Diagnostic Laparoscopy and Laparoscopic Cecostomy for Colonic Pseudo-Obstruction

Quan-Yang Duh, M.D., Lawrence W. Way, M.D.

From the Department of Surgery, University of California, San Francisco and the Surgical Service, Veterans Affairs Medical Center, San Francisco, California

Marked cecal dilatation due to colonic pseudo-obstruction (Ogilvie's syndrome) is most often treated by colonoscopic decompression. When this fails, cecostomy is usually indicated if the bowel is not infarcted. We describe a new technique of laparoscopy-guided percutaneous cecostomy using T-fasteners to retract and anchor the cecum to the anterior abdominal wall and using a Foley catheter as a cecostomy tube. We performed this procedure successfully in a patient with colonic pseudo-obstruction who had marked cecal dilatation that could not be decompressed by colonoscopy. Laparoscopic inspection showed that the cecum was viable, and a laparoscopic cecostomy was placed. This procedure can be performed easily and safely and with much less morbidity than laparotomy and open cecostomy. [Key words: Laparoscopy; Diagnostic laparoscopy; Therapeutic laparoscopy; Cecostomy; Colonic pseudo-obstruction; Ogilvie's syndrome; T-fasteners; Surgical technique]

Duh Q-Y, Way LW. Diagnostic laparoscopy and laparoscopic cecostomy for colonic pseudo-obstruction. Dis Colon Rectum 1993;36:65–70.

Colonic pseudo-obstruction (Ogilvie's syndrome) is common in elderly, debilitated patients following surgery, major trauma, or sepsis.[1,2] Treatment consists of decompression by nasogastric and rectal tubes for mild cases, but, if this fails or if the cecum is greatly dilated (>9–12 cm in diameter), the colon should be decompressed directly. This is most readily accomplished by colonoscopy,[3–9] which is successful in about 85 percent of cases, although a second or third session may be required. If colonoscopy is unsuccessful, however, or if there is a concern about cecal perforation, exploratory laparotomy is indicated. Infarction or perforation calls for resection, but, if the cecum is viable, a cecostomy should be performed.[10]

We have reported a laparoscopic technique for gastrostomies and jejunostomies using T-fasteners to retract and anchor the bowel.[11] A similar approach has been used successfully to place a cecostomy in a patient with colonic pseudo-obstruction in whom colonoscopic decompression was unsuccessful.

REPORT OF A CASE

A 78-year-old Caucasian man had an uncomplicated left total knee arthroplasty for degenerative joint disease. Pneumonia developed three days after the operation, and he required endotracheal intubation and mechanical ventilation. His abdomen then gradually became distended, and a radiograph showed a diffusely dilated colon with a cecal diameter of 15 cm (Fig. 1). Colonoscopy was performed, but the scope could not be advanced beyond the hepatic flexure, and the cecum could only be partially decompressed (to 10 cm). Another colonoscopy was performed, but again it was impossible to negotiate the hepatic flexure. A long tube was left at the hepatic flexure, but this did not further diminish the size of the cecum (Fig. 2). Right lower quadrant tenderness developed. At this point a diagnostic laparoscopy was performed, and it revealed a markedly dilated cecum with small serosal tears and a blotchy ischemic appearance but no sign of infarction. A cecostomy was constructed under laparoscopic guidance by the technique described below (Fig. 3), and the patient recovered.

Supported in part by the Medical Research Service of the Veterans Affairs Medical Center, San Francisco, California.
Address reprint requests to Dr. Duh: Surgical Service (112), Veterans Affairs Medical Center, 4150 Clement Street, San Francisco, California 94121.

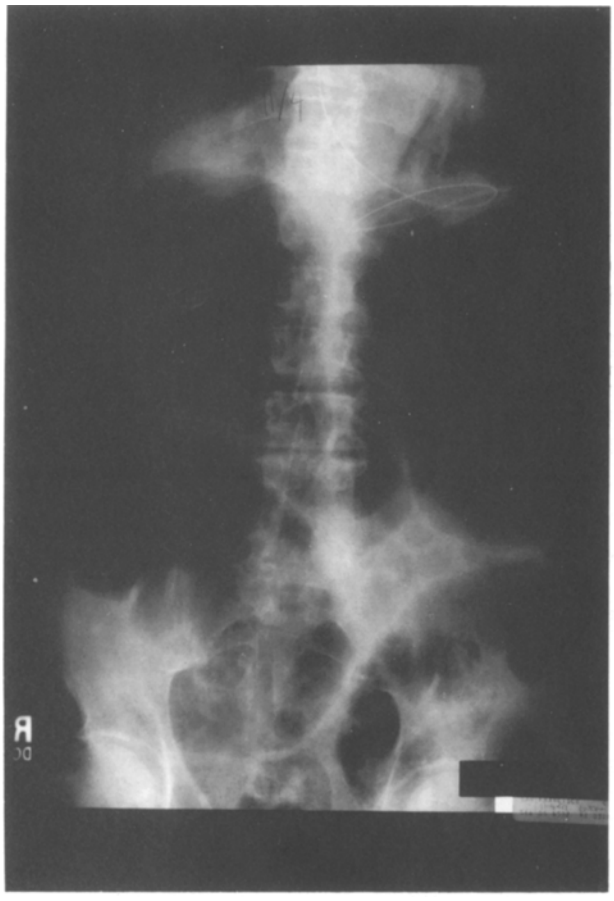

Figure 1. Radiograph of the patient with colonic pseudo-obstruction. The colon was diffusely dilated, and the cecal diameter was 15 cm.

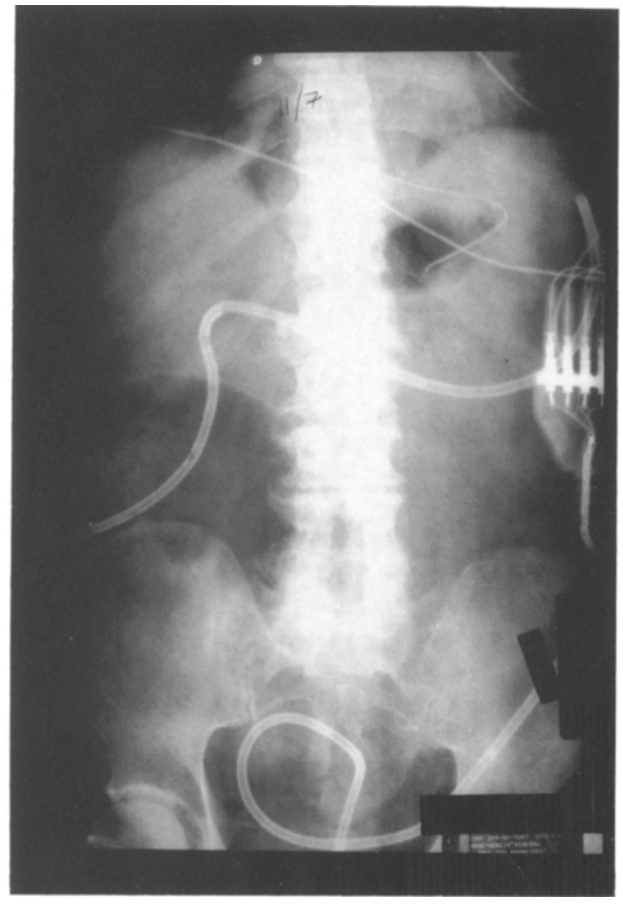

Figure 2. Radiograph of the patient after a long tube was placed in the hepatic flexure of the colon. The cecum remained dilated at 11 cm.

TECHNIQUE

The patient was prepared as usual for laparoscopic surgery, and a prophylactic antibiotic (cefotetan) was administered intravenously. We used general anesthesia, but previous experience in similar operations has shown that local anesthesia would suffice in some cases. The stomach and urinary bladder were intubated and decompressed. A pneumoperitoneum was established to 15 mmHg with CO_2. A 10-mm trocar was inserted in the subumbilical position, and a 30° laparoscope was introduced.

The colon, especially the cecum, was evaluated for evidence of infarction. If the bowel had been perforated or if perforation had appeared to be imminent, we would have opened the abdomen and performed a resection, but the cecum looked viable in this case. A 5-mm port was then inserted in the right anterior axillary line at the level of the umbilicus in order to introduce a grasper, which was used to retract and manipulate the intestine and omentum and to facilitate inspection of the entire intraperitoneal surface of the cecum. The grasper was also used to stabilize the cecum while placing the T-fasteners.

Four T-fasteners (Fig. 4; Flexiflo® Introducer Gastrostomy Kit, No. 50190; Ross Laboratories, Columbus, OH) were placed through the abdominal wall into the cecum in a diamond configuration about 4 cm apart to retract and anchor the cecum to the anterior abdominal wall. A slotted needle loaded with a T-fastener (a metal T-bar with a long nylon suture attached to its center) was passed through the abdominal wall and the wall of the cecum under laparoscopic view (Fig. 5). The T-fastener was then dislodged into the cecal lumen by a stylet, and the needle and the stylet were withdrawn. This left the T-bar in the cecal lumen attached to a nylon suture that exited the abdomen along the needle tract (Fig. 6). The pneumoperitoneum was decreased to 10 mmHg so the cecum could be drawn up against the anterior abdominal wall without tension.

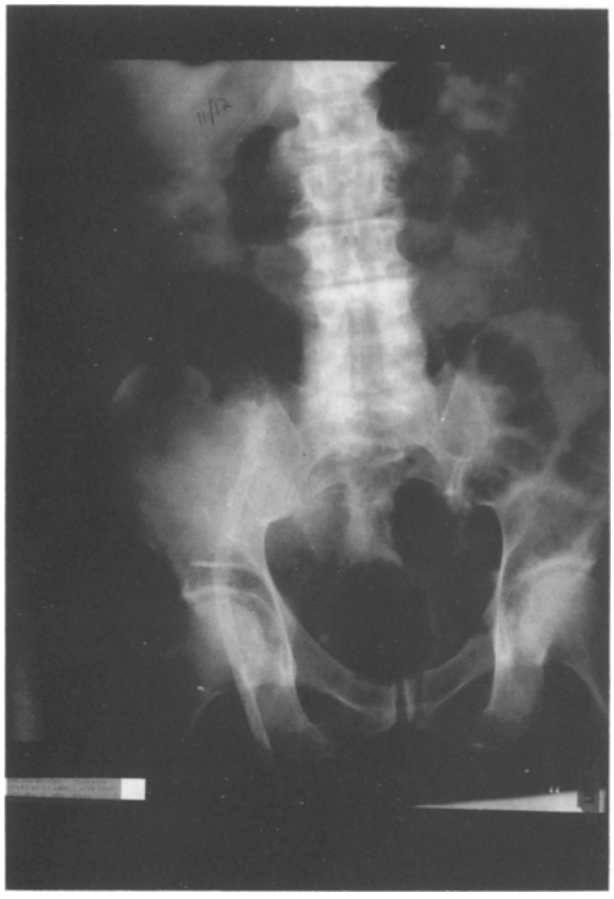

Figure 3. Radiograph of the patient after decompression by laparoscopic cecostomy. The metal bars of the T-fasteners anchoring the cecum and the cecostomy catheter are seen in the right lower quadrant.

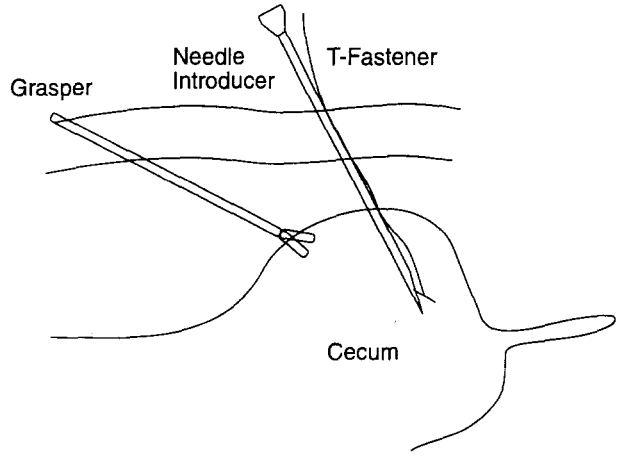

Figure 5. The slotted needle loaded with a T-fastener is passed through the abdominal wall and the wall of the cecum under laparoscopic view. A grasper is used to stabilize the cecum. The T-fastener is dislodged into the cecal lumen by the stylet.

The first T-fastener, the most difficult one to place, was inserted through a tenia coli for greater security. This one should be placed farthest from the laparoscope, because this facilitates insertion of the others. The cecum was stabilized with the grasper as the T-fasteners were inserted (Fig. 5). Once the cecum was drawn up against the abdominal wall by the T-fasteners, the cecostomy was created by an introducer technique. An 18-gauge needle was inserted through the center of the

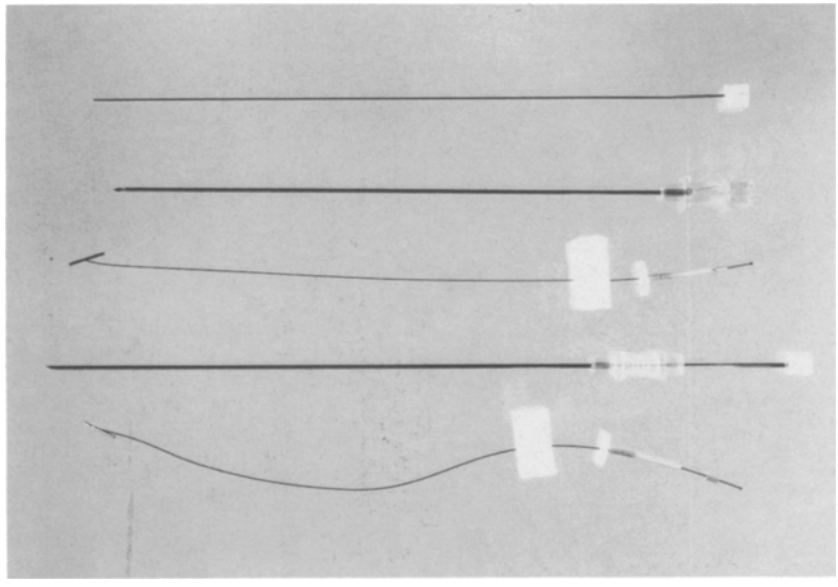

Figure 4. The T-fastener consists of a metal T-bar, 1 cm long and 1 mm in diameter, attached to a long nylon suture. It is mounted at the tip of a slotted needle. The stylet is used to dislodge the T-fastener after it is inserted.

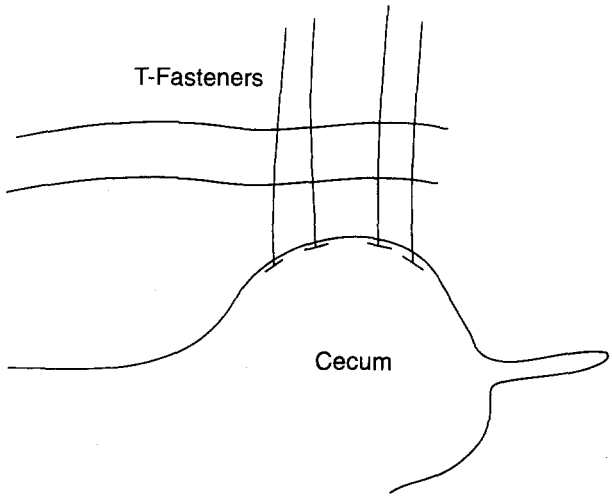

Figure 6. The needle and the stylet are withdrawn, leaving the T-bar in the cecal lumen. The T-bar is attached to the nylon suture that exited the abdomen along the needle tract. Three additional T-fasteners are placed in a diamond configuration about 4 cm apart.

diamond created by the T-fasteners on the abdominal wall and the cecum. A J-guide wire was introduced into the cecal lumen, and dilators were serially passed over the J-wire to create a tract (Fig. 7). The skin and subcutaneous tissue were generously incised at the cecostomy site to avoid wound infection.

The Foley catheter, stiffened by a stylet introducer, was then inserted into the cecum over the J-wire, and the balloon was inflated (Fig. 8). The cecum was then dropped carefully away from the abdominal wall by lessening tension on the T-fasteners to confirm that the catheter was in

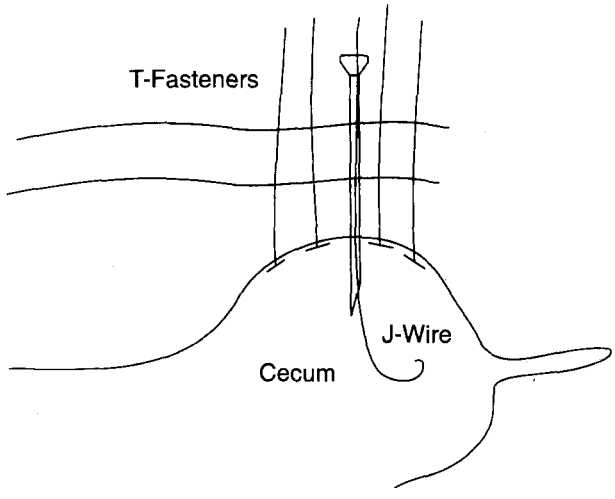

Figure 7. An 18-gauge needle is inserted through the center of the diamond created by the T-fasteners. A J-guide wire is introduced into the cecal lumen, and dilators are serially passed over the J-wire to create a tract.

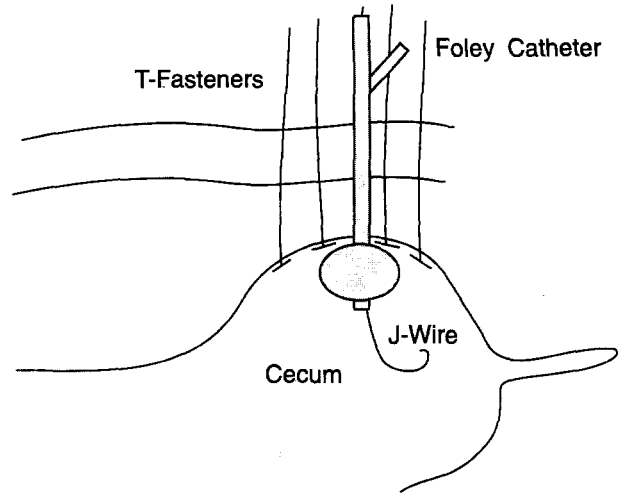

Figure 8. A Foley catheter, stiffened by a stylet introducer, is inserted into the cecum over the J-wire, and the balloon is inflated.

the right position. Catheter placement was also checked by a radiograph, and the possibility of leakage around the tube was checked by injecting contrast media into the cecum (Fig. 9). The T-

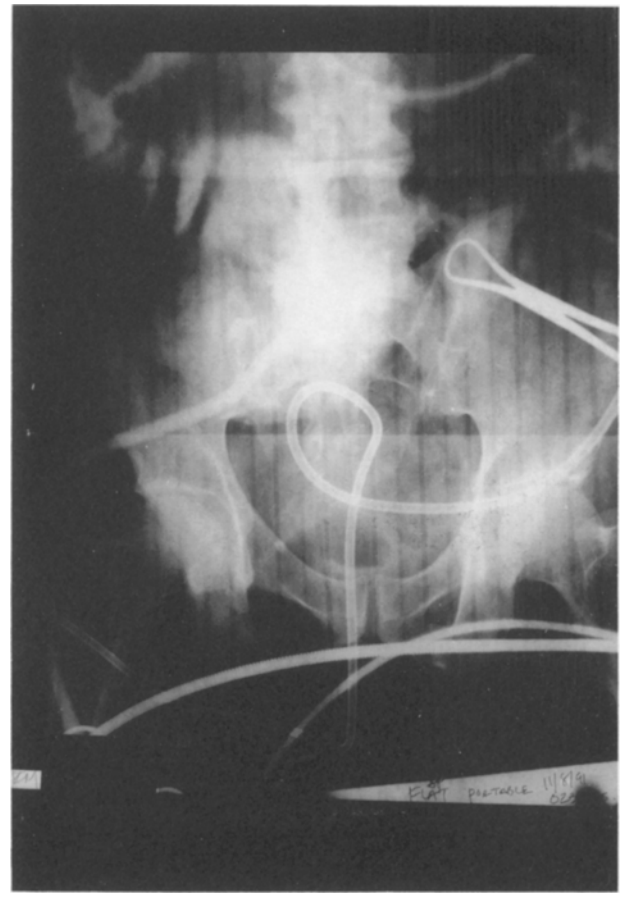

Figure 9. Radiograph of the patient after laparoscopic cecostomy. There was no extravasation of the contrast media.

fasteners were then secured with just enough tension to keep the cecum snugly against the abdominal wall.

The cecostomy catheter was connected to a bag for gravity drainage. Two weeks later, when the cecum was adherent to the abdominal wall, the T-fasteners were cut at the skin level, the sutures and bolsters were removed, and the metal T-bars were allowed to pass in the stool.

DISCUSSION

Pseudo-obstruction of the colon (Ogilvie's syndrome) with a massively dilated colon (greater than 9–12 cm) is a medical emergency. Although the exact risk of perforation is unknown, it is probably similar to that of mechanical colonic obstruction. Untreated, infarction and perforation of the cecum can develop, with peritonitis, sepsis, and death.[10]

The massively dilated colon can be decompressed by colonoscopic decompression alone[3–9] or by colonoscopic decompression and placement of a long colonic tube.[12] The 15 percent of patients who cannot be decompressed by colonoscopy require surgical therapy, which has included laparotomy and cecostomy or, if the bowel is infarcted, resection.

Operative cecostomy has a high rate of complications, and other methods of cecostomy have been tried. An interventional radiology technique involves percutaneous insertion of a tube guided by computed tomographic (CT) scans.[13–15] The cecum cannot be visually evaluated by this technique, however, so necrotic bowel can be missed, especially if there is no perforation. Furthermore, the security of the cecopexy and the resulting seal that must prevent leakage alongside the tube is of concern with this method.

Percutaneous endoscopic cecostomy has also been performed using a technique similar to that for percutaneous endoscopic gastrostomy (PEG).[16–18] But this procedure is not feasible when the cecum cannot be reached by the colonoscope, which occurs in the patients who are most likely to benefit from cecostomy.

The initial treatment of Ogilvie's syndrome should be conservative, with nasogastric suction, rectal tubes, and reversing of metabolic or narcotic-induced problems.[19] Many patients respond. If conservative treatment fails, if the diameter of the cecum is greater than 10 cm, or if pain and tenderness appear in the right lower quadrant, the colon should be decompressed by colonoscopy and placement of a long tube in the cecum. Recurrence can be treated by another colonoscopy. If colonoscopic treatment is unsuccessful, or if the patient develops signs of colon ischemia or perforation, a diagnostic laparoscopy should be the next step. If necrotic bowel is found, laparotomy and bowel resection are indicated. Otherwise a cecostomy catheter can be placed under laparoscopic guidance using the technique described in this paper.

Our method of diagnostic laparoscopy and laparoscopic cecostomy has advantages over other approaches. The bowel can be examined visually so as not to miss an infarcted cecum; colonoscopy is not necessary to guide the procedure; laparotomy is avoided in the absence of bowel infarction; and patients tolerate laparoscopy better than laparotomy. Any surgeon experienced in laparoscopic surgery should be able to perform this procedure.

REFERENCES

1. Ogilvie H. Large intestine colic due to sympathetic deprivation. BMJ 1948;2:671–3.
2. Anuras S, Shirazi SS. Colonic pseudoobstruction. Am J Gastroenterol 1984;79:525–32.
3. Kokura JS, Dent TL. Colonoscopic decompression of massive nonobstructive cecal dilatation. Arch Surg 1977;112:512–7.
4. Starling JR. Treatment of nontoxic megacolon by colonoscopy. Surgery 1983;94:677–82.
5. Bode WE, Beart RW Jr, Spencer RJ, Culp CE, Wolff BG, Taylor BM. Colonoscopic decompression for acute pseudoobstruction of the colon (Ogilvie's syndrome). Am J Surg 1984;147:243–5.
6. Nakhgevany KB. Colonoscopic decompression of the colon in patients with Ogilvie's syndrome. Am J Surg 1984;148:317–20.
7. Wegener M, Borsh G. Acute colonic pseudoobstruction (Ogilvie's syndrome) presentation of 14 of our cases and analysis of 1027 cases reported in the literature. Surg Endosc 1987;1:169–74.
8. Strodel WE, Brothers T. Colonoscopic decompression of pseudoobstruction and volvulus. Surg Clin North Am 1989;69:1327–35.
9. Grosche JR, Sharpe JN, Larson GM. Colonoscopic decompression for pseudo-obstruction of the colon. Am Surg 1989;55:111–5.
10. Geelhoed GW. Colonic pseudo-obstruction in surgical patients. Am J Surg 1985;149:258–65.
11. Duh QY, Way LW. Laparoscopic jejunostomy using T-fasteners as retractors and anchors. Arch Surg (in press).

12. Nano D, Prindiville T, Pauy M, Chow H, Ross K, Trudeau W. Colonoscopic therapy of acute pseudoobstruction of the colon. Am J Gastroenterol 1987;82:145–8.
13. Crass JR, Simmons RL, Frick MP, Maile CW. Percutaneous decompression of the colon using CT guidance in Ogilvie syndrome. AJR 1985;144:475–6.
14. Casola G, Withers C, vanSonnenberg E, Herba MJ, Saba RM, Brown RA. Percutaneous cecostomy for decompression of the massively dilated cecum. Radiology 1986;158:793–4.
15. vanSonnenberg E, Varney RR, Casola G, *et al.* Percutaneous cecostomy for Ogilvie syndrome: laboratory observations and clinical experience. Radiology 1990;175:679–82.
16. Ponsky JL, Aszodi A, Perse D. Percutaneous endoscopic cecostomy: a new approach to nonobstructive colonic dilatation. Gastrointest Endosc 1986;32: 108–11.
17. Ganc AJ, Net AJ, Morrell AC, Plapler H, Ardenh JC. Transcolonoscopic extraperitoneal cecostomy. A new therapeutic and technical proposal. Endoscopy 1988;20:309–12.
18. Salm R, Rukauser K, Walkmann D, Farthmann EH. Endoscopic percutaneous cecostomy (EPC). Surg Endosc 1988;2:92–5.
19. Sloyer AF, Panella VS, Demas BE, *et al.* Ogilvie's syndrome successful management without colonoscopy. Dig Dis Sci 1988;33:11–6.