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Treatment of fecal incontinence with a comprehensive bowel management program

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Colostomy

Abstract

Purpose: Many articles describe the antegrade continence enemas (ACEs), but few refer to a bowel management program. A successful ACE may not help a patient without such management. Valuable lessons were learned by implementation of bowel management in 495 fecally incontinent patients.

Methods: We previously reported 201 patients. Thereafter, another 294 patients participated in our program. On the basis of a contrast enema and symptoms, they were divided as follows: (*a*) 220 constipated patients and (*b*) 74 patients with tendency toward diarrhea. Colonic stool was monitored with abdominal radiographs, modifying the management according to the patient's response and radiologic findings. For constipated patients, the emphasis was on using large enemas. For patients with tendency toward diarrhea, we used small enemas, a constipating diet, loperamide, and pectin. Diagnoses included anorectal malformation (223), Hirschsprung's (36), spina bifida (12), and miscellaneous (23).

Results: The management was successful in 279 patients (95%)—higher in constipated patients (98%) and less successful in patients with tendency toward diarrhea (84%).

Conclusions: The key to a successful bowel management program rests in tailoring the type of enema, medication, and diet to the specific type of colon. The best way to determine the effect of an enema is with an abdominal film. The ACE procedures should be recommended only after successful bowel management.

Fecal incontinence is a devastating problem that affects about 25% of patients born with an anorectal malformation [1], some patients who have undergone an operation for the treatment of Hirschsprung's disease [2], patients who were born with pelvic tumors [3,4], spina bifida [5], sacral agenesis [6,7], and patients who have had severe pelvic trauma. Children and adults with fecal incontinence are often discriminated against and may not have an active and productive life [8].

Bowel management is an artificial way to keep patients who have fecal incontinence clean. It consists of finding, by trial and error, the type of enema (ingredients, concentration, and volume) that cleans the colon, to keep the patient clean, on a 24-hour basis, until he/she receives the next enema.

In the literature, we have found many articles referring to antegrade continence enema (ACE) procedures [9-12], yet

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Fig. 1 Contrast enema of a fecally incontinent patient with a tendency toward constipation, showing a dilated colon. Reprinted from Peña A, Levitt MA. Colonic inertia disorders in 'Pediatrics'. In Curr Probl Surg, Wells SA, ed. with permission from Mosby.

they do not mention any details of bowel management in those patients. We have become aware of many children who received an ACE procedure before having a successful bowel management regimen and, as a consequence, are still having accidents (dirty in the underwear).

The clinician must first be able to distinguish between true fecal incontinence and pseudoincontinence. Patients with true fecal incontinence are those who lack the ability to have voluntary bowel movements, either because they were born with a malformation with bad functional prognosis (bladder neck fistulas, cloaca with common channel >3 cm, large sacrococcygeal teratomas, tethered cord, sacral agenesis) or because in their previous operations they lost the integrity of the anal canal (Hirschsprung's disease) [2]. On the other hand, patients having pseudoincontinence usually were born with an anorectal malformation with a good functional prognosis, received a good operation, had severe poorly treated constipation, and behaved as if they were fecally incontinent. However, when they are disimpacted and have received the right dosage of laxatives to empty their colon, they have voluntary bowel movements and no longer soil their underwear.

Since our last publication [13], related to bowel management implemented in 201 fecally incontinent patients, we have treated an additional 294 patients. From this additional experience, we have learned new important facts, as well as new indications, and present those here.

1. Material and methods

We reviewed the medical records of 294 patients who participated in our bowel management program for the treatment of fecal incontinence. They were divided into 2 groups as follows: (*a*) patients with a tendency toward constipation and a dilated colon on hypaque contrast enema (Fig. 1) (220 patients) and (*b*) patients with a tendency toward diarrhea and a nondilated or short colon seen on the hypaque contrast enema (Fig. 2) (74 patients).

Fig. 2 Contrast enema of a fecally incontinent patient with a tendency toward diarrhea, showing a narrow colon and haustra in the pelvis because of the loss of the rectosigmoid in a previous operation. Reprinted from Levitt MA, Peña A. Treatment of chronic constipation and resection of the inert rectosigmoid. In Anorectal malformations in Children. Holschneider AM, Hutson JM, eds. with permission from Springer.

The treatment was implemented for a period of 1 week, seeing the patients every day; monitoring the amount of stool in the colon with daily abdominal radiographs; and modifying the content, concentration, and volume of the enema, according to the patient's response and radiologic findings.

Fig. 3 shows sequential abdominal x-ray films of a single patient. On day 1 (Fig. 3A), there is still contrast material from the contrast enema performed on the day before, a sign of a hypomotile colon. An enema with 500 mL of normal saline solution was prescribed. On the next day, the abdominal film (Fig. 3B) shows no contrast material, but there is a significant amount of stool in the rectum, and the mother reported that the child was still passing stool in the underwear in between enemas. A decision was made to add 20 mL of glycerin to the enema. Fig. 3C shows the abdominal film taken the next day with an almost completely clean colon and a report of a significant decrease in soiling episodes, but they were still present. One package of liquid soap (9 mL) was added to the enema. Fig. 3D shows a clean colon, and at that time, the mother reported a clean child.

The main ingredient of the enemas was normal saline (0.9%) and, whenever needed, glycerin (5-30 mL), soap (1-2 packets, 9-18 mL), and phosphate (C.B. Fleet Co Inc, Lynchburg, VA) (1/2 pediatric Fleet/24 h [30 mL] in patients <4 years old, 1 pediatric Fleet in patients >4 years old but <10 years old [60 mL], 1 adult Fleet/24 h [120 mL] in patients >10 years old) were added to the solution, in this order (from least to most irritating).

For the group with tendency toward constipation, the treatment included large enemas (500-1000 mL saline) with added glycerin and (or) soap, and (or) phosphate. For the group with tendency toward diarrhea, small normal saline enemas were prescribed (200-450 mL), plus a constipating diet, pectin, and loperamide.

The bowel management was considered successful when the patient's underwear remained totally clean for 24 hours. The whole process of enema administration and emptying the colon should take no longer than 1 hour. The patient should receive the enema in about 15 minutes, hold the enema for 10 minutes, then sit on the toilet for 45 minutes.

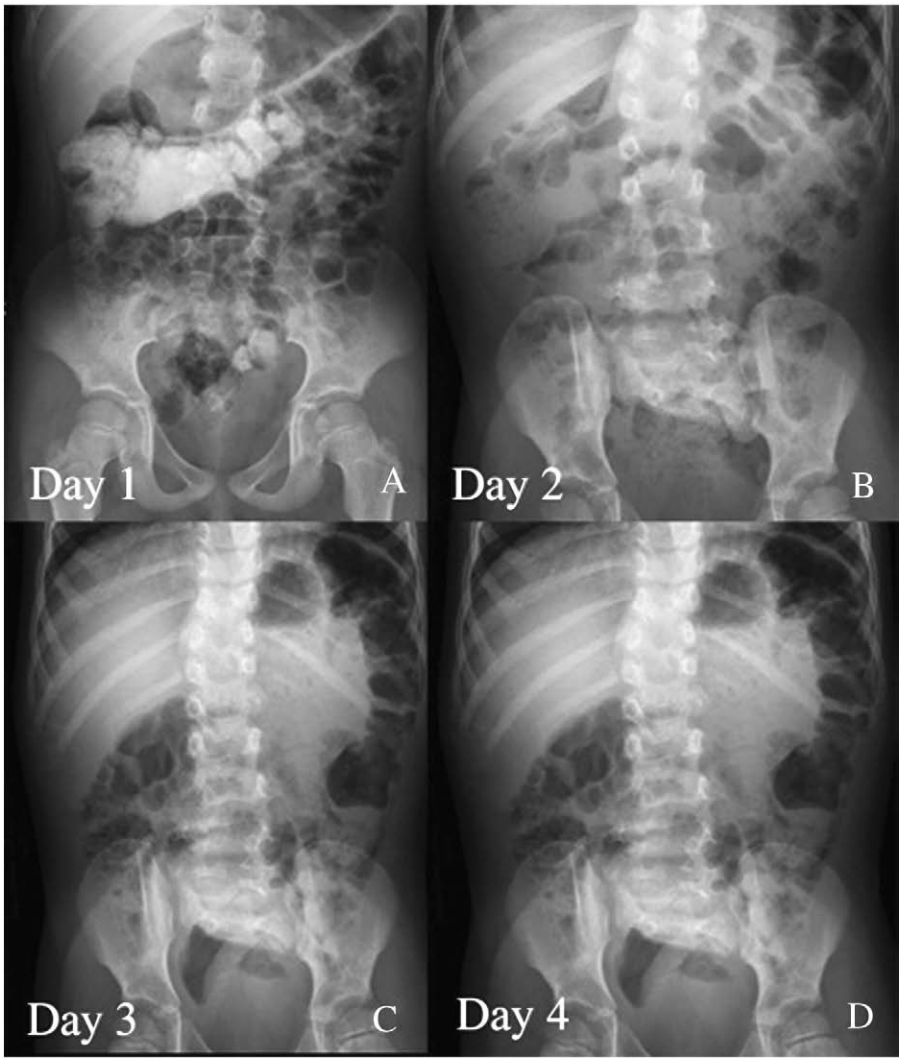

Fig. 3 Daily abdominal radiographs to monitor the amount of stool in the colon and the cleaning effect of the prescribed enema.

Table 1 Diagnoses of patients with fecal incontinence

Diagnosis	Hypomotile	Hypermotile	Total
Anorectal malformation	177	46	223
Hirschsprung's	9	27	36
Spina bifida	12	0	12
Sacrococcygeal teratoma	6	0	6
Trauma	2	0	2
Others [a, b]	14 [a]	1 [b]	15
Total	220	74	294

[a] Sacral agenesis = 4, spinal stenosis = 1, spina bifida with prostatic fistula = 1, spina bifida with anorectal malformation without fistula = 1, unknown anorectal malformation with Hirschsprung's = 1, congenital short colon = 1, idiopathic fecal incontinence = 1, Hirschsprung's with perineal fistula = 1, unknown = 3.

[b] Spina bifida with omphalocele.

Patients' diagnoses included anorectal malformation (223), Hirschsprung's disease (36), spina bifida (12), and miscellaneous causes (23) (Table 1). Six patients had an ACE type of procedure already performed at other institutions, without a successful bowel management regimen, and were still having accidents. In 13 patients we performed bowel management through what they were told was a "permanent" colostomy (Fig. 4) created in another institution in patients with a poor functional prognosis type of malformation. We offer the bowel management to these patients, to determine the future possibility of a colostomy closure or pull-through.

Fig. 4 Bowel management through the stoma.

Table 2 Comparison of results between our previous published series [13] and the current one

Fecally incontinent patients	Previous series [13]		Current series	
	Patients	Success Rate	Patients	Success Rate
Tendency toward constipation	44	93%	220	98%
Tendency toward diarrhea	128	88%	74	84%

Sixteen patients, not included in the 294 patients, received bowel management for the treatment of severe, otherwise, intractable, diaper rash.

We obtained institutional review board approval (2008-0867) for this study.

2. Results

The management was successful in 279 patients (95%). We improved our overall success rate when comparing this series with our previous publication [13] (95% vs 88.9%; $P = .0173$)

Fig. 5 Contrast enema of a patient having colitis after long use of phosphate enema.

(Table 2). Follow-up ranged from 6 months to 3 years. Age range for initiation of bowel management was 3 to 31 years.

In this study, the success rate was higher in patients with tendency toward constipation (217 [98%]) than in patients with tendency toward diarrhea (62 [84%]). Fifteen patients (5%) did not improve. The failure was more frequent in the group with tendency toward diarrhea (12 patients, 80%), and only 3 of them (20%) belonged to the group with tendency toward constipation. The 2 most frequent causes of bowel management failure were the inability to form solid stool and noncompliance because of social, behavioral, or economic reasons.

Five patients who were treated with long-term phosphate enemas (Fleet) developed symptoms of colitis (Fig. 5). The colitis resolved several weeks after discontinuing the administration of phosphate.

Of the 13 patients who received bowel management through the colostomy, 9 had an empty bag for 24 hours (successful), and so far, 7 of them have had a pull-through, followed by the continuation of enemas either through an ACE or through the rectum.

The bowel management proved to be very successful in all cases with diaper rash, as it made it disappear in about 48 hours.

3. Discussion

We believe that the improvement in our overall success rate is a reflection of our increased experience. We were less successful in cases with tendency toward diarrhea, and we feel that this was because more complicated patients are now being referred to our bowel management program. Our recommended time to start bowel management is when the child would normally begin wearing normal underwear (age 3-5 years). Of course, we met many patients after that ideal age at the time of their referral to our center.

It is very clear that a short or hyperactive colon represents a serious problem for patients with fecal incontinence because bowel management is more difficult to implement and is less successful in that group of patients. Therefore, we want to emphasize that for patients with anorectal malformations (ARM) the surgeon must preserve as much colon as possible, particularly in those with a bad functional prognosis type of anomaly. Preserving colon allows for more water absorption capacity and therefore more likelihood to form solid stool. In addition, the characteristic slow transit of the large bowel (as compared with small bowel) is vital for a successful bowel management.

We confirmed our previous belief that the key to a successful bowel management is in the differentiation between fecally incontinent patients having constipation and those having tendency toward diarrhea because their management is different [13].

It was an unexpected observation to find that some patients who were receiving phosphate enemas developed a severe spastic colitis, manifested by tendency toward diarrhea, bloody stools, cramps, and a spastic narrow colon on contrast enema (Fig. 5), in patients who were previously catalogued as having tendency toward constipation. These patients were having successful bowel management and suddenly started having "accidents" (passing stool in the underwear), and the abdominal radiograph consistently showed an empty colon. This, as far as we know, has not been previously reported as a complication of phosphate enemas. We were aware of the electrolyte disturbance that high concentrations of phosphate enemas can cause [14,15] but could not find mention of an induced colitis. Because of this experience, we have now been trying to avoid the use of phosphate, reserving it as a last resort, after glycerin (10-30 mL) and liquid soap (1-2 packages, 9-18 mL) have already been used, for patients who need a highly concentrated enema to clean the colon.

Another significant modality introduced in our program was the use of normal saline solution (from the pharmacy) as the main component of the enema rather than homemade water/salt solutions. We do this as a safety measure, after having a scary experience with 2 patients in our early series that had to be admitted to a hospital on an emergency basis because of severe hypernatremia, caused by an inaccurate home preparation of the water/salt solution.

An interesting group of patients is the one that received bowel management through the colostomy. This new indication originated from the evaluation of patients who came to us with a colostomy that was considered "permanent." The parents requested a reevaluation, hoping that we would consider a pull-through or colostomy closure. Most of these patients were born with a malformation with very poor functional prognosis. Others had a short colon, either congenital (cloacal exstrophy) or acquired [16]. Their short colon had a questionable capacity to absorb water, and we were hesitant to perform a pull-through procedure that would result in a perineal stoma, worsening the patient's quality of life. It was then that we decided to implement the concept of "bowel management through the stoma" (Fig. 4). If the management was successful (empty stoma bag for 24 hours), then a pull-through or colostomy closure could be considered. At that time, the patient and (or) parents would know the kind of effort needed to stay clean. Interestingly, some patients had successful bowel management through the stoma but wanted to remain with their colostomy. They rather decided to continue the management (enemas through the stoma) because they were able to have an empty bag for 24 hours. An empty bag to them represented a great improvement in their quality of life because, for example, it allowed them to play sports without the risk of stool leakage from a full stoma bag.

Infants, who recently had a colostomy closed, often have severe diaper rash, which is difficult to treat. These patients may frequently pass stools, which is a characteristic manifestation of their abnormal colonic motility. A small enema (150-300 mL), mainly with saline solution, prevented them from passing stool constantly and gave them

several hours of dryness. With this, the diaper rash disappeared within 48 to 72 hours. We only administered enemas for this kind of patient 1 month after the colostomy was closed.

Antegrade enema operations should be recommended only after proving that bowel management has been successful. We do recognize that for certain patients an ACE will improve compliance and can precede the implementation of the enema regimen in rare circumstances. It is only a different route for the enema—the key to success lies in the enema formula not the route. For some children (such as those with spina bifida in wheelchairs), the ACE is much more practical than the rectal enema.

4. Conclusions

We believe that the key to a successful bowel management program resides in tailoring the type of enema, medication, and diet according to the characteristics of each patient as to tendency toward constipation or tendency toward diarrhea. The best way to determine the cleaning effect of an enema is with an abdominal film (Fig. 3). Patients who received a "colostomy for life" can be adequately evaluated for the possibility of a pull-through or a colostomy closure by performing bowel management through the stoma. Severe intractable diaper rash can be treated with bowel management. We firmly believe that patients should be in normal underwear at the time that their friends are in normal underwear, so that there is no social implication of their soiling. This can be achieved with a successful bowel management program.

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Discussion

Dr Al Chahine (Washington, DC): I have a question. When you categorized them it mentions here in the abstract that you just used the symptoms and the barium enema to determine whether they have hypermotility or the hypomotility.

Andrea Bischoff, MD: That is correct.

Dr Chahine: Is that all you used?

Dr Bischoff: That is correct. That is all we used.

Dr Dan Robie (Jacksonville, Fla): Dr Peña mentioned the other day that a small percentage of, I believe, those megacolon patients would go on to surgery for resection of that megarectum and those were chosen based on poor response, or inadequate response, to medical therapy, which I think you just outlined. Do you also do biofeedback and [electromyography] EMG training on these patients? I did that where we were previously, used both external and internal probes to try to educate the children as they got older. It was probably more successful on proper pelvic relaxation techniques and so forth. I can't say we had this long string of successes but I just wonder if you utilized that and if you found it successful at all?

Dr Bischoff: I'm not sure if I understand the first part of the question about resection. We do that for constipated patients but with potential for continence. The patients in this study are fecal incontinence patients so those they don't need surgery for resection of colon. And the second part of the question about biofeedback. Dr Peña and Dr Levitt worked with that before, and they saw that there was an improvement

in the monitor, in the numbers, but that was not reflected in real life. They could improve the numbers but they would not improve their fecal incontinence.

Dr Robie: I understand. Thank you. But the first part of that you said that these are incontinent patients. You showed us a contrast enema that showed a hugely impacted rectum that I assume the incontinence, therefore, was leaking around this impacted stool, which has been what I have seen in the past, as well. So is that also, then, the group, a small percentage of which go on to that resection?

Dr Bischoff: No. There is a group of patients that come to us with what we call pseudoincontinence, who are the patients that are leaking, and after we disimpact them and we treat them with adequate amount of laxative, they are continent. This is not the type of patients that we are talking about right now, who are born with a poor malformation, a bad prognosis malformation, poor sacrum. They are fecally incontinent. It is kind of hard to understand, but in patients with fecal incontinence, we have 2 groups—a group with a tendency to constipation and a group with a tendency to diarrhea, but they are all fecally incontinent.

Dr Robie: Okay. Thank you.

Dr Mary Brandt (Houston, Tex): This may be more philosophical or just some of Dr Pena's wisdom but in instituting these bowel programs the biggest issue that I have with the families is really the psychological issue of the enemas. And I am always telling my patients they have to know the difference between their friends and their enemas. And it is very hard, in some families, where it becomes a battle between the parents and the child to institute this kind of bowel program and I wondered if you had any advice or how you approach the difficult family in instituting this?

Dr Bischoff: For the patients that failed bowel management, one of the reasons was noncompliance. And we take advantage of the patient wanting to be clean. That is something that, because the family is tired of doing enemas because they tried it in another institution and we have to convince them that now this time it will work. So usually it is just conversation. It is just showing that the enema doesn't hurt. It is teaching them the right technique and what we see is that on the first Friday that we see them it is a shy child, a child that is not cooperative, and then 1 week after it is a completely different child, happy, and then, if they see the benefit of being clean, they are cooperative and they are willing to do it. That is all I can say.