62.5%. Akgur FM et al in 1991 conducted a study upon 230 cases; the records of these adhesive small bowel obstruction (ASBO) episodes in 181 patients have been reviewed to observe the place of conservative treatment and to establish criteria to predict the success of conservative trial. Immediate operation has been reserved for 81 episodes that have presented with fever and leucocytosis and/or localized abdominal tenderness, or complete obstruction. The remaining 149 episodes have initially undergone conservative trial. Although 110 episodes (73.8%) have been cured with conservative trial, 39 (26.2%) subsequently necessitated surgical intervention. No adverse occurrences have been observed during or after delayed operations. There was neither strangulated bowel nor mortality both in delayed operation and conservatively treated groups. Recurrence has occurred with rate of 18.75% and 36.47% after surgery and conservative treatment, respectively¹⁹.

In this study 64 patients were female, among them 53 (82.81%) were presented with 1st attack of SBO and remaining 11 (17.18%) had history of one or more recurrence. On the other hand, 23 (63.88%) male patients presented with 1st attack of SBO and 13 (36.10%) had history of one or more recurrence. Response of conservative treatment was carefully observed. Complete relief of obstruction was found in 72 cases. 11 cases develop features of strangulation and remaining 17 cases had neither responded nor strangulated. Non responded cases were selected for emergency laparotomy. In a study by Muhammad Hussain et al conservative treatment was successful in 71.24% and operative intervention was needed in 28.76%¹⁷. In one series by Cox et al 75.5% patients responded to conservative treatment while 14.5% had features suggestive of strangulation and underwent immediate laparotomy²⁰. Serror D et al claimed that conservative approach resulted in a 73% resolution of obstruction with no significant increase in mortality or in the rate of strangulated bowel²¹. It was observed that during conservative treatment all patients are not equally responded. Some patient got relieve of obstruction very rapidly even few hours of conservative treatment. Many patients responded slowly to get relieve of obstruction. In this study, complete relieve of SBO was observed in 19 (25%) cases within 24 hours of conservative treatment. 36 (47.36%) cases required about 48 hours to regain bowel function and 17 (22.36%) cases were treated for about 72 hours for complete obstruction relief. In a study by Muhammad Hussain et al reported that among 73 cases whose obstruction was relieved with conservative treatment 42 patients responded in 48 hours, 8 patients in 72 hours while in 2 patients obstruction was relieved on the 4th day of admission. Surgical intervention was needed in 21 patients¹⁷.

A differential response to conservative treatment between male and female patients was observed in this study. Total number of female patient was 64, among them 50 (78.12%) cases responded completely by conservative treatment. 4 (6.25%) cases developed strangulation and 10 (15.62%) cases neither responded nor became strangulated. On the other hand among 36 male patients, 22 (61.11%) responded completely, 7 (19.44%) developed strangulation and remaining 7 (19.44%) was unchanged. In this study it was observed that response of conservative treatment in female patient was relatively better. Response of conservative treatment was more or less similar irrespective of number of recurrence of SBO. In this study 77.63% case of 1st attack completely responded. Similarly 70% cases of 2nd attack and 75% cases of 3rd attack responded conservatively.

When to decide surgery is a critical event. A lot of controversy is there between the surgeons regarding the timing of operation. However, most of the surgeons agree that any features of strangulation, peritonitis, localized tenderness with tachycardia and leucocytosis confer a decision for surgery. So during the conservative treatment proper monitoring is mandatory. In this study all the patients were carefully and frequently monitored to observed development of strangulation. 11 patients were found to have features of strangulation, among them 2 developed strangulation within 24 hours of conservative treatment, 8 within 48 hours and remaining 1 thereafter. In this study it was observed that most of the strangulations (72.72%) occurred within 48 hours of conservative treatment. A study by Joseph C. Carmichael et al, in 2006 over 500 patients and reported that approximately 6 to 13% of patients with SBO present with bowel strangulation. They also commented about the timing for an operation for SBO, the surgeon must first define which patients are candidates for non-operative management and which need emergent surgical intervention. Most surgeons would agree that any patient with fever, tachycardia, or peritonitis is likely to have strangulation or perforation and should have an immediate operation. That being said, strangulation of the bowel can occur without specific signs or symptoms. The physician must remember that no test has been shown to be a true indicator or predictor of strangulation. No single sign, symptom, laboratory value, or any combination of them can reliably predict strangulation²².

VI. Limitations of the study

As this study has been carried out over a limited period of time and relatively small number of patients,

it could not have been large enough to be of reasonable precision. This study did not take into consider some other measures in conservative management like long tube decompression, gastrografin dye etc.

VII. Conclusion

Non operative management should be attempted in absence of signs of peritonitis or strangulation because most patients with adhesive small bowel obstruction will benefit from conservative treatment as the resolution rate is high (72%). “Don’t let the sun set on a bowel obstruction.” This adage has guided surgeons since the advent of operative therapy for this condition. The importance of early surgical treatment for the patients having strangulated bowel remain unchanged. However, that the risk of developing strangulation is relatively low with adhesive small bowel obstruction and in fact identified and operated early. The results of this study are encouraging and conform to local and international literature. However this can reduce the morbidity in patients and minimizing the load to our limited skilled manpower and also financial burden on patients and society.

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