Percutaneous Cecostomy: A New Technique in the Management of Fecal Incontinence

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● **A pilot study on the percutaneous introduction of a cecostomy tube for colonic irrigations in the treatment of children with fecal incontinence is described. The results were good, and the technique is recommended for certain patients.**

INDEX WORDS: Fecal incontinence, colonic irrigation, cecostomy.

FECAL INCONTINENCE is encountered in all age groups. In children it may be the consequence of spina bifida, a result of operations on the anus, rectum, or spine, or a result of trauma. Severe constipation may cause fecal incontinence in the form of encopresis. In older individuals, fecal incontinence is encountered under a variety of conditions, including those mentioned above. The consequences of this socially distasteful disability are devastating to the patient and to his or her family. To date, the most predictable method of management has been the complete emptying of the entire colon, at a time of the patient's choosing, by use of a large-volume enema.[1] Thus, no bowel contents would be unpredictably (and humiliatingly) evacuated. Controlled evacuation is achieved by the administration of such an enema, given at regular intervals, several times a week. The administration of an enema to a person who lacks tone in the anal sphincters is almost impossible without some sort of inflatable retention device inserted into the anal canal. Many patients, especially teenagers, find this method tedious and bothersome, and subsequently abandon it, despite its success in achieving continence. They prefer to accept the antisocial consequences of being incontinent of feces. Recently, as an alternative to the enema, an operation that uses the appendix as a conduit for the administration of irrigating fluid was developed.[2] However, many children with spina bifida (for example) already have undergone various orthopedic, urologic, and neurosurgical procedures, and thus the parents are understandably reluctant to have their children undergo yet another operation. Furthermore, for the elderly incontinent patient, an operation is not likely to be undertaken.

We performed a pilot study to determine the feasibility of a percutaneously inserted cecostomy tube (c-tube) for the antegrade administration of colonic irrigations in the management of fecal incontinence.

MATERIALS AND METHODS

Fifteen patients underwent c-tube insertion; the first procedure was performed in June 1994. Two of the patients had a high imperforate anus anomaly; one child had cerebral palsy, and quadriplegia developed after an orthopedic operation. The rest of the children had spina bifida with involvement of anal sphincters. The mean age was 13.47 (standard deviation, 4.16). The range was 7 to 20 years.

Patients referred for percutaneous cecostomy have a rigorous preprocedure workup that includes a fluid diet for 2 days before admission. After admission, 25 to 40 mL/kg/h of a polyethylene glycol–sodium sulfate solution is given until clear. If the patient cannot drink the solution, it is given via a nasogastric tube at a rate of 20 to 30 mL/minute (1.2 to 1.8 L/h) until rectal drainage is clear, or until a maximum of 4 L is given.

The preparation also includes the application of a eutectic mixture of local anesthetic (EMLA) creams (Astra) to the right flank and lower quadrant. X-ray of the abdomen is performed an hour before the procedure to confirm the presence of an adequately prepared large bowel. In the diagnostic imaging department, the patient is placed on the C-arm interventional table. Ultrasonography is performed to identify the liver and spleen and to exclude any other masses or pathology. The antibiotics aminoglycoside (7.5/kg/d) and metronidazole (30 mg/kg/d) are administered intravenously. The procedure is performed under sedation, using intravenous diazepam (0.1 mg/kg) and meperidine hydrochloride (1 mg/kg), repeated as necessary. Several patients will have had augmentation cystoplasties, so the position and size of the bladder are assessed. Intravenous glucagon (0.5 mg) is given to induce bowel paralysis. A 22F silicone self-retaining catheter is introduced into the rectum, and the balloon is inflated with air. Air is pumped into the rectum, and the large bowel is inflated via the rectal tube until the cecum and proximal ascending colon are distended. The position of the cecum is assessed under fluoroscopy and is marked on the patient's abdomen.

Lidocaine (1%) is injected into the skin and soft tissues. A transperitoneal approach is used for this procedure. Access is obtained with a 19-gauge 7-cm single-wall puncture needle (Cook, Inc, Bloomington, IL) loaded with a gastric retention suture (Cook). Under fluoroscopic control, contrast is injected to confirm the position within the cecum. A .025-in guide wire is introduced into the needle to deploy the suture into the cecum. The needle is removed, and the suture is pulled tight to oppose the cecum snugly

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against the anterior abdominal wall. Over the initial .025-in wire, a 4F sheath and dilator are introduced. A second retention suture is inserted through the sheath and is advanced with an Amplatz super stiff .035-in wire (Cook). Two retention sutures are now holding the cecum up against the anterior abdominal wall. Over the wire, a 10F Coon's (Cook) fascial dilator is introduced to dilate the tract (Fig 1). A 10F 15-cm Cope catheter (Cook) with a retention loop is introduced and the catheter pulled up to oppose it against the anterior cecal wall (Fig 2). Contrast is injected to confirm the position in the cecum. The catheter is left to drain, and flushes with 10 mL of saline are injected twice daily. After the procedure, analgesia is given as needed. Intravenous antibiotics are continued for 48 hours.

RESULTS

There have been no significant complications. Minor irritation initially occurred in some patients at the site of the skin/tube junction. This was easily treated with silver nitrate cauterisation and topical antibiotics. Four patients required such cauterisation. Two patients experienced pain at the c-tube/skin junction for the first few days after the procedure, but this symptom cleared up spontaneously. Acetaminophen was all that was required to control this. One patient had a fever the day after insertion of the tube, coupled with generalized abdominal tenderness. Antibiotics were continued for 5 days on the assumption that there might have been a small "leak." Within 48 hours the patient had become asymptomatic. Ten of the 15 patients were kept in the hospital for 48 hours after insertion of the cecostomy tube. The remaining five were kept longer because they lived up to 400 km away. We were unable to needle the cecum in one 5-year-old patient because of an interposed huge sigmoid colon. No patient has required or requested removal of the c-tube. No c-tube has been removed inadvertently, nor has any tube required reinsertion. The c-tube method of colonic irrigation has been enthusiastically adopted by the patients and parents; all but one of them had had experience with the use of a special enema device for the administration of a leak-proof enema. All patients with a c-tube are at least as continent as they had been while using enemas, with or without the enema continence catheter. The main advantages over the retrograde enema are that "there is less mess," it is esthetically more appealing, and the entire procedure can be performed with a greater or complete degree of independence on the part of the patient.

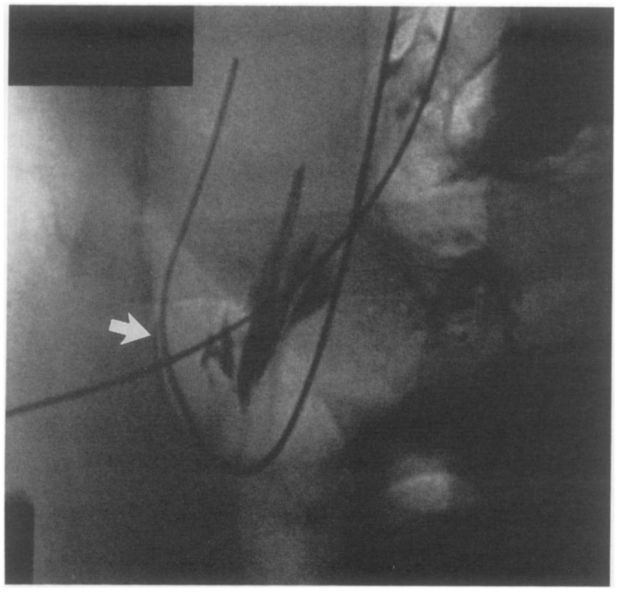

Fig 1. Dilator within the cecum. Note the metallic retention suture that anchors the cecum to the abdominal wall, and the contrast material in the lumen.

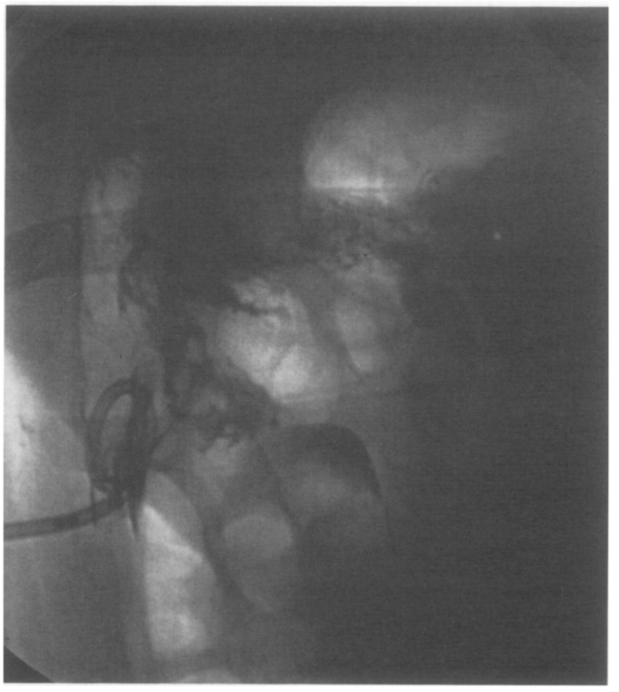

Fig 2. Self-retaining (pigtail) catheter within the lumen of the cecum.

DISCUSSION

Patients rarely initiate any discussion of the problem of fecal incontinence. It remains a taboo subject, despite the misery it causes. Progressive isolation and loss of individual potential ensue.[3] It has been estimated that at least 3 million people in the United States have this problem.[4] Over the age of 65 years, the prevalence is greater.[5] In psychogeriatric and geriatric wards, 56% and 32% of patients (respectively) are regularly incontinent of feces. Most forms of treatment have been unsatisfactory, esthetically unappealing, and/or difficult, in many cases, for the individual to administer without assistance. Forms of management that involve dietary adjustment are of

limited value for patients with sphincteric paralysis. Although in many cases the use of suppositories or small-volume phosphate enemas induces a bowel movement, this will not necessarily empty the colon of its entire contents. Thus, more feces from a more proximal part of the colon slide down to replace them within the rectum. Biofeedback had been hailed as an answer to this problem. Unfortunately, where muscular paralysis is complete and total, biofeedback has been found to be of little or no value.[6-8] Electrostimulation has been proposed in the management of incontinence, but the results have been disappointing.[9] It is only by emptying the whole colon of its entire contents that an incontinent patient can confidently anticipate the absence of unpredictable and embarrassing occurrences.

The use of large-volume enemas has revolutionised the management of fecal incontinence.[10,11] The unaided administration of enemas is difficult, especially if the individual has paresis or paralysis of limbs and/or trunk. In many cases, without assistance, such a manoeuvre is impossible. With this in mind, Malone et al[12] ingeniously devised an appendicostomy for the administration of antegrade enemas. Squire et al[2] found that it may not be necessary to reverse the appendix; instead, they recommend orthotopic appendicocecostomy coupled with some form of a cecal antireflux procedure. However, there have been problems with stenosis of the cutaneous opening and prolapse of the stoma. Griffiths and Malone,[13] in a recently published report on 21 patients, noted a complication rate of 81%; among the complications were stoma problems and the requirement for laparotomy on four occasions in three patients. Some stomas have been difficult to catheterise.[14] Kiely et al[15] described a procedure whereby a cecal flap conduit is fashioned for the purpose of antegrade enemas.

Percutaneous cecostomy has been used in the treatment of colonic pseudo-obstruction as well as for true colonic obstruction, enterocolitis, and Ogilvie syndrome.[16-21] The c-tube, inserted by nonsurgical means under local anesthesia, renders an operation unnecessary, because it has had the same degree of success as the other more invasive methods. The c-tube is of special value to the parents and caregivers of patients with truncal paresis because the administration of an enema under such circumstances would be a daunting feat. Thus, the numerous patients in chronic care facilities can have their bowels regulated with greater predictability and considerably less effort. The procedure may well be useful in selected cases of chronic constipation. The antegrade colonic enema already has been used successfully in such patients.[22]

We provide each patient with a no. 10 Foley catheter that is to be inserted into the opening in the abdominal wall, without delay, should the c-tube be inadvertently dislodged from the cecum. Based on experience with gastrostomies, we are concerned that the cecostomy opening may close rapidly after removal of the catheter. If a patient is dissatisfied with the c-tube, it can be extracted easily, and the orifice will heal, without the need for any other closure procedure. No patient has requested to have it removed.

Because the cecum has fecal contents, there may be a risk of infection associated with this new procedure. Therefore, it has been our policy to administer aminoglycoside and metronidazole (intravenously) for 48 hours after insertion of the c-tube. This is done to preclude the development of cellulitis of the abdominal wall.[23] Our current choice of antibiotic is based on the normal flora that may be anticipated within the cecum. It is quite conceivable that we are overtreating our patients, and that the entire event can be handled on an outpatient basis, using oral prophylactic antibiotics.

Currently, our technique requires the presence of a tube permanently taped to the abdominal wall. We are presently evaluating a "button," similar to that used in gastrostomy, which should be available soon.

Our concept of a percutaneously inserted cecostomy tube has been shown to be easily applied. It appears that the procedure has negligible complications and is preferable to the more invasive procedures.

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