

Acute Colorectal Obstruction Treated by Means of Transanal Drainage Tube: Effectiveness Before Surgery and Stenting

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OBJECTIVES: The aim of this study was to clarify the usefulness of the management of acute colorectal obstruction using a transanal drainage tube before surgery or stenting.

METHODS: Fifty-four patients (34 males and 20 females, aged 46–94 yr, mean = 69.7) treated between May 1998 and March 2004 for acute colorectal obstruction were identified in a colorectal obstruction database, and their clinical and radiological features were reviewed. Based on abdominal computed tomography findings, urgent colonoscopy was performed. Subsequently, endoscopic decompression using a Dennis® Colorectal Tube (DCT) was attempted.

RESULTS: Endoscopic decompression using the DCT was technically successful in 52 of 54 patients (96.3%). The site of obstruction was the cecum in 4, the ascending colon in 2, the transverse colon in 7, the descending colon in 11, the sigmoid colon in 18, and the rectum in 12. The etiology of obstruction was primary colorectal carcinoma in 45, non-colonic metastatic carcinoma in 4, postoperative obstruction in 4, and retrograde intussusception in 1. Following adequate cleansing of the colon, 44 patients underwent a one-stage surgery after 7 ± 3 days (SD; range, 4–10 days). Stenting was successfully used as the final palliative treatment in 4. The use of the DCT alone relieved postoperative stenosis (3 patients) and retrograde intussusception (Prognosis in patients with obstructing colorectal carcinoma. *Am J Surg* 1982;143:742–7). During these treatments, perforation occurred in one patient with postoperative stenosis of the cecum.

CONCLUSIONS: Management of acute colorectal obstruction using the DCT was found to be effective and safe, irrespective of the site or etiology of the obstruction. Therefore, this procedure should be considered as a primary method for decompression of the obstructed colon before considering surgery or stenting.

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INTRODUCTION

Acute colorectal obstruction is a potentially life-threatening emergency, irrespective of the presence of benign or malignant disease. Additionally, many patients are elderly, dehydrated, experiencing electrolyte imbalance, or unstable due to concomitant diseases, which make this group a poor operative risk for major surgery (1, 2). Therefore, the initial diagnosis and primary procedures for patients with acute colorectal obstruction markedly affect their prognosis. Abdominal computed tomography (CT) is very useful for the initial diagnosis because it can discriminate the colorectal obstruction from an obstruction of the small intestine (3).

Although colostomy is useful, it requires two-step surgery and it is a costly and time-consuming procedure. One-step

surgery, on the other hand, often causes postoperative complications such as operative leakage, postoperative stenosis, and poor general condition, resulting in high rates of morbidity and mortality (2). Endoscopic decompression using a transanal drainage tube has been used in cases of acute obstruction of the rectum and left colon to avoid two-stage surgery (4–6). Expandable metallic stents have also been used to relieve malignant colorectal obstruction (7–12). Generally, however, they are not indicated for obstruction of the right colon or benign diseases (12).

Recently, regardless of the site of colorectal obstruction, the development of a new transanal drainage tube and techniques for its use has made it possible to endoscopically decompress acute colorectal obstructions (13–15). The aim of the present study was to clarify the usefulness of the management of acute colorectal obstruction using the transanal

drainage tube as the primary method before surgery or stenting.

MATERIALS AND METHODS

Patients

Fifty-four patients (34 males and 20 females, aged 46–94 yr, mean = 69.7) treated between May 1998 and March 2004 for acute colorectal obstruction were identified in a colorectal obstruction database at our institution, and their cases were reviewed. In all 54 patients, the symptoms were abdominal pain, abdominal fullness, vomiting, and constipation. Physical examination showed a distended and tympanic abdomen. Plain abdominal x-ray revealed a distended large bowel and an air-fluid level. All patients were hospitalized and abdominal CT revealed the site and etiology of acute bowel obstruction. Based on CT findings, urgent colonoscopy was performed for the diagnosis and management of acute colorectal obstruction. A cleansing enema was administered to patients when the obstruction was suspected to be proximal to the splenic flexure based on CT findings. Irrespective of etiology, endoscopic decompression using the transanal drainage tube was attempted in all 54 patients. Informed consent was obtained from each.

Procedure

The transanal drainage tube used in the present study was a Dennis® Colorectal Tube (DCT), 7.3 mm (22 Fr) in outer diameter and 120 cm in length (Nippon Sherwood, Tokyo, Japan) (13–15). A flexible tapered tip is attached to the distal end of the tube. Six holes are present on the side of the tube for decompression. A 0.052-inch guidewire, 350 cm in length, is equipped with the DCT. The DCT is a single-use device. In this procedure the sliding tube (overtube), 20 mm in outer diameter and 26 cm in length (ST-C3S, Olympus), the guidewire catheter (2.7 mm, 8 Fr), and the dilator (26 Fr) (Create Medic Co., Yokohama, Japan) were useful. The technique we developed for the management of acute colorectal obstruction has previously been reported (14, 15). A colonoscope (CF230I or CF240I; Olympus, Tokyo, Japan) is inserted and advanced to the site of the tumor. When the obstruction is expected to be proximal to the splenic flexure of the colon based on CT findings, the overtube is held on the colonoscope but outside of the patient until the overtube is ready to be inserted. Water-soluble contrast material is injected proximal to the stricture. A black hole or small gas bubbles escaping from the obstructed segment identify the obstructed lumen. Under fluoroscopic and endoscopic guidance, the equipped 0.052-inch guidewire is then introduced through the tumor beyond the point of obstruction. After the guidewire is positioned and the overtube is inserted, the colonoscope is withdrawn. Under fluoroscopic control, the well-lubricated DCT is introduced over the guidewire through the overtube and then advanced beyond the tumor. The balloon at the tip of the DCT is insufflated with 30 mL of saline and the DCT is fixed. The overtube

is withdrawn. The immediate escape of air and liquid feces through the tube indicates successful decompression.

When a complete obstruction is located in the sigmoid colon, the additional use of other devices and techniques may be useful. It is important to obtain a retrograde radiographic view using small-diameter upper endoscopes and water-soluble contrast material to evaluate the length of the stricture, the degree, and the anatomy of the obstruction. If the obstructed lumen is obscure, a hydrophilic biliary guidewire preloaded through a standard biliary catheter is used to traverse the stricture. Once the wire has passed through the stricture and is recognized fluoroscopically by the anatomically correct position of the wire passing into an air-filled, dilated proximal bowel, the catheter is advanced over the guidewire through the lesion. At this point, the biliary catheter is exchanged for the guidewire catheter in order to use the 0.052-inch guidewire. And then, the dilator is inserted. Finally, after the reduction of the loop of the sigmoid colon, the DCT is deployed.

After the Tube Placement

Immediately following the tube placement, the obstructed colon is irrigated using approximately 10 L of warm tap water. It usually takes at least 1 h to irrigate the obstructed colon. Two days after the tube placement, 500 mL of a polyethylene glycol solution can be given orally for adequate cleansing. After the colorectal obstruction is relieved, a barium study of the proximal colon is performed to rule out the possibility of synchronous carcinoma. In our patients, one-stage surgery or stenting was then selected based on patients' clinical condition.

RESULTS

Endoscopic decompression by means of the DCT was technically successful in 52 of our 54 patients (96.3%). In the remaining two patients, perforation occurred in one patient with postoperative stenosis of the cecum, and the tube placement was unsuccessful in another patient with primary cecal cancer. CT for initial diagnosis was very useful in differentiating acute colorectal obstruction from obstruction of the small intestine as well as for evaluating the etiology of the obstruction (Figs. 1A and 2A). The site of obstruction was the cecum in 4 patients, the ascending colon in 2, the transverse colon in 7, the descending colon in 11, the sigmoid colon in 18, and the rectum in 12. The overtube was useful in 13 patients with obstruction of the right colon (Figs. 1C and 2C). When a complete obstruction was located in the sigmoid colon, a hydrophilic biliary guidewire preloaded through a standard biliary catheter under the use of upper endoscope was used to traverse the stricture. And the use of the dilator was very helpful for the tube placement. The etiology of obstruction was primary colorectal carcinoma in 45, non-colonic metastatic carcinoma in 4, postoperative obstruction

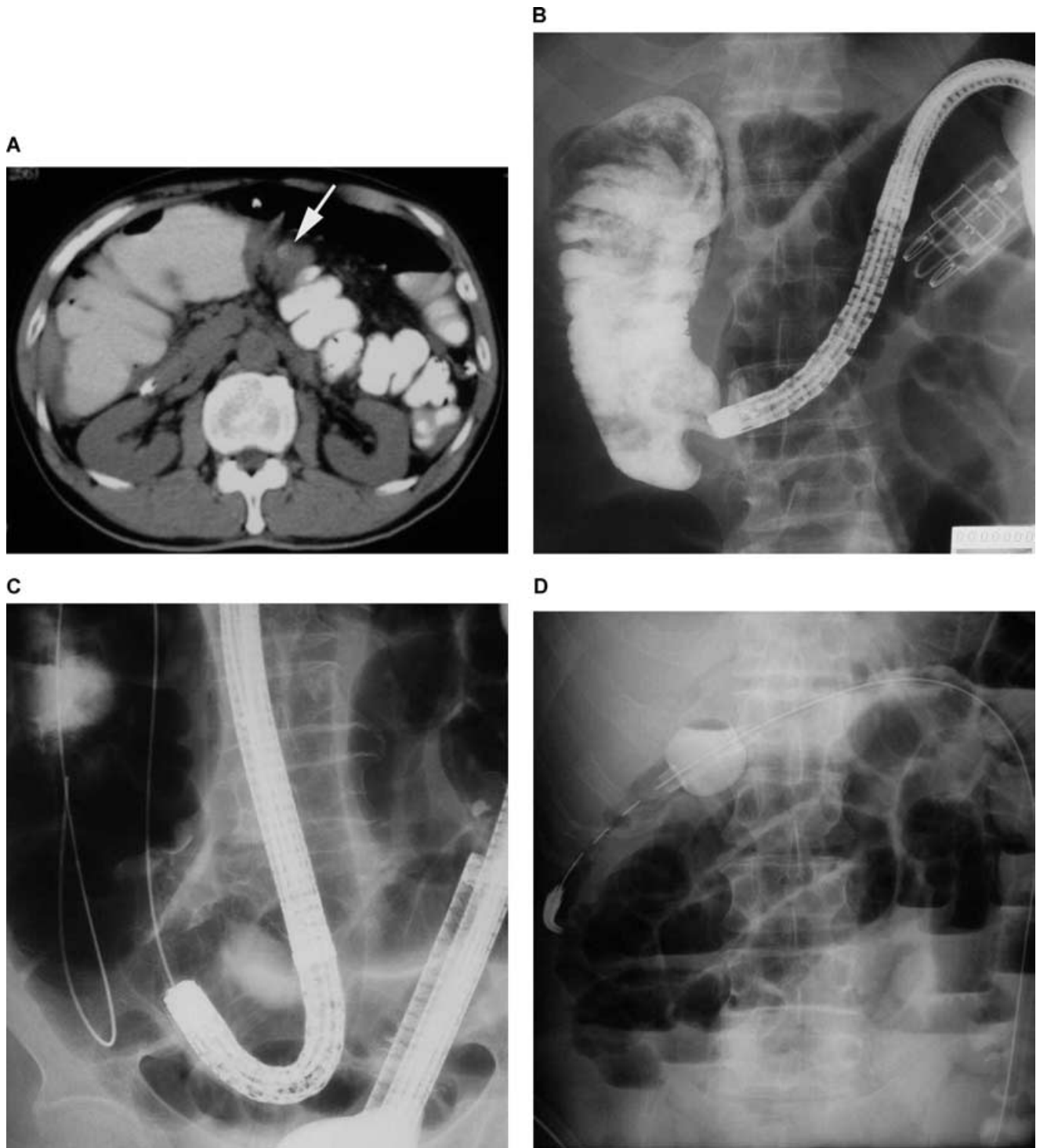


Figure 1. (A) Abdominal CT showing transverse colon carcinoma (arrow), (B) radiograph showing the site of obstruction in the transverse colon, (C) radiograph showing a flexible guidewire introduced through the tumor under a colonoscope on which the sliding tube (overtube) is held, and (D) radiograph showing the Dennis Colorectal Tube (DCT) positioned proximally to the tumor.

in 4, and retrograde intussusception in 1. All 52 successful patients showed marked improvement in abdominal symptoms shortly after the tube placement, and repeat abdominal x-ray showed a reduction of the colonic distention. However, the tube replacement was necessary in 2 patients because the

balloon of the DCT broke 2 or 3 days after the initial placement.

Following adequate cleansing of the colon, 43 (97.7%) of 44 patients with primary colorectal carcinoma underwent one-stage surgery after 7 ± 3 days (SD; range, 4–10 days).

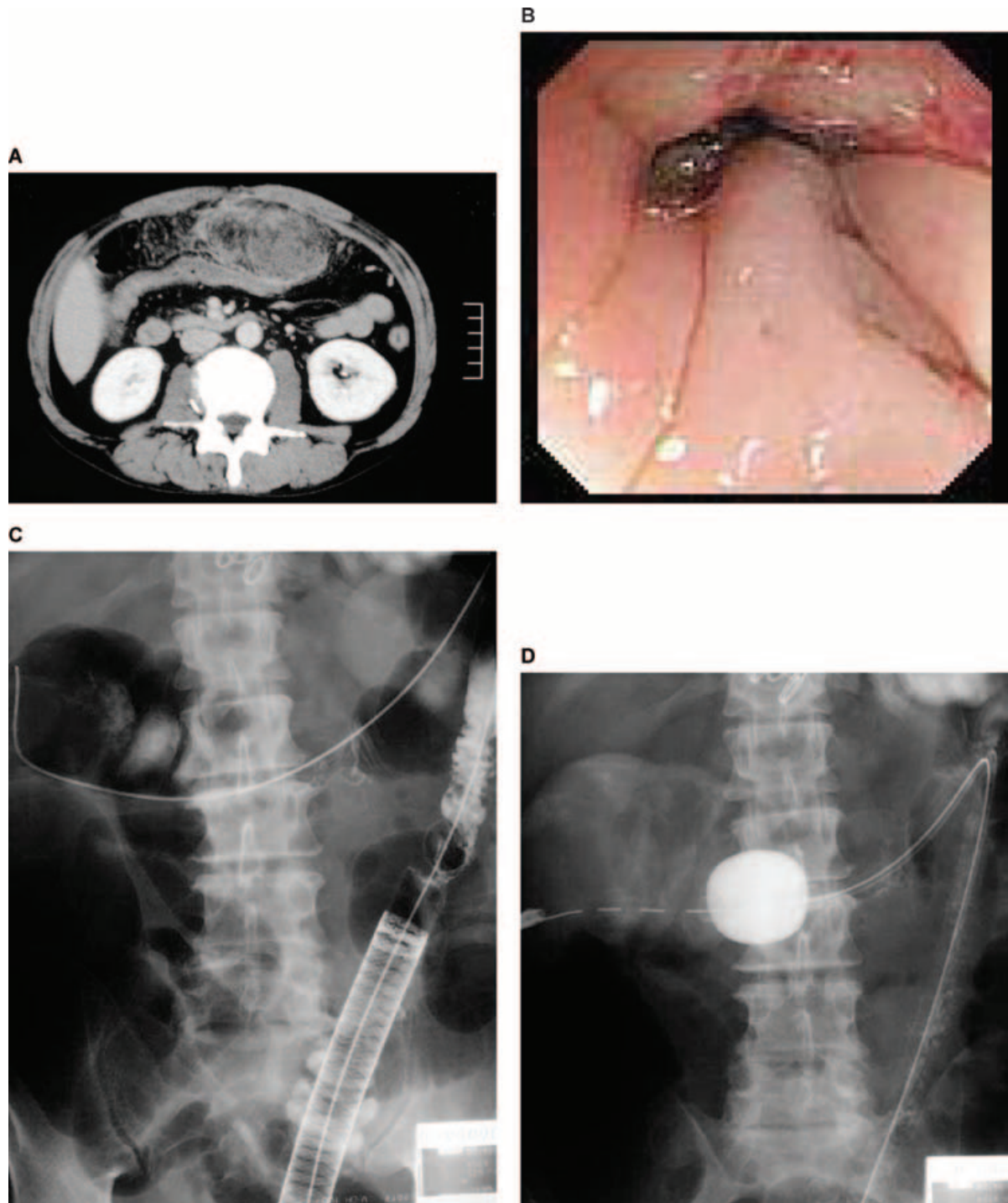


Figure 2. (A) CT showing a giant abscess from the great omentum, (B) colonoscopy showing postoperative stenosis of the transverse colon, (C) radiographic view of a flexible guidewire introduced through the obstruction with the sliding tube (overtube) in place, and (D) the DCT was successfully placed for decompression.

In the one remaining patient, a 91-yr-old man with rectal cancer, colostomy alone was performed. No anastomotic leakage or postoperative stenosis occurred after operation. Self-expandable metallic stent placement was used as a final palliative treatment in 4 patients whose etiology was non-colonic metastatic carcinoma (pancreatic carcinoma, 2 patients; gynecological malignancy, 2 patients). The patency

of stents lasted a mean of 148 ± 98 days ($n = 4$; range, 38–344 days). Postoperative stenosis in 3 patients and retrograde intussusception in 1 patient (16) were treated by the use of the DCT alone. In a 56-yr-old man who was a heavy drinker and had severe abdominal pain and fever, abdominal CT showed an abscess from the great omentum (Fig. 2A). Twelve days after successful operation, the patient

experienced abdominal fullness. Colonoscopy showed post-operative stenosis (Fig. 2B). Five days after the tube placement (Fig. 2D), his symptoms disappeared and the tube was removed. Follow-up colonoscopy showed no stenosis after 6 months.

DISCUSSION

Acute colorectal obstruction is potentially life-threatening, irrespective of the presence of benign or malignant disease. Colorectal carcinoma in particular is a common malignancy that results in significant morbidity and mortality. The septic nature of the colonic content coupled with the friable condition of the obstructed bowel wall makes primary resection and anastomosis hazardous. The traditional treatment is to decompress the colon by performing different kinds of colostomies. Thus, two laparotomies are required in this group of high-risk patients (1, 2).

On the other hand, the usefulness of endoscopic decompression using self-expandable metallic stents has been well reported (7–12). As a preoperative treatment as well as a palliative treatment, the placement of a metallic stent seems to be effective for decompression. Although the colorectal stent placement was successful in 85–95% of the patients, it is generally not indicated for obstruction of the right colon or benign diseases (10–12). Metallic stents for the right colon are not commercially available. In addition, stenting was complicated by perforation in 0–7%, stent migration in 3–22%, bleeding in 0–5%, and reobstruction in 0–15% (10, 11). Therefore, the success rate with the DCT seems to be better than that with a metallic stent. Tube placement with the DCT may be safer than stent placement, although the tube placement caused colonic perforation in this study and in one other report (17). Furthermore, stent placement may be too expensive for preoperative treatment; the cost of DCT is one-fourth that of an expandable metallic stent.

Endoscopic treatment using the DCT easily achieved effective decompression of the obstructed left and sigmoid colon and allowed one-stage surgery. Abdominal CT findings were particularly useful in identifying the site and etiology of the obstruction. When the obstruction was located proximally to the splenic flexure of the colon, an overtube was very helpful (Figs. 1C and 2C). However, the overtube should never be inserted forcefully. If any resistance is encountered, further insertion of the overtube should not be carried out, especially in patients with diverticular disease or stricture, or those who have undergone several abdominal procedures. If the overtube is utilized with the aid of a colonoscope, endoscopic decompression of the obstructed right colon may be successful. If endoscopists fear that the procedure in the case of obstruction of the right colon would leave the patient exposed to the risk of perforation of the bowel, a long nasogastric tube, which may be insufficient for decompression itself, might nevertheless minimize the risk of perforation; thus, its introduction is recommended before endoscopic decompression using the DCT in right colonic obstructions (14).

In other conditions involving acute colonic obstruction, such as volvulus of the sigmoid colon and colonic pseudo-obstruction, an attempt at non-surgical decompression is always preferable (18). In such cases, decompression using a long nasogastric tube is frequently ineffective. Since the new material and techniques we developed provide the possibility of achieving cecal decompression, the procedure may be useful in the treatment of pseudo-obstruction.

In conclusion, management of acute colorectal obstruction using the DCT was found to be effective and safe, irrespective of the etiology or site of the obstruction. Therefore, this procedure should be considered as a primary method for decompression of the obstructed colon before considering surgery or stenting.

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