



Do we need Colonic Manometry to Diagnose Functional Fecal Retention?

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International Foundation for Gastrointestinal Disorders (www.iffgd.org)

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Most people feel that a daily stool is a sign of good health at any age. Some people pay close attention to the frequency, size, and consistency of their children’s stools. Any deviation from the expected norm is a source of concern and leads to a call or visit to the doctor’s office. About 3% of visits to the pediatrician’s office, and 25% of pediatric gastroenterology specialist visits, are for constipation.

Constipation can be defined by reduced stool frequency, hard stools, very large stools, or difficulty passing stool. Normal stool frequency depends on age. An infant averages 4 stools per day in the first weeks of life, and the stool frequency declines to 2 stools per day after 4 months. A functional cause is most common. Only a minority of children have constipation due to abnormal anatomy, abnormal physiology, toxins, or metabolic disorders.

Anatomic causes of constipation (e.g. congenital or acquired anal/colonic narrowing or obstructions) include disorders such as imperforate anus (absence of the anal opening). Examples of physiological causes include Hirschsprung’s disease and chronic intestinal pseudo-obstruction. Metabolic causes include hypothyroidism (under active thyroid), hypo- or hypercalcemia (very low or very high calcium levels in the blood), and diabetes mellitus (Type I or insulin dependent diabetes in children). Toxic causes include lead toxicity and medications such as opiates (e.g., morphine, codeine), vinca alkaloids (chemotherapy agents to treat patients with malignancies), and anticholinergics (antispasmodics).

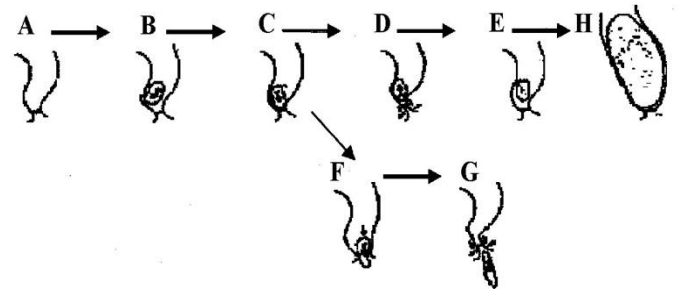
Functional Fecal Retention

Functional fecal retention is the most common cause of childhood constipation. It is most often due to frightening or painful defecation experiences, which result in voluntary avoidance of passing stools. Children with functional fecal retention respond to an urge to defecate by contracting their anal sphincter and squeezing the buttocks together (gluteal muscles) causing retention of feces. Repeated retention of feces causes an increase in size of stools leading to more

painful defecation experiences and further attempts to avoid defecation. (Table 1)

The diagnostic criteria (symptom-based, *Rome II*) for functional fecal retention is defined in a person from infancy to 16 years of age by a history of at least 12 weeks of: 1) Passing large diameter stools at intervals less than 2 per week, and 2) Retentive posturing, avoiding defecation by purposefully contracting the pelvic floor. As pelvic floor muscles fatigue, the child uses the gluteal muscles, squeezing the buttocks together. Accompanying symptoms include soiling of the underclothes, irritability, abdominal cramps, and decreased appetite. These symptoms disappear immediately after passage of a large bowel movement.

Table 1



- A The rectum is empty. There is no urge to defecate.
- B Stool enters the rectum causing a sensation of fullness.
- C Reflex relaxation of internal anal sphincter, stool descends into anal canal; awareness that stool passage is imminent.
- D Pelvic floor muscles contract to maintain continence, moving the stool upward and out of the anal canal.
- E If stool remains in the rectum after the pelvic floor returns to its resting state, stool will no longer be in contact with the anus. Rectal wall relaxes reducing pressure and wall tension, and urge to defecate abates.
- F Defecation occurs when pelvic floor relaxes; pressure in rectum is greater than pressure from external anal sphincter and the pelvic floor. Stool moves from the region of higher pressure to the area of lower pressure.

Increase in intra-abdominal pressure propels stool through the anus.

- G Pelvic floor contracts again when stool is no longer in contact with the anus; remaining stool forced out.
- H If a child repeatedly responds to the urge by withholding (C and D), a fecal mass accumulates. Over time the fecal mass becomes too large and too firm to be extruded without painful stretching of the anus. The mass is too bulky to be shifted out of contact with the anoderm. As pelvic floor muscles fatigue, the anus becomes less competent and retentive fecal soiling with soft or liquid stool occurs. The child resorts to retentive posturing, attempting to preserve continence by vigorous contraction of the gluteal muscles.

—By: Paul E. Hyman, M.D.

A detailed history and thorough physical examination can differentiate functional fecal retention from disease in most cases. If the child meets the symptom-based criteria for functional fecal retention, no further workup is necessary.

Differentiating Functional Fecal Retention from Disease*

Feature	Fecal Retention	Disease
Starts at Birth	Rare	Common
Fecal Soiling	Common	Rare
Fecal Mass Above Rectum	No	Common
Retentive Posturing (holding back)	Common	Rare
Passage of Very Large Stools	Common	Rare
Painful Bowel Movements	Common	Rare

*This differentiation is not intended to replace the appropriate diagnosis and treatment of your child by a qualified pediatric doctor.

Treatment

Treatment goals are to educate the child and family about the problem, to use medication to assure painless defecation, and to provide continuing availability for guidance and effective reassurance.

Medication helps to make the stools soft and take away the painful experiences. It takes repeated painless bowel movements before the patient loses the fear of defecation. As directed by a physician, non-stimulant softeners such as mineral oil, milk of magnesia, lactulose, and polyethylene glycol are appropriate for softening the bowel movements. The choice of medication depends on the ease of administering the medication to the child. The dose of

medication needs to be adjusted to produce soft, narrower stools. By softening the stools, the child will experience painless defecation. Over time the fear resolves and the child learns to relax the pelvic floor. The fear of a painful bowel movement may last several months despite having soft stools. Also, relapses are common. It is important for parents to be consistent with giving daily medications because just one painful bowel movement may trigger a return to withholding.

Other interventions may benefit the patient, including: 1) A small reward for sitting on the toilet, or for informing the parents when they have the urge or a successful bowel movement. 2) Anorectal biofeedback for children who request it. 3) A brief trial of stimulant laxatives, to help train patients to recognize and respond to the urge to defecate. 4) Collaboration with a mental health professional when there are multiple behavioral problems or family problems.

When a child fails therapy, the family worries that something is being missed. Treatment failure can be due to non-compliance to the medication, chaotic family life, or the child's unwillingness to commit to a therapeutic alliance with his or her physician. Families sometimes either fail to notice or forget about the passage of large and painful bowel

movements, withholding behavior, and the failure to administer and adjust the medications. Blaming the clinician and changing doctors leads to further workups, barium enemas, rectal biopsies, anorectal manometry, and transit studies with no conclusive explanation for the patient's persistent constipation problems.

Colonic Manometry

Colonic manometry may be the "last stop" for patients to distinguish colonic health from disease. After a day of laxatives to empty the colon, colonoscopy facilitates placement of a plastic catheter with 8 recording sites spanning the colon. A colonic manometry study usually lasts about 3 hours. There are three features to normal colon manometry: 1) An increase in colon contractions after a meal. 2) High amplitude propagating contractions (HAPC), which are colonic contractions that move fecal material through the colon to the rectum, causing rectal distention and the urge to defecate. 3) No discrete abnormalities.

In a study to assess if clinical features differentiated functional fecal retention from colonic neuromuscular disorders, we reviewed data from 34 consecutive children referred for colonic manometry because of persistent constipation undiagnosed and/or unresponsive to medical management. This data was published as an abstract in *Gastroenterology* 116:A4369, 1999.

In the study, colonic manometry was normal in 13 patients with functional fecal retention (FFR). Colonic

manometry was abnormal in 8 patients with chronic intestinal pseudo-obstruction, and in 12 of 13 with Hirschsprung's disease and persistent symptoms following surgery. The children with FFR were more likely than others to report bloating, abdominal pain, and constipation, but there was overlap with other groups. The children with Hirschsprung's disease were less likely than those with FFR and chronic intestinal pseudo-obstruction to somatize [describe physical aches and pains], but there was an overlap. One child with chronic intestinal pseudo-obstruction and 8 with Hirschsprung's disease had retentive behavior, and parents of 7 children with FFR denied retentive behavior until it was demonstrated during the test session. Parents of 5 children with FFR denied their child passed enormous stools, but admitted that they regularly intervened with laxatives and enemas early in the course. Parents attending the test sessions accepted the results in every case.

Summary

In conclusion, symptom-based criteria alone do not always discriminate FFR from disease. Colonic manometry clarified colonic physiology for the clinician and parent. For a small group of patients with atypical histories or a lack of response to medical management, colonic manometry results in prompt, accurate diagnosis.

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