

Adhesive small bowel obstruction: How long can patients tolerate conservative treatment?

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Received: 2002-08-17 **Accepted:** 2002-08-19

Abstract

AIM: To evaluate how long patients with small bowel obstruction caused by postoperative adhesions can tolerate conservative treatment.

METHODS: The records of patients with small bowel obstruction due to postoperative adhesions were retrospectively reviewed. Data collected included the number of admissions, type of management for each admission, duration of conservative treatment, number of repeat laparotomies, and operative findings.

RESULTS: One hundred fifty-five patients with this condition from January 1999 to December 2001, for a total of 293 admissions were enrolled in this study. Medical treatment alone was given in 220 admissions, and repeat laparotomy was performed in 73 admissions. The period of observation in patients managed medically ranged from 2 to 12 days (average: 6.9 days), while for those who underwent surgery, the range was 1 to 14 days (average 5.4 days). At surgery, adhesions were the only finding in 46 cases, while there were intestinal complications in 27, or 9.2 % of all 293 admissions. Fever and leukocytosis greater than 15 000/mm³ were prediction of intestinal complications.

CONCLUSION: With closely monitoring, most patients with small bowel obstruction due to postoperative adhesions could tolerate supportive treatment and recover well averagely within 1 week, although some patients require more than 10 days of observation.

Shih SC, Jeng KS, Lin SC, Kao CR, Chou SY, Wang HY, Chang WH, Chu CH, Wang TE. Adhesive small bowel obstruction: How long can patients tolerate conservative treatment? *World J Gastroenterol* 2003; 9(3): 603-605
<http://www.wjgnet.com/1007-9327/9/603.htm>

INTRODUCTION

Postoperative adhesions are a frequently encountered problem.

They are the most common cause of small bowel obstruction in adults^[1-3]. Clinically, the obstruction may progress to life-threatening complications or follow a more benign course. There is debate about the optimal treatment: surgical or medical management. Some authors have emphasized the importance of early operation for any attack of bowel obstruction because of the possibility of serious sequelae with delayed treatment^[4-6]. However, there is no question that the problem is remitted spontaneously in a significant number of patients, who therefore need not require reoperation^[7-9]. We undertook this retrospective study to evaluate how long patients may safely be treated conservatively, as well as what factors might suggest the need for surgical intervention.

MATERIALS AND METHODS

General data

Cases of small bowel obstruction caused by postoperative adhesions were got from the computerized medical records from January 1999 to December 2001 at Mackay Memorial Hospital, Taipei, Taiwan. The diagnostic criterias for adhesive small bowel obstruction included: (1) history of previous laparotomy (defined as initial laparotomy); (2) clinical features of mechanical ileus, such as vomiting, abdominal pain, abdominal distention and obstipation; (3) obvious evidence of small bowel obstruction on plain x-ray of the abdomen; and (4) exclusion of other organic lesions by radiological contrast study. In patients with a past history of cancer leading to the initial laparotomy or recurrence was ruled out by meticulous examinations (tumor markers, ultrasonography and radiology including CT scan, depending on types of malignancy). Other clinical findings recorded included the presence or absence of fever, tachycardia, rebound tenderness (peritoneal signs), leukocytosis, and elevation of serum amylase and alkaline phosphatase, as well as assessment of the progress and severity of the small bowel obstruction. The diseases or organs accounting for the initial laparotomy in each patient were recorded. The entire medical record for each patient was examined to see how many hospitalizations they had had in the past for adhesion-related small bowel obstruction. The interval between the initial laparotomy and any subsequent admissions were also noted. The management given, medical (conservative) or surgical (re-laparotomy), was recorded, as well as length of stay for each admission and the duration of observation before the final outcome (either resolution with conservative treatment or surgery). Medical management might include any or all of the following: no oral intake; decompression by nasogastric intubation; intravenous fluids, with electrolytes and nutrition as needed; administration of parenteral antibiotics when leukocytosis was present; and regular abdominal x-rays (usually daily). For patients treated surgically, the location of adhesions and the presence or absence of local or systemic complications were identified. Simple obstruction was defined as the presence of adhesions alone, while complicated obstruction included the presence of gangrene and/or strangulation.

RESULTS

During the study period, 155 patients were admitted with the diagnosis of adhesion-related small bowel obstruction. The male to female ratio was 75 to 80, and the age ranged from 18 to 80 years old. The organs involved in the initial laparotomies were the female genital organs in 36 cases (including incidental appendectomy in 5 cases); appendix in 27 cases; colon and rectum in 25 cases (including appendectomy in 3); stomach and duodenum in 19 cases; small bowel in 14 cases; gallbladder, biliary tract and pancreas in 13 cases; and others (including soft tissue trauma, kidney, and spleen) in 21 (Table 1).

Table 1 Initial laparotomy

Organs/types	Number of cases
OB-GYN	36 (5 ^a)
Appendix	27
Colon/Rectum	25 (3 ^a)
Stomach/Duodenum	19
Small intestine	14
Gallbladder/bile duct/pancreas	13
Others (spleen, trauma, etc)	21
Total	155

^awith incidental appendectomy.

The 155 patients had had a total of 293 admissions, with 1 patient being admitted 11 times. The interval between initial laparotomy and subsequent admissions varied widely. The shortest was 2 weeks, while the longest approached 30 years. Of the 293 admissions, medical management alone was used during 220 (75.1 %) admissions. The duration of observation until resolution of bowel obstruction ranged from 2 to 12 days (average 6.9 days, Table 2).

Table 2 Duration of observation in adhesive small bowel obstruction

Duration of observation (days)	Medical treatment: (n=220)	Simple obstruction (n=46)	Complicated obstruction (n=27)
	Admissions	Admissions	Admissions
1	0	2	4
2	15	3	5
3	18	5	3
4	20	6	5
5	26	4	3
6	25	8	2
7	30	6	1
8	19	2	2
9	18	3	1
10	15	2	1
11	19	1	0
12	15	2	0
13	0	1	0
14	0	1	0

Average duration: medical 6.9 days; all re-laparotomy 5.4 days, simple 6.1 days, complicated 4.1 days.

There were 73 admissions in which repeat laparotomy were performed to treat the obstruction (including twice in 2 patients and 3 times in 1 patient). The duration of observation prior to surgery ranged from several hours to 14 days (average 5.4 days, Table 2). At surgery, there was simple obstruction in 46

cases, and there was complicated obstruction in the other 27 (9.2 % of all admissions). The average preoperative observation period was shorter in complicated obstruction than that in simple obstruction (4.1 vs 6.1 days). The comparison of preoperative characteristics in simple and complicated obstruction was shown in Table 3. The site of initial laparotomy did not seem to influence the presence or absence of complications (for easy comparison, the types of initial laparotomies were simply divided into upper and lower abdomen, Table 3). In patients with complicated obstruction, fever was present in 18 (67 %) cases and leukocytosis (greater than 15 000/cu mm) in 20 (74 %) cases. None of the patients with simple obstruction had these findings. No patients in our series died.

Table 3 Comparison of simple and complicated obstruction

	Simple (n=46)	Complicated (n= 27)
Initial laparotomy site		
Upper abdomen	17 (37%)	9 (33%)
Lower abdomen	29 (63%)	18 (67%)
Preoperative clinical findings		
Rebound tenderness	29 (63%)	25 (93%)
Fever >38 °C	0 (0%)	18 (67%)
Tachycardia	15 (33%)	20 (74%)
Leukocytosis>15 000/cumm	0 (0%)	20 (74%)
↑ Hematocrit/ ↑ BUN	20 (43%)	24 (89%)
↑ Serum amylase	2 (4.3%)	10 (37%)
↑ Alkaline phosphatase	3 (6.5%)	7(26%)
Metabolic acidosis	0 (0%)	4 (15%)

DISCUSSION

Formation of adhesions after transperitoneal operation may be both beneficial and deleterious^[10-13]. On one hand, adhesions may localize suture line leakage or isolate an inflammatory process, thus preventing more widespread disease. On the other hand, they may contribute to morbidity, with obstruction being the major serious complication. Small bowel obstruction due to postoperative adhesions develops in 6 % to 11 % of all patients undergoing laparotomy^[9]. It may occur at any time after the initial laparotomy and result in frequent re-admissions in subsequent years^[14, 15]. In our study, adhesive small bowel obstruction followed initial laparotomy in as few as 2 weeks to as long as nearly 30 years. While it may follow any type of laparotomy, it occurs most commonly after manipulation of the lower abdomen and pelvic cavity (appendix, gynecological organs and rectum, Table 1)^[16-18].

There is continuing debating about the ideal approach to patients with adhesive small bowel obstruction^[6, 9]. The process leading to obstruction is dynamic one with twisting and untwisting of bowel segments trapped by adhesions^[12, 13]. There are as yet no totally reliable clinical predictors to differentiate episodes that will resolve spontaneously from those that will require surgery. Even with the imminent onset of bowel strangulation, signs indicating this serious condition, such as fever, leukocytosis and peritoneal signs, are not always present^[14, 19]. This makes determining how long to try conservative management prior to opting for repeat surgery difficult.

In the literature, the incidence of spontaneous recovery with conservative management ranges from 20 % to 60 %^[7, 8, 14]. Some authors recommend only a limited observation period of 24 to 48 hours^[4, 5], but others suggest a longer period is safe, although the recommended upper limit is 5 days^[20, 21]. However, in our experience, an average of 6.9 days was required for spontaneous resolution. The longest period, in 15 cases, was

12 days (Table 2). In all these cases, the patients recovered without any sequelae. This suggested that laparotomy could safely be delayed longer than recommended in the literature. Had we operated in all cases after 5 days, 141 of the 220 patients who eventually had spontaneous remission would have required surgery?

Why conservative treatment may be extended in some patients but not in others probably depends on individual variables. In reports recommending earlier surgical intervention, most of the patients who finally developed bowel complications in fact already had signs of more serious obstruction on initial presentation^[4-6]. In our series, the surgically treated patients had a shorter observation time on average, 5.4 days vs 6.9 days for those who resolved spontaneously (Table 2). This suggested that these patients had relatively early onset of signs suggestive of complications. In reported series in which conservative treatment is recommended, most patients who finally recovered spontaneously had no apparent toxic signs throughout the hospital course^[14, 20, 21]. In our experience with reoperation, in only 27 of 73 procedures were actual intestinal complications. It's conceivable that some among the other 46 might have recovered spontaneously had we observed them longer. In fact, none of these 46 episodes were characterized by fever or leukocytosis. The patients chose to undergo surgical intervention mainly because they became inpatient with medical treatment.

Although episodes of small bowel obstruction can be managed conservatively, the adhesions remain. So the possibility of recurrence still exists^[12, 15]. Unfortunately, reoperating to excise the adhesions (adhesiolysis) is not clearly beneficial, since the repeat surgical procedure itself may cause more adhesions^[22]. In addition, the average cost of an admission with surgery is much higher than that of an admission with only medical treatment^[23, 24]. Surgery is thus not a panacea for this condition, and the decision to perform it should only be made after all factors are carefully considered. Certainly, the presence of peritoneal signs, fever, and leukocytosis suggest the need for early surgery. In the absence of these signs, watchful waiting is reasonable.

In conclusion, the actual incidence of serious complications in patients with small bowel obstruction due to postoperative adhesions is low. Most patients can be managed medically. With closely monitoring and in the absence of signs suggestive of complications, an observation period even longer than 10 days before proceeding to surgical intervention appears to be safe.

REFERENCES

- Füzün M**, Kaymak MFE, Harmancıođlu Ö, Astarıcıođlu K. Principal causes of mechanical bowel obstruction in surgically treated adults in Western Turkey. *Br J Surg* 1991; **78**: 202-203
- Lee SH**, Ong ETL. Changing pattern of intestinal obstruction in Malaysia: a review of 100 consecutive cases. *Br J Surg* 1991; **78**: 181-182
- McEntee G**, Pender GMD, Mulvin D, McCullough M, Naeeder S, Farah S, Badurdeen MS, Ferraro V, Cham C, Gillham N, Matthews P. Current spectrum of intestinal obstruction. *Br J Surg* 1987; **74**: 976-980
- Otamiri T**, Sjødahl R, Ihse I. Intestinal obstruction with strangulation of the small bowel. *Acta Chir Scand* 1987; **153**: 307-310
- Sosa J**, Gardner B. Management of patients diagnosed as acute intestinal obstruction secondary to adhesions. *Am Surg* 1993; **59**: 125-128
- Mucha PJ**. Small bowel obstruction. *Surg Clin North Am* 1987; **67**: 597-620
- Wolfson PJ**, Bauer JJ, Gelernt IM, KreeI I, Aufses AH Jr. Use of the long tube in the management of patients with small-intestinal obstruction due to adhesions. *Arch Surg* 1985; **120**: 1001-1006
- Brolin RE**, Krasna MJ, Mast BA. Use of tubes and radiographs in the management of small bowel obstruction. *Ann Surg* 1987; **206**: 126-133
- Bass KN**, Jones B, Bulkley GB. Current management of small-bowel obstruction. *Adv Surg* 1997; **31**: 1-34
- Scott-Coombes DM**, Whawell SA, Thompson JN. The operative peritoneal fibrinolytic response to abdominal operation. *Eur J Surg* 1995; **161**: 395-399
- Holmdahl L**, Eriksson E, Eriksson BI, Risberg B. Depression of peritoneal fibrinolysis during operation is a local response to trauma. *Surgery* 1998; **123**: 539-544
- Holmdahl L**, Risberg B. Adhesions: prevention and complications in general surgery. *Eur J Surg* 1997; **163**: 169-174
- Dijkstra FR**, Nieuwenhuijzen M, Reijnen MMPJ, Goor van H. Recent clinical developments in pathophysiology, epidemiology, diagnosis and treatment of intra-abdominal adhesions. *Scand J Gastroenterol* 2000; **232**(Suppl): 52-59
- Tanphiphat C**, Chittmitrapap S, Prasopsunti K. Adhesive small bowel obstruction: a review of 321 cases in a Thai hospital. *Am J Surg* 1987; **145**: 283-287
- Ellis H**, Moran BI, Thompson JN, Parker MC, Wilson MS, Menzies D, McGuire A, Lower AM, Hawthorn RJS, O'Brien F, Buchan S, Crowe AM. Adhesion-related hospital readmissions after abdominal and pelvic surgery: a retrospective cohort study. *Lancet* 1999; **353**: 1476-1480
- Monk BJ**, Berman ML, Montz FJ. Adhesions after extensive gynecologic surgery: clinical significance, etiology and prevention. *Am J Obstet Gynecol* 1994; **170**: 1396-1403
- Al-Took S**, Platt R, Tulandi T. Adhesion-related small-bowel obstruction after gynecologic operations. *Am J Obstet Gynecol* 1999; **180**: 313-315
- Nieuwenhuijzen M**, Reijnen MMPJ, Kuijpers JHC, Goor van H. Small bowel obstruction after total or subtotal colectomy: a 10-year retrospective review. *Br J Surg* 1998; **85**: 1242-1245
- Sarr MG**, Bulkley GB, Zuidema GD. Preoperative recognition of intestinal strangulation obstruction: Prospective evaluation of diagnostic capability. *Am J Surg* 1983; **145**: 176-181
- Hall RI**. Adhesive obstruction of the small intestine: a retrospective review. *Br J Clin Pract* 1984; **38**: 89-92
- Seror D**, Feigin E, Szold A, Allweis TM, Carmon M, Nissan S, Freund HR. How conservatively can postoperative small bowel obstruction be treated? *Am J Surg* 1993; **165**: 121-126
- Ellis H**. The clinical significance of adhesions: focus on intestinal obstruction. *Eur J Surg* 1997; **577**(Suppl): 5-9
- Menzies D**, Parker M, Hoare R, Knight A. Small bowel obstruction due to postoperative adhesions: treatment patterns and associated costs in 110 hospital admissions. *Ann R Coll Surg Engl* 2001; **83**: 40-46
- Ray NF**, Denton WG, Thamer M, Henderson SC, Perry S. Abdominal adhesiolysis: inpatient care and expenditures in the United States in 1994. *J Am Coll Surg* 1998; **186**: 1-9