The American Journal of Surgery (2008) 196, 23–27

The American Journal of Surgery®

Clinical Surgery-International

Predictive factors for surgical indication in adhesive small bowel obstruction

Shogo Tanaka, M.D.[a,*], Takatsugu Yamamoto, M.D.[a], Daisuke Kubota, M.D.[b], Mitsuharu Matsuyama, M.D.[b], Takahiro Uenishi, M.D.[a], Shoji Kubo, M.D.[c], Koichi Ono, M.D.[a]

[a]Department of Surgery, Ishikiriseiki Hospital, 18-28 Yayoicho, Higashiosaka 579-8026, Osaka, Japan; [b]Department of Surgery, Joto Central Hospital, Osaka, Japan; [c]Department of Hepato-Biliary-Pancreatic Surgery, Osaka City University Graduate School of Medicine, Osaka, Japan

KEYWORDS:
Ileus;
Strangulation;
Timing of surgery

Abstract

BACKGROUND: Small bowel obstruction (SBO) after abdominal surgery is usually treated successfully with intestinal decompression using a long nasointestinal tube (LT), but some cases fail to respond.

METHODS: Clinical background and laboratory data on admission were evaluated retrospectively for 53 patients with adhesive SBO to determine predictive factors for failure of LT decompression, and the appropriate timing of laparotomy was investigated.

RESULTS: Complete SBO (no evidence of air within the large bowel) and increased serum creatine phosphokinase (≥130 IU/L) were independent predictive factors for LT decompression failure. Laparotomy was indicated in 14 patients (9 and 5 with complete and partial SBO, respectively), whereas successful LT decompression occurred in 39 patients (9 and 30, respectively). Resolution of SBO took significantly longer for complete SBO (6.3 days) than for partial SBO (2.6 days).

CONCLUSIONS: Patients with complete SBO or high serum creatine phosphokinase (CPK) may not respond to LT decompression. Laparotomy is appropriate after non-response for 7 and 3 days for complete and partial SBO, respectively.

Small bowel obstruction (SBO) is usually caused by postoperative adhesions that develop in about 95% of adult patients after abdominal surgery.[1] At one time, immediate laparotomy was performed in almost all cases of SBO,[2,3] but recent studies on the natural history of adhesive SBO have shown that more than 50% of cases resolve with a conservative, non-operative approach using intravenous hydration, decompression with a short nasogastric tube or long nasointestinal tube (LT), or temporary elimination of oral nourishment.[4–7] In particular, LT decompression has been shown to be successful in greater than 70% of patients with SBO,[7–10] but surgical treatment may still be required in some patients because of significant complications, such as strangulation, or the failure of conservative management.[4–6,11] However, predictive factors for failure of LT decompression (leading to surgical indication) and the timing of subsequent laparotomy have not been established.

In this study, patients with adhesive SBO after abdominal surgery who were treated with LT decompression were investigated retrospectively to determine predictive factors for a lack of response (surgical indication) and to examine the appropriate timing for surgery.

* Corresponding author. Tel.: +81-72-988-3121; fax: +81-72-988-3119.

E-mail address: m8827074@msic.med.osaka-cu.ac.jp

0002-9610/$ - see front matter © 2008 Elsevier Inc. All rights reserved.
doi:10.1016/j.amjsurg.2007.05.048

Table 1 Characteristic of 53 patients with adhesive small bowel obstruction

Variable	No. of patients or values
Background	
Mean age, y (range)	66.9 (17–91)
Gender (male/female)	29/24
Comorbidities	
Cardiac diseases	6
Cerebral diseases	7
Past postoperative adhesive small bowel obstruction	21
No. of past laparotomies	
1	47
2	5
3	1
Past laparotomy	
Colorectal surgery	11
Appendectomy	12
Cholecystectomy	4
Gastroduodenal surgery	13
Small bowel resection	6
Gynecological surgery	6
Other abdominal surgery	5
Unknown	3
Complete small bowel obstruction	18
Laboratory data on admission	
White blood cell count ($x10^3$/dL)*	9.2 (5.5, 17.0)
C reactive protein (mg/dL)*	0.2 (0.1, 7.1)
Blood sugar (mg/dL)*	134 (94, 216)
Amylase (IU/L)*	109 (60, 164)
CPK (IU/L)*	>56 (28, 134)
Blood urea nitrogen (mg/dL)*	17.9 (9.8, 37.7)

*Results are given as medians, with 10th and 90th percentiles.

Patients and Methods

The clinical records of 53 patients with adhesive SBO after abdominal surgery who were treated with LT decompression between April 2003 and April 2006 were reviewed retrospectively. SBO was diagnosed by abdominal radiography, including x-ray and computed tomography on admission. Patients who had early postoperative SBO (occurring <30 days after surgery) or SBO in conjunction with Crohn's disease, documented malignancy, incarcerated hernia, or mesenteric vascular disease were excluded from the study. Patients with SBO who were suspected of harboring an ischemic bowel because of abdominal tenderness, fever, tachycardia, or leukocytosis underwent an immediate operation and were also excluded from the study, as were patients who underwent decompression with a nasogastric tube.

The 53 patients (29 males and 24 females) had a mean age of 67 years (range 17 to 91 years). The clinical characteristics of the patients, including comorbidities, prevalence of past SBO, number of past laparotomies, and types of abdominal surgeries, are shown in Table 1. Complete SBO was defined as no clear-cut evidence of air within the large bowel on abdominal radiographs, and partial SBO was defined as unequivocal evidence of gas in the colon above the level of peritoneal reflection on abdominal radiographs. Based on these definitions, 18 patients were diagnosed with complete SBO and 35 patients with partial SBO. Blood chemistry and laboratory tests, including white blood cell count, blood sugar level, and serum concentrations of C-reactive protein, amylase, creatine phosphokinase (CPK), and blood urea nitrogen, were performed for all 53 patients at admission.

Decompression with a LT (Ileus Tube, Sumitomo Bakelite Co, Akita, Japan) was performed within 6 hours from admission. The LT is 300 cm long, Fr 16 (Fig. 1). It is similar to "Gowen decompression tube".[12] The tube has 3 channnels: a main channel, a sump channel, and the balloon channel. The LT was inserted from nose to stomach, and suction of the content under fluoroscopy. Wire was inserted into the main channel to the tips and LT was advanced to duodenum through pyrolic ring, and to Trietz ligament. In jejunum, balloon was inflated with water until it engaged the wall of the bowel; usually 20 mL of water was required. From the balloon channel, a maximum of 30 mL of water can be inflated (30 mm in diameter). The LT was advanced as far as possible. From the sump channel, there was constant bubbling that confirmed the patency of the main channel. Finally, the wire was removed. Decompression with the LT was performed by producing spontaneous negative pressure at the height of the bed, and by forced negative pressure

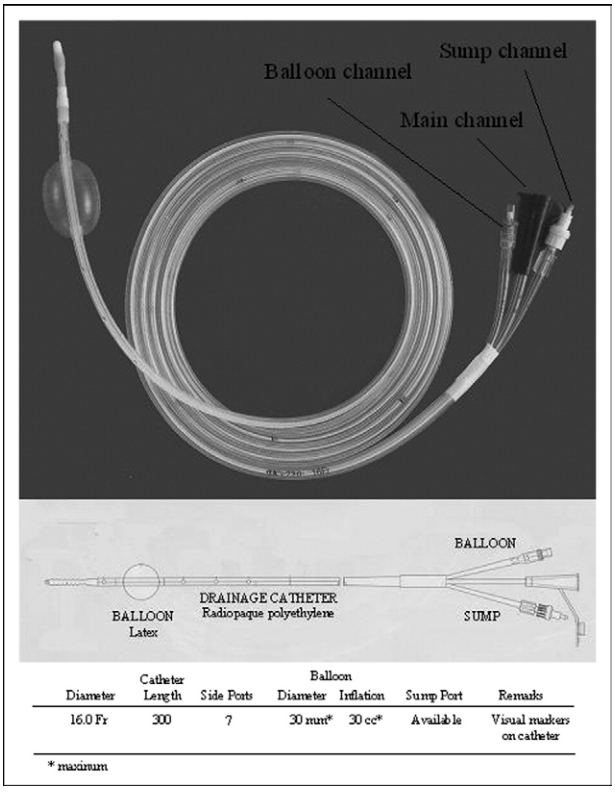

Figure 1 A long nasointestinal tube (Ileus Tube®). The tube has 3 channels: a main channel, a sump channel, and the balloon channel. Drainage occurs proximal and distal to the balloon. (Provided by Sumitomo Bakelite Co., Akita, Japan)