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A practical approach to the management of pediatric fecal incontinence

Andrea Bischoff, MD,[a] Manuel Tovilla, MD[b]

From the [a]Hospital Regional da Asa Sul, Brasilia, Brazil; and the [b]Hospital Infantil de México Federico Gómez, Cuidad de Mexico, Mexico.

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We describe the rationale and key aspects for success of a bowel management program for the treatment of pediatric fecal incontinence. A retrospective review was done of the medical strategies used for the treatment of over a 1000 patients with fecal incontinent, combining the experience of the authors' previously published reports (Peña A, Guardino K, Tovilla JM, et al. J Pediatr Surg 1998; 33:133-137 and Bischoff A, Levitt MA, Bauer C, et al. J Pediatr Surg 2009; 44:1278-1284) and additional treated patients after those publications. Emphasis was placed on the review of the key factors needed to achieve success. Through the years, we have learned important lessons that resulted in our current strategy which allows us to obtain better results than earlier in our series. At present, the key aspects for success are (a) to distinguish between true fecal incontinence and pseudoincontinence; (b) to determine the characteristics of the colon (dilated or nondilated), ascertained by looking at the patient's contrast enema, and determine the treatment strategy from this; (c) to monitor the result of the enema (amount of stool left in the colon) with daily abdominal radiographs during a 1-week period; and (d) to thereby modify the type of enema daily, depending on the clinical result, and the abdominal radiograph. Following a systematic rationale in the classification of patients with fecal incontinence and applying selectively, individualized management, it is possible to achieve a 95% success rate in patients suffering from fecal incontinence.
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Fecal incontinence is a devastating problem affecting millions of children and adults around the world. In children, the main causes of fecal incontinence are anorectal malformations with bad functional prognosis,[1] sacrococcygeal teratomas,[2,3] damaged anal canal after an operation for Hirschsprung's disease,[4,5] spina bifida,[6] and sacral agenesis.[7,8] The medical management of fecal incontinence as described here is a simple and effective way to keep these children clean, allowing them to be socially accepted, and to engage in regular activities, without the embarrassment and distress of having fecal "accidents."

Address reprint requests and correspondence: Andrea Bischoff, MD, 3333 Burnet Avenue, Cincinnati, OH 45229, USA.
E-mail: Andrea.bischoff@cchmc.org.

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Methods

We retrospectively reviewed the experience acquired during the last 3 decades of trying to improve the quality of life of patients suffering from fecal incontinence. Overall, more than 1000 patients were included, combining experience of the previous publications from the authors' Centers[9,10] and the additional patients treated after them (201 patients,[9] 294 patients,[10] 110 patients treated at Cincinnati Children's Hospital, and 400 patients treated at Hospital Infantil de Mexico Federico Gomez, Mexico City, Mexico). Emphasis was placed on the rationale behind the treatment implemented for those patients, with the goal to obtain a successful bowel management, by which we mean that a child that is completely and consistently clean in his/her underwear.

Results

Early in our experience, we started using enemas in all patients, without a specific rationale. The results obtained were variable. Through the years, by trial and error, we have learned important lessons that resulted in our current strategy.

The key components of our current strategy include the following points:

1. **Distinguish between pseudoincontinence and true fecal incontinence**

   A significant number of patients who appear to suffer from fecal incontinence in reality have what we call "overflow pseudoincontinence." The importance of differentiating between these 2 conditions cannot be overemphasized, mainly because the management of both conditions is radically different, and because the results of the management of the pseudoincontinent patients are spectacularly good.

   Overflow pseudoincontinence must be suspected in a child born with an anorectal malformation that has good prognosis for bowel control (perineal fistula, vestibular fistula, rectourethral bulbar fistula, imperforate anus without fistula, and cloacal malformation with a common channel of <3 cm in length) and a normal sacrum.[11] In addition, it is clear that the patient received a technically good operation to repair their malformation. Those children, due to their original diagnosis, have a tendency to suffer from constipation. It is unfortunately very common that their constipation is not properly treated. They accumulate large amounts of stool in their colon, which dilates over time, and they soil. When this is the diagnosis, these patients do not need enemas. They need the clinician to first clean the patient's colon, and then determine the correct amount of laxative that empties their colon daily, radiologically proven, and after that the soiling disappears. The patient and parents should be aware that the amount of laxative, determined by trial and error, is the amount required to empty the child's colon; therefore, it should not be stopped or tapered, otherwise, the patient will become impacted again. Our preference is to use a Senna-based stimulatory laxative. We avoid stool softeners in these patients as those tend only to soften the stool and not help it come out. Stool softeners usually make the patient worse, with leakage of watery stool in a colon filled with stool that never completely empties. When the patient comes to us they often have fecal impaction. Before determining the dose of laxatives, it is mandatory to disimpact them. We do this with 3 enemas daily (1 with saline solution only, 1 with saline and phosphate, and the last with saline and glycerin). After the patient is completely disimpacted (radiologically proven) the laxative requirement can be determined. The Senna-based laxative is given, and whenever needed, pectin is added, which gives the stool a little bulk, as laxatives tend to form liquid stool that are harder to control.

   A child with true fecal incontinence is the one that has no potential for bowel control, either because they were born with an anorectal malformation that carries a poor prognosis in terms of bowel control (cloaca with common channel >3 cm, rectobladder neck fistula),[11] absent sacrum,[7,8] spina bifida,[6] large sacrococcygeal teratomas,[2,3] or when during Hirschsprung's operation the anal canal was destroyed (usually because the pectinate line was not preserved during the dissection).[4,5] Such patients will benefit from a bowel management program, receiving daily enemas. They need a mechanical way to empty their colon. Laxatives are contraindicated in those cases as they only worsen the incontinence.

2. **Identify the type of colon (nondilated or dilated) to individualize the type of enema**

   This step is facilitated by obtaining a contrast enema done with hydrosoluble material and without bowel preparation. The study may show 2 characteristic images: (a) a nondilated colon (Figure 1); or (b) a dilated colon (Figure 2). Based on this image, we estimate the volume and content of the initial enema for each incontinent child who needs the mechanical cleansing of an enema to stay clean.

   a. **Nondilated colon**

      Children with a nondilated colon (Figure 1) on the contrast enema tend to have a colon that moves very fast. Those patients benefit from a small normal saline enema (100-300 mL), but they also need a constipating diet, loperamide (to prevent their colon from moving between the enemas), and pectin (a fiber that has no laxative effect, but serves as a stool bulking agent).

   b. **Dilated colon on the contrast enema**

      When a dilated colon is found on the contrast enema (Figure 2) it reflects a colon that tends to move slowly. Because of the size of the colon the enema has to be

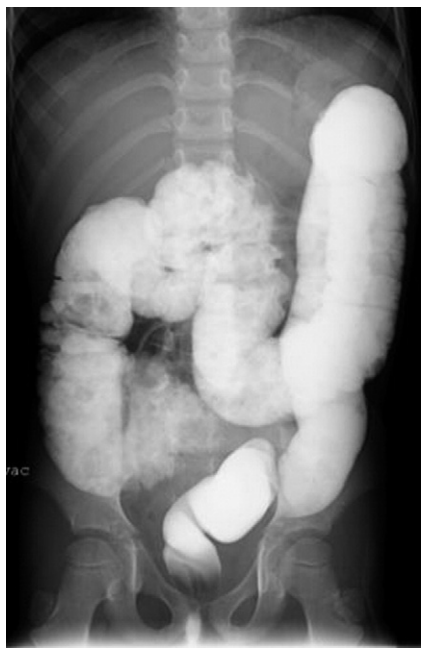

Figure 1 Nondilated colon.

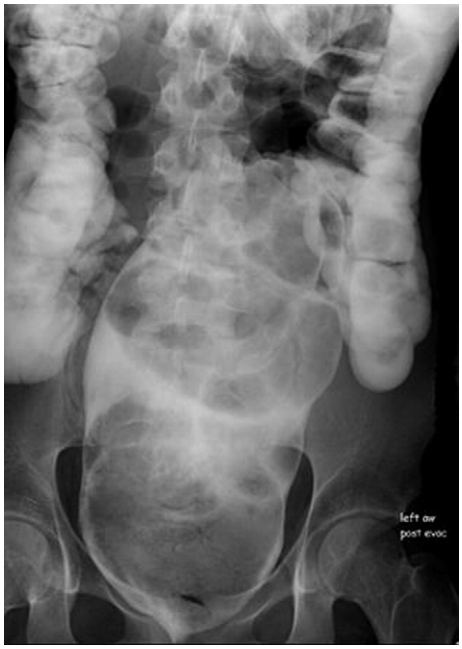

Figure 2 Dilated colon.

large (400-1000 mL saline) and concentrated enough to clean it properly. Our preference is to start with normal saline (0.9%) and to add 5-30 mL glycerin, soap (1-2 packages, 9-18 mL), and/or phosphate (Fleet) (33-mL fleet for 24 hours in patients aged <4 years, 66-mL fleet in patients aged >4 years but <10 years, 133-mL fleet for 24 hours in patients aged >10 years) to the solution, in this order. In this group of patients, the challenge is to mechanically clean the colon properly with an enema. No special diet is needed and no laxatives should be given.

3. **Radiologic monitoring of the amount and location of stool in the colon to determine the effect of the enema**

   After years of speculation, trying to determine the effect of the enemas we were giving, we have learned that the only way to objectively measure the enema's effectiveness is by analyzing the abdominal film to see how much stool is present in the rectosigmoid and left colon.

   This is the most important step, as we have learned that the parent's reports frequently do not correlate with the radiological finding. We do not worry about stool in the right colon as the enema only needs to clean the left colon, which is the stool that accumulates in the 24 hours between enemas.

4. **Daily modification of the volume and content of the enema, depending on the radiologic finding and clinical result**

   This is done daily, by trial and error, over a period of 1 week and based on clinical results and the patient's abdominal film (Figure 3). Every day parents report to our nurses about the patient's acceptance of the enema, secondary effects (pain, vomiting, palor, lethargy), whether or not the patient had stool in the underwear, and the amount and time that it happened. Based on that information and the abdominal film, daily modifications of the enema are made until we are successful. Our goal is to find the enema that is well tolerated by the patient that cleans at least the entire rectum, sigmoid, and left colon and keeps the patient completely clean for a 24-hour period, until he/she receives the next enema. In general, the volume and concentration of the enemas are changed following these principles:

   - Increase volume and/or concentration when the patient's underwear is not clean and the abdominal film shows a significant amount of stool in the left colon;
   - increase concentration of the enema when the fluid of the enema remains for more than 1 hour without provoking a bowel movement and it does not clean the colon well;
   - decrease concentration of the enema when the patient experiences pain, nausea, or vomiting during the administration of the enema;
   - decrease volume of saline solution when the abdominal film is clean and the patient is having an accident shortly after the enema and the accident is reported as clear liquid;
   - decrease the volume and increase concentration when the parents report that the child cannot handle the amount of volume prescribed; and
   - add a strict constipating diet and administration of loperamide if the patient keeps passing liquid stool in between enemas and the x-ray film shows a clean colon.

   The technique for giving the enema is also very important. We try to take advantage of gravity with the child's position (Figure 4). The solution is administered in about 5 minutes and children are instructed to hold the enemas for 10 minutes, then to sit on the toilet for 45 minutes. The enema is given through a Foley catheter and, whenever needed, the balloon is inflated to serve as a seal (Figure 5).

   After the successful week, if any time a child that was doing well has an accident; the parents are instructed to obtain an abdominal film so we can evaluate what is going wrong. Some patients stay with the same enema for long periods while others require periodic modifications.

   Following these rules, we have achieved a 95% overall success.[10] The reasons for failure that we have observed include incapacity to form solid stool and noncompliance.

Discussion

We believe that one of the reasons why bowel management is not done in all institutions the way we have described

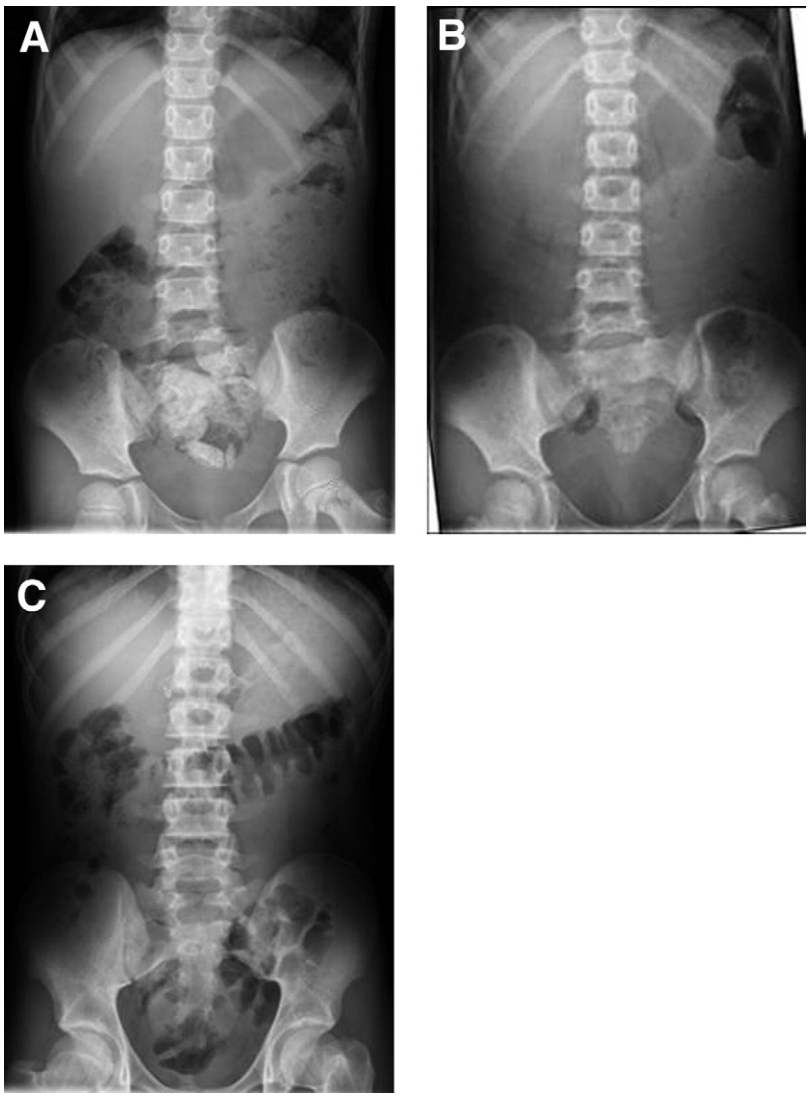

Figure 3 Daily abdominal radiographs to monitor the amount of stool in the colon and the cleaning effect of the prescribed enema. (A) First day after the enema. The patient was still soiling. The abdominal x-ray film shows a significant amount of stool in descending and sigmoid colon. Decision: increase volume and concentration of enema. (B) The following day, patient is still soiling. X-ray shows significant reduction in the amount of stool, but there is still some stool in the descending colon. Decision: increase the volume of the enema. (C) The following day. Patient is with clean underwear for 24 hours. X-ray shows a completely clean colon.

here is because it is a very time-consuming process and requires a supportive infrastructure, including radiology and nursing. But, we truly believe that this is a reproducible method that can dramatically change the quality of life of children suffering from fecal incontinence.

In some patients we cannot clearly determine initially whether they belong to the pseudoincontinence or to the true fecal incontinence group. The reason for this is that the severity of fecal incontinence also follows a spectrum, and for those in the middle of the spectrum it is hard to predict how they are going to behave. Usually because those patients are used to being dirty in their underwear, we first offer bowel management with enemas, on a temporary basis, so they can learn how it feels to be clean. Then, at a vacation time we encourage the family to come again for an entire week to try to stop the enemas, closely monitoring the patient again with daily abdominal x-ray films. Some of those patients do manage to stop the enemas and are successful in having laxatives to empty their colon with control. Others just need a special diet and pectin.

For patients who come to us with a "permanent colostomy" due to a bad prognosis type of malformation, we teach them or their parents bowel management through the colostomy.[10] If they are successful (clean stoma bag for 24 hours) we can offer them a pull-through or closure of their colostomy knowing that the patient will be clean with enemas. This situation is of great value for patients with cloacal exstrophy who have a short piece of colon and we are not sure whether they will be able to form solid stool,[12] which is a requirement for successful bowel management. But once we are able to manage them with bowel management

through the stoma we can confidently do a pull-through, and expect them postoperatively to be clean.

Because we have learned that bowel management is an effective way to keep children clean in their underwear we do not believe in a "colostomy for life" in children with an anorectal malformation and bad prognosis for bowel control, unless it is a conscious decision of the family or the patient, or unless the patient's colon is incapable of forming solid stool.

Our 5% rate of failure represents noncompliance because of social, behavioral, or economic reasons; or incapacity to form solid stool in patients with a short colon due to cloacal exstrophy or previous extensive colon resections. In such cases we encourage the patients to try the bowel management program through the stoma each year, as those pieces or pouches of colon tend to grow over time and improve their capacity to absorb water, making the stool more solid.

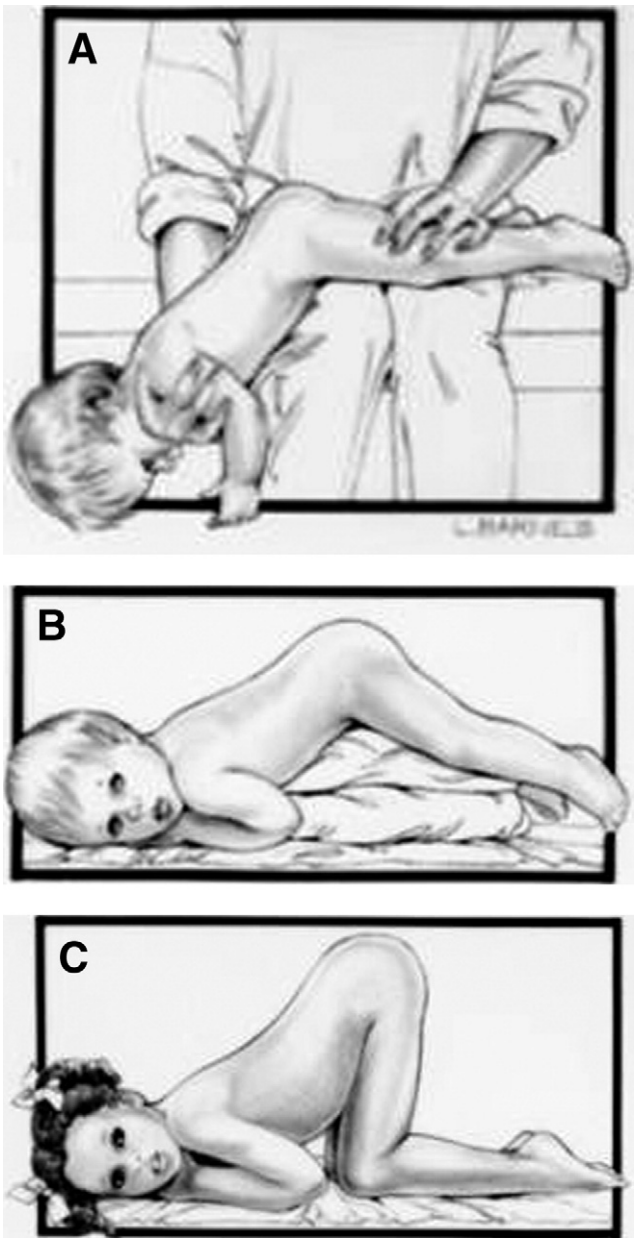

Figure 4 Children's position for enema administration, according to age. (Reprinted from Peña A, Levitt MA. Pediatric Surgical Problems, In: Colon and Rectal Surgery, edition 5, with permission from Lippincott, Williams, and Wilkins.)

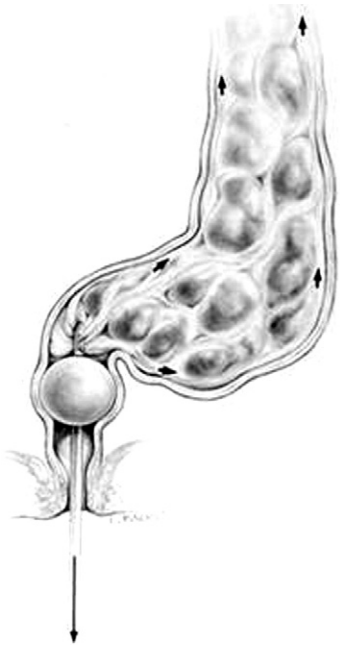

Figure 5 Inflated Foley balloon, which acts as a seal. (Reprinted with permission.[9])

The bowel management program should be started in all patients who suffer from fecal incontinence at age 3-4 years, as this is the time when most children are toilet trained.

Once we demonstrate that the bowel management is successful we offer our patients an antegrade continence enema procedure,[13,14] particularly when we know that the bowel management will most likely be required for life. We explain to the patient that this is only a different way to administer the enema. We strongly encourage the patient to be engaged in this decision; therefore, we tend to operate on them at the time that the patient can participate in the discussion. In our Center, an antegrade continence enema procedure is only offered after a proven successful bowel management program done either through the anus or through the stoma.

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