

Surgical Intervention in Adhesive Intestinal Obstruction

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ABSTRACT

Background: Adhesive small bowel obstruction (ASBO) is a common cause for admission to surgical wards in developed countries, particularly following colorectal and pelvic surgery. Despite advances in diagnosis and treatment, the operative intervention rate is between 15 and 30%, the recurrence rate is up to 30% following surgery and the mortality is between 2 and 8%.

Objective: The aim of current study was to report the time of surgical intervention of patient with adhesive intestinal obstruction.

Patients and Methods: This study included a total of 50 patients with clinical diagnosis of adhesive SBO, attending at Surgical Department, Aswan University Hospital. This study was conducted between January 2018 to December 2018. After clinical and radiological diagnosis of adhesive SBO, all patients were promptly hydrated with Ringer lactate solution and their electrolytes and acid base imbalances were corrected.

Results: Successful conservative treatment was noted in 28 patients (66%) with discontinuation of nasogastric decompression within an average period of 2 days followed by discharge on fourth day of admission. 22 Patients (44%) underwent surgery, safe conservative management needed the pre-requisite of having ruled out any possibility of strangulation of the bowel as the first step of management. As for hospital stay patients who underwent conservative therapy have less durations of hospital stay (3-6 days) than those who underwent surgical intervention (7-14 days).

Conclusion: ASBO remains a common clinical problem. Patients presenting with symptoms and signs consistent with ASBO should undergo plain abdominal X-ray. If this confirms the diagnosis, and there is no clinical suspicion of strangulation, a water soluble contrast agent should be administered by Nasogastric tube.

Keywords: Surgical, Adhesive Intestinal Obstruction, Management.

INTRODUCTION

Acute intestinal obstruction occurs when there is an interruption in the forward flow of intestinal contents. This interruption can occur at any point along the length of the gastrointestinal tract, and clinical symptoms often vary based on the level of obstruction. Intestinal obstruction is most commonly caused by intra-abdominal adhesions, malignancy, or intestinal herniation. The clinical presentation generally includes nausea and emesis, colicky abdominal pain, and a failure to pass flatus or bowel movements. The classic physical examination findings of abdominal distension, tympany to percussion, and high-pitched bowel sounds suggest the diagnosis⁽¹⁾.

Many regions and countries have denoted different tendency towards etiologic spectrum of intestinal obstruction, in the past few years adhesive intestinal obstruction and malignant bowel obstruction have replaced hernia. Intestinal obstruction accounts for approximately 15 percent of all emergency department visits for acute abdominal pain. Complications of intestinal obstruction include bowel ischemia and perforation. Morbidity and mortality associated with intestinal obstruction have declined since the advent of more sophisticated diagnostic tests, but the condition remains a challenging surgical diagnosis. Physicians who are treating patients with intestinal obstruction must weigh the risks of surgery with the conservative way⁽²⁾. Postoperative adhesion is defined as biochemical and cellular response that happens to repair the peritoneum

after operative trauma, resulting in intestinal contents to not pass smoothly⁽³⁾.

Pelvic adhesions that follow trans-abdominal gynecological surgery have long been implicated in causing pain and infertility. Similarly, patients presenting to the general surgeon display a spectrum of adhesion related problems or morbidity. The treating surgeon often faces difficulties with access and obscured normal anatomy which may lead either to an inability to apply minimal access surgery, prolongation of operative time or result in potentially serious organ injury such as inadvertent enterotomy). Adhesions are estimated to account for about a third of all bowel obstructions and two-thirds of small bowel obstructions in the western world⁽⁴⁾.

Managing adhesions and adhesion related complications is expensive in terms of time, effort and finance and impacts not only on the patient and the treating physician but also the health care system at large. The prolongation in hospital stay, re-admissions, repeated surgical interventions and litigation impose an enormous burden on the health care systems globally, making adhesion prevention an important area of health care intervention research^(5, 6). As once established, adhesions follow an unpredictable temporal course, which is attended by a lifetime risk of recurrent symptoms, complications, re-admissions and repeat surgery, prevention seems to be the most viable strategy yet. Peritoneal injury, the attendant inflammation,

imbalance in plasmin system and proximity of injured surfaces are the crucial elements in adhesion formation. Hence, preventive strategies have been designed targeting these steps individually or in combination. Injury limitation, a vital aspect of prophylaxis is achieved by meticulous attention to operative technique and tissue handling (7).

Adhesive small bowel obstruction requires appropriate management with a proper diagnostic and therapeutic pathway. Indication and length of non-Operative treatment and appropriate timing for surgery may represent an insidious issue. Delay in surgical treatment may cause a substantial increase of morbidity and mortality (6).

However repeated laparotomy and adhesiolysis may worsen the process of adhesion formation and their severity. Furthermore, the introduction and widespread of laparoscopy has raised the question of selection of appropriate patients with adhesive small bowel obstruction good candidate for laparoscopic approach. On the other hand, several adjuncts for improving the success rate of non-operative treatment and clarifying indications and timing for surgery are currently available, such as hyperosmolar water-soluble contrast medium (8).

The aim of current study was to report the time of surgical intervention of patient with adhesive intestinal obstruction.

PATIENT AND METHODS

This study included a total of 50 patients with clinical diagnosis of adhesive BO, attending at Surgical Department, Aswan University Hospital. This study was conducted between January 2018 to December 2018.

Ethical approval and written informed consent:

An approval of the study was obtained from Aswan University Academic and Ethical Committee. Every patient signed an informed written consent for acceptance of the operation.

After clinical and radiological diagnosis of adhesive SBO, all patients were promptly hydrated with Ringer lactate solution and their electrolytes and acid base imbalances were corrected. All patients were put on conservative treatment with close monitoring of vital and abdominal signs and abdominal radiographs. Half liter of ringer solution mixed with gastrografin dye was administered through a nasogastric tube and transit of the contrast was examined by serial abdominal radiographs at 4, 8, 12 and 24 hours.

Patients in whom contrast appeared in large bowel within 24 hours were regarded as having partial obstruction and conservative treatment was continued for such patients. In the rest of patients, the contrast failed to reach the large bowel within 24 hours. These patients were regarded as having complete obstruction, and were proceeded for laparotomy at different time,

much cases after 48h. The criteria taken for therapeutic role of gastrografin was passage of flatus/stool, within 24 hours of administration of contrast.

The included subjects were divided into two groups; **Group A** consisted of 28 patients who had received a conservative treatment and not needed surgical intervention. Group A was further divided into subgroup A1 included 10 cases resolved within 24hours from admission and subgroup A2 included 18 cases resolved after 48 hours.

Group B consisted of 22 patients in whom conservative treatment failed and needed surgical intervention. Group B was further divided into subgroup B1 included 10 cases who needed surgical intervention within 48 hours and subgroup B2 included 12 cases who needed surgical intervention After 48 hours.

Initial clinical assessment of patients was done. Clinic data were recorded as age, sex, full clinical examination. Several investigations were done including CBC, urea, creatinine, Na⁺/K⁺, Liver function tests. Radiological investigations were done as Abdominal X-ray, Abdominal ultrasound, MSCT Abdomen, Gastrografin follow-through.

Follow up recurrence in 6 months after discharge.

Statistical analysis

Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The following tests were done:

- Independent-samples t-test of significance was used when comparing between two means.
- Chi-square (χ^2) test of significance was used in order to compare proportions between two qualitative parameters.
- The confidence interval was set to 95% and the margin of error accepted was set to 5%. The p-value was considered significant as the following:
 - Probability (P-value)
 - P-value <0.05 was considered significant.
 - P-value <0.001 was considered as highly significant.
 - P-value >0.05 was considered insignificant.

RESULTS

Demographic data:

Age of the study participants ranged from 25 – 77 years with mean of 49.4 years and the majority of patients 32 (66%) were between 30 – 60 years. Also, most of the study participants were females (60%) with male to female ratio 1:1.5

Table (1): Demographic data of study subjects.

Item	Distribution no (%)
Age (years)	
Mean±SD	49.4±13.1
Range	25 – 77
<30 yrs	4(8%)
30-60 yrs	33(66%)
>60 yrs	13(26%)
Gender	
Male	20(40%)
Female	30(60%)

History and type of previous abdominal surgery:

All of our study subjects had previous abdominal surgery 50 patients (100%), distributed as follow appendectomy 16 patients (32%), followed by Cesarean section 12 patients (24%), then cholecystectomy 11 patients (22%), then exploration 9 patients (18%) and lastly splenectomy 2 patients (4%).

Table (2): Types of previous abdominal surgery to study subjects.

Item	Distribution no(%)
Appendectomy	16 (32%)
Cesarean section	12 (24%)
Cholecystectomy	11(22%)
Exploration	9 (18%)
Splenectomy	2 (4%)

Management of study participants: Patients allocated to 2 groups;

Group (A): included 28 patients (56%) who showed improvement of symptoms clinically and radiologically after conservative treatment and **Group (B):** included 22 patients (44%) who did not improved after 24 hours of conservative treatment and needed surgical intervention.

Table (3): Classification of study participants according to management.

Item	Distribution no (%)
Group A 28 (56%)	
Subgroup A1	18 (36%)
Subgroup A2	10 (20%)
Group B 22 (44%)	
Subgroup B1	10 (20%)
Subgroup B2	12 (24%)

Surgical intervention in group B:

This group was divided into:

Subgroup B1: patients who needed surgical intervention within 48 hrs 10 (45%).

Subgroup B2 : patients who needed surgical intervention after 48hrs. 12 (55%)

Table (4): Type of surgery performed on patients of group B.

Item	Subgroup B1	Subgroup B2
Adhesiolysis	7(45%)	9 (55%)
Intestinal anastomosis	1(8.3%)	2(15.4%)
Rt hemicholecctomy	1(8.3%)	0(0%)
Colonic anastomosis	1(8.3%)	1(7.7%)

Comparison between the two study groups according to duration of hospital stay (days), recurrence and mortality:

Mean duration of hospital stay was 4.2 days in group A and 10.2 days in group B, and so it was statistically significant longer in group B than group A (P=0.000). As regard to recurrence, after follow-up for 6 months it occurred in 4 patients (14%) in group A and 2 patients (9%) in group B with no statistically significant difference between the two study groups.

Table (5): Comparison between the two study groups according to duration of hospital stay (days), recurrence.

Item		Group A	Group B	P-value
Duration of hospital stay	Mean±SD	4.2±0.8	10.2±1.5	0.000*
	Range	3 – 6	7 – 14	
Recurrence	No (%)	4(16%)	2(8%)	0.667

DISCUSSION

In the current study Adhesive small bowel obstruction (ASBO) is a common cause for admission to surgical department, particularly following appendectomy 32% and laparotomy 18%.

Adhesive Intestinal obstruction is an inevitable complication of abdominal surgery with significant morbidity associated with poor quality of life and predispose to repeated hospitalization. Most of them (73% – 90%) can be managed conservatively. Despite advances in surgery, 15 to 30% require surgical intervention primarily or due to failure of conservative management. Because of the nature of the disease recurrence has been estimated to be 30%⁽⁹⁾. Among surgeries, lower pelvic surgeries are most closely related with postoperative adhesive bowel obstruction. Surgeries for appendicitis, colorectal pathologies, and gynecologic conditions are noteworthy. Lower abdominal and pelvic surgeries lead to obstruction more often than upper GI surgeries. Although postoperative adhesion is found to be the leading cause of bowel obstruction, numerous other etiologies must not be under emphasized. In case of strangulation, timely emergency surgery is required in order to minimize

bowel gangrene and subsequent resection of non-viable bowel⁽¹⁰⁾.

In a study over 2000 cases of ASBO, 1284 (64%) were successfully treated with a laparoscopic approach, 6.7% were lap-assisted, and 0.3% were converted to open repair; the overall conversion rate to midline laparotomy was 29%. Dense adhesions, bowel resection, unidentified pathology and iatrogenic injury accounted for the majority of conversions. When the etiology was attributed to a single-band adhesion, the success rate was 73.4%⁽¹¹⁾. **In our study**, successful conservative treatment was noted in 28 patients (66%) with discontinuation of naso-gastric decompression within an average period of 2 days followed by discharge on fourth day of admission. 22 patients 44% underwent surgery, safe conservative management needs the prerequisite of having ruled out any possibility of strangulation of the bowel as the first step of management. This in turn must be followed by frequent vigilant assessment for any progressing symptoms. In the surgery department at our center, the management of partial bowel obstruction is based on traditional conservative treatment. Cornerstones are volume resuscitation, bowel decompression with close monitoring for disease progress. This form of management has success rate reported in 75% -90% cases. Use of adjuvant to conservative treatment has surfaced with the argument to hasten the recovery with decrease in hospital stay and cost.

As for hospital stay patients who underwent conservative therapy have less durations of hospital stay (3-6) days than those who underwent surgical intervention (7-14) days.

As for recurrence, conservative therapy patients have shown re-admission for adhesive bowel obstruction were 4(16%) patients which is double number of patients treated surgically 2(8%) patients.

CONCLUSION

ABO remains a common clinical problem. Patients presenting with symptoms and signs consistent with ASBO should undergo plain abdominal X-ray. If this confirms the diagnosis, and there is no clinical suspicion of strangulation, a water soluble contrast agent should be administered by Nasogastric tube.

The patient should be rehydrated and a plain X-ray repeated at a time convenient to the clinical team within 24 h of admission. If this shows that the contrast has reached the caecum then, if there is no remaining clinical concern, the patient should be fed and discharged as soon as clinical resolution has occurred. If the contrast has not reached the cecum it is highly likely that the patient will not settle with continued conservative management and consideration should be given to surgery. If diagnostic doubt remains after clinical assessment and plain X-ray a CT scan may be helpful.

Non operative management:

Should be attempted in absence of signs of peritonitis or strangulation. WSCM is safe and has a definite role in diagnosis (for predicting the resolution or need for surgery) and therapy (for reducing the operative rate and shortening time to resolution of symptoms and hospital stay). Open surgery for several surgeons still remains the safest and most effective operative approach, although laparoscopic approach appears to be safe and feasible in the hands of experienced laparoscopic surgeons and in selected patients, because there are less overall complications, prolonged ileus rates and pulmonary complication associated with its use. Prevention with hyaluronic acid-carboxycellulose membrane or icodextrin, has actually gained a capital relevance. Adhesions quantification and scoring is a promising development tool for further research towards diagnosis and management of ASBO and peritoneal adhesions prevention.

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