Anorectal Physiologic Evaluation of Constipation

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ABSTRACT

Chronic constipation is a widespread problem which affects ~63 million people in North America alone. Although the majority of patients respond to changes in dietary fiber and water intake, as well as the judicious use of laxatives, a small portion will not and as a result, will be evaluated by gastroenterologists and colorectal surgeons. These patients most frequently have slow transit constipation, pelvic floor dysfunction, or some combination of the two. The physiologic evaluation of these patients comprises colonic transit studies, anorectal manometry, cinedefecography, electromyography, and pudendal nerve terminal motor latency testing. In this article, the authors describe the physiologic basis for these studies and review the techniques used in diagnosing these conditions.

KEYWORDS: Constipation, anorectal physiology, manometry, defecography

Objectives: Upon completion of this article, the reader should have an understanding of the etiology of constipation and the available diagnostic investigation techniques in the anorectal physiology laboratory.

Chronic constipation is very common, affecting ~63 million people in North America alone. The prevalence of the problem is highly variable, ranging from 2 to 28%.¹ This high level of variability is due to the many different definitions of constipation. Doctors tend to define constipation based on the number of bowel movements per week; however, patients may complain of constipation based on a myriad of other symptoms, including degree of straining during defecation or consistency of the stool. Multiple attempts have been made to define constipation to be better able to characterize and study the disease. The Rome criteria, initially introduced in 1988 and modified twice since then, became the research standard definition for constipation.² The most updated consensus definition of functional constipation, the Rome III criteria, was published in April 2006.³ The criteria are shown in Table 1, and

take into account the need to strain or perform manual maneuvers, anorectal sensation, consistency and number of stools, and the need for laxative use. Although these criteria provide a limited definition of constipation, they serve as a standard, which can be used to compare across studies.

The etiology of constipation is as variable as its symptomatology. Constipation can be classified as primary or secondary, and can be further divided between slow transit constipation and pelvic floor dysfunction. There are many physiologic variables that must fall into place to successfully defecate, and any number of factors can interfere with this process. A large portion of patients will resolve their constipation with an increase in the intake of water and dietary fiber. Beyond that, activity level, medications, medical illness, and mechanical obstruction from tumors can all be responsible for

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Table 1 Diagnostic Criteria for Functional Constipation*

1. Must include two or more of the following:
 - Straining during at least 25% of defecations
 - Lumpy or hard stools in at least 25% of defecations
 - Sensation of incomplete evacuation for at least 25% of defecations
 - Sensation of anorectal obstruction/blockage for at least 25% of defecations
 - Manual maneuvers to facilitate at least 25% of defecations (e.g., digitally assisted evacuation, support of the pelvic floor)
 - Fewer than three defecations per week
2. Loose stools are rarely present without the use of laxatives.
3. There are insufficient criteria for irritable bowel syndrome.

*Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis.

the symptoms. Once these secondary causes have been ruled out, the remaining constipated patients will generally be found to have slow transit constipation, pelvic floor dysfunction, or some combination of the two.⁴

Given the high prevalence of chronic constipation throughout the population, it is important for the physician to understand the physiologic basis for the tests commonly used to evaluate constipation.

ANATOMY AND PHYSIOLOGY OF DEFECATION

Defecation is a complex process that occurs under both voluntary and involuntary control. The first stage of fecal evacuation is involuntary and involves the movement of colonic contents into the rectum. The second stage is the act of defecation. Normally, the rectum is collapsed and empty. As feces moves into the rectum, it distends to accommodate the bolus. This distention stretches sensory receptors within the rectal wall until the threshold is reached. At this point, the anal reflex is initiated, causing relaxation of the internal anal sphincter, contraction of the external anal sphincter, and a propulsive wave in the rectosigmoid pushing the fecal mass into the rectum. The external sphincter is reflexively contracted to prevent defecation, but can be voluntarily relaxed if it is appropriate and convenient at the time. If defecation is to be prevented, the external anal sphincter is contracted, stopping the passage of stool. The rectum accommodates the volume, and the sense of urgency passes.⁵ Another mechanism to maintain continence is the puborectalis muscle, which maintains the anorectal angle.⁶ The puborectalis muscle needs to relax, straightening the anorectal angle, to allow passage of stool. The act of defecation requires coordinated relaxation of the internal sphincter and external sphincter, an increase in intra-abdominal pressure, and straightening of the anorectal angle to be successful. Anything that interferes with this

coordinated muscle function can cause pelvic floor dysfunction. Obstruction of the passage of stool can also be caused by anatomic abnormalities such as mucosal intussusception or prolapse, rectocele, or sigmoidocele.

EVALUATION OF THE CONSTIPATED PATIENT

The evaluation of the chronically constipated patient begins with a thorough history, with specific interest paid to frequency and consistency of stools, straining, manual maneuvers to facilitate defecation, use of laxatives, sensation of incomplete emptying, anal or rectal pain, abdominal pain or nausea, rectal bleeding, and duration of symptoms. History of previous colonoscopy, medical problems, and any medications used should also be evaluated. Any association of symptoms with psychological disturbances or stressors should also be elicited.⁵

The physical examination should include a digital rectal examination and anoscopy. This allows evaluation of any perianal pathology such as hemorrhoids, fissures, an abscess, a fistula, or mass that may be interfering with normal defecation. One can also examine the function of the sphincters and look for rectal prolapse by asking the patient to relax, squeeze, and push. Digital rectal examination may be sufficient in some straightforward cases. It is useful for evaluating high-grade intussusception, resting and squeezing pressures, length of the anal canal, but is not a good test of perineal descent.⁷ It also does not give exact values, so patients that may require surgery benefit from more extensive studies. A rectal examination may serve as a guide in deciding what studies to proceed with.

The next step in the evaluation of constipation is ruling out obstruction due to tumor. This can simply be done with a colonoscopy or contrast enema. In a large retrospective study of patients with constipation undergoing endoscopy, 1.6% were found to have colon cancers and 14.4% were found to have adenomas.⁸ Although this frequency is similar to that found in studies of endoscopic screening in asymptomatic patients, any patient with constipation who does not have another obvious etiology should undergo cancer screening. Barium enema may be useful particularly in identifying structural abnormalities leading to constipation, such as Hirschsprung's disease or extrinsic compression of the colon.

Most patients will respond to dietary modifications or will have a treatable condition identified with routine evaluation. The small number of patients who do not respond to the usual treatments of constipation and are believed to have symptoms due to functional problems are the ones who benefit from further physiologic testing. The goal of further testing is to differentiate between slow transit constipation and outlet obstruction, and to identify the etiology, including pudendal neuropathy, paradoxical puborectalis contraction, rectocele,

rectal intussusception, increased perineal descent, or nonrelaxation of the puborectalis.

COLONIC TRANSIT STUDIES

Studying colonic transit is helpful in differentiating between slow transit constipation and pelvic floor dysfunction. Colonic transit may be evaluated with radiopaque markers or by radionuclide techniques. The more widely used technique requires the patient to ingest radiopaque markers and then evaluates transit by taking one or serial abdominal x-rays. The simplest method has the patient take a gel capsule containing 24 markers on day 0. The patient is to abstain from taking any laxatives, enemas, or medications that may affect bowel function during the testing period, and is placed on a high-fiber diet containing 20 to 30 g of fiber. An abdominal x-ray is taken on days 3 and 5, or sometimes only on day 5. Normal transit is shown by 20% or less markers remaining in the colon at day 5. The presence of markers scattered throughout the colon is indicative of colonic inertia, whereas markers grouped in the rectosigmoid is consistent with pelvic floor dysfunction. A more detailed, but cumbersome study may be done to evaluate transit in different segments of the colon. For this study, patients ingest the capsule and then undergo serial daily x-rays starting on day 3. Another variation has the patient ingest capsules containing differently shaped markers on each of 3 consecutive days and then x-rays are taken to extrapolate the motility in separate segments of the colon. The mean colonic transit time has been shown to be 31 hours in men and 39 hours in women.⁹

Colonic motility may also be evaluated by scintigraphy. This test is much less widely available and is more expensive. One advantage of scintigraphy is that the test requires 24 to 48 hours as opposed to the radiographic

test, which takes ~1 week.¹⁰ It can also be used to evaluate transit through the small intestine at the same time. This study requires the patient to ingest a radio-labeled meal. Normal small bowel transit time is between 90 and 120 minutes.⁹

Once colonic transit study has shown slow transit, it is important to evaluate transit through the small bowel to differentiate between colonic and panenteric inertia. A small bowel transit study can be performed with scintigraphy as described above or via a hydrogen breath test. This study depends on the presence of lactulose-metabolizing bacteria, which is present in the colons of 75% of subjects. The patient ingests the lactulose and hydrogen content of the breath is measured serially until there is a 2- to 3-fold increase in the breath content. This signifies the time when the lactulose has reached the cecum. The test is limited in that 25% of patients lack the bacteria necessary, and bacterial activity may be affected by low colonic pH, bacterial overgrowth, or antibiotics.¹⁰

CINEDEFECOGRAPHY

Cine-defecography is likely the most useful tool available to evaluate the constipated patient. This study provides a dynamic evaluation of the entire defecation process, allowing the patients symptoms to be correlated with function. For the study, water-soluble contrast is instilled into the vagina. Thin barium is introduced into the rectum to delineate the rectal wall and thickened barium paste to simulate stool. The patient is then seated on a radiolucent commode and still radiographs are taken during rest, squeeze, and push. Fluoroscopic dynamic images are then taken while the patient defecates. Measurements of the anorectal angle, puborectalis length, and perineal plane distance are taken from the rest, squeeze, and push static films (Figs. 1–3). Defecography allows us

Figure 1 Perineal descent distance line drawn perpendicular to pubis-coccygeal line to anorectal junction: (A) perineal descent distance at rest, (B) perineal descent distance while pushing.

Figure 2 Puborectalis length measured from pubis to anorectal junction: (A) puborectalis length at rest, (B) puborectalis length while pushing.

to diagnose anatomic and functional abnormalities such as rectocele, sigmoidocele, abnormal perineal descent, nonrelaxation of the puborectalis, intussusception, prolapse, and incomplete emptying of the rectum (Figs. 4–7).

In a series of 2,816 patients with defecation disorders undergoing defecography, 77% of patients had some pathologic finding. Thirty-one percent had rectal intussusception, 13% had rectal prolapse, 27% had rectocele, 19% had enterocele, 21% had a combination of two or more findings. Sixty-seven percent of the patients were being evaluated for constipation.¹¹ In our own series of 744 patients evaluated by defecography, 446 patients were evaluated for a complaint of constipation. Twenty-six percent had rectocele, 13% had intussusception, 11% had sigmoidocele, 8% had rectal prolapse, and 30% had

multiple findings. Twelve percent had a normal study. In this series, paradoxical puborectalis contraction was significantly associated with a complaint of constipation.¹²

ANORECTAL MANOMETRY

Anorectal manometry can provide useful information about the function of the anal sphincters and distal rectum. There are several methods described, but the basic principle is that a transducer is used to measure pressures within the distal rectum and anal canal. The measurements are taken either in a continuous pull-through fashion, or at predetermined levels within the anal canal. The patient is positioned in the left lateral decubitus position and the transducer catheter is introduced into the anal canal. The most common transducer

Figure 3 Anorectal angle measured between lines depicting anal canal axis and rectal axis: (A) anorectal angle at rest, (B) anorectal angle while pushing.

Figure 4 Anterior rectocele showing measurement lines.

used currently is a water-perfused pressure catheter. As the catheter is pulled out at a fixed rate, the patient is instructed to relax or squeeze. The mean resting and squeezing pressures are measured. Resting pressure is provided mostly by the internal anal sphincter, whereas squeezing pressure reflects the external sphincter function. In a study of 19 normal patients, mean resting pressure was ~ 59 mmHg, mean squeezing pressure was ~ 88 mmHg.¹³ In a recent study of 50 patients with slow transit constipation evaluated by manometry, the pressure was found to be significantly lower than in normal controls. This may influence the risk of potential incontinence after subtotal colectomy with ileorectal anastomosis.¹⁴ In constipated patients, it is useful to also measure pressure during straining. Paradoxical sphincter contraction with straining may be found in some normal

Figure 5 Intussusception. Characteristic mucosal funneling.

Figure 6 Third degree sigmoidocele. Shows descent of sigmoid during evacuation.

Figure 7 Paradoxical puborectalis contraction. Arrow shows anorectal angle with minimal change: (A) at rest, (B) with pushing.

Figure 8 Rectoanal inhibitory reflex. External anal sphincter contraction followed by internal anal sphincter relaxation when balloon is expanded in high-pressure zone.

patients, but is also found in patients with anismus or obstructed defecation.¹⁵ The second phase of the test measures rectal sensation and the rectoanal inhibitory reflex (RAIR) (Fig. 8). A balloon at the end of the transducer is filled with 10 to 30 mL of water or air in the rectum and the response is measured. If the RAIR is present, the distention in the rectum should produce a reflex contraction of the external anal sphincter, followed by relaxation of the internal anal sphincter. This is abnormal in patients with Hirschsprung's disease, scleroderma, or Chagas' disease.^{16,17} Rectal sensation is measured by filling the balloon in the rectum with increasing amounts of water or air and recording the volume at which the patient first feels the balloon and at the point of maximal tolerated volume. Poor rectal sensation is seen in patients whose volume at first sensation and maximal tolerated volumes are high. An association between poor rectal sensation and poorer outcomes after subtotal colectomy for colonic inertia has been shown.¹⁸ This test may provide useful preoperative information for these patients. The normal values used in our laboratory are summarized in Table 2.

ELECTROMYOGRAPHY AND PUDENDAL NERVE LATENCY

Electromyography (EMG) utilizes an electrode to record the electrical potentials across motor units, which allows a quantification of muscle recruitment. In patients

with constipation, the test is used to evaluate puborectalis relaxation during simulated defecation. Surface electrodes or a lubricated sponge electrode are placed in the anal canal and the patient is then asked to simulate defecation while muscle recruitment is measured. This test may also be performed using needle electrodes placed in the anal canal, but this is more painful. Sponge EMG provides equivalent information as needle EMG in the evaluation of constipation and is better tolerated by patients.¹⁹ An EMG may provide useful information about the presence of paradoxical puborectalis contraction or nonrelaxation of the puborectalis muscle. A study is considered normal when there is good recruitment of motor units during squeezing and relative relaxation of the muscle during attempted defecation. A lack of significant relaxation is consistent with the diagnosis of paradoxical puborectalis contraction.

Table 2 Normal Values for Manometry

Test	Normal Values
Resting pressure	50–70 mm Hg
Squeeze pressure	100–180 mm Hg
Rectoanal inhibitory reflex	Present
Rectal compliance	2–6 mL H ₂ O/cm
Sensory threshold	10–30 mL
Maximum tolerated volume	100–300 mL
High-pressure zone length	2–3 cm (Female) 2.5–3.5 cm (Male)

Figure 9 (A, B) Finger-mounted pudendal nerve terminal motor latency electrode.

Measurement of the pudendal nerve terminal motor latency (PNTML) can be used to document chronic injury to the pudendal nerves, as can be seen in rectal prolapse and other constipation-associated conditions. PNTML is performed with a nerve-stimulating and recording device mounted on a gloved finger (Fig. 9).²⁰ The response time from stimulation of the nerve to muscle response is measured. Normal PNTML value is 2.0 ms, and values >2.3 ms are considered abnormal.²¹ Prolonged PNTML may be seen in fecal incontinence, constipation, or rectal prolapse. It is unclear whether pudendal neuropathy causes disordered defecation or is a result of nerve damage from straining.

OTHER STUDIES

Balloon Expulsion Test

The balloon expulsion test is performed by placing a balloon filled with 60 mL of air or water into the patient's rectum; the patient then sits on a commode and evacuates the balloon. This study may be done at the same time as anal manometry. The ability to evacuate the balloon within 2 minutes is considered normal. A study evaluating 21 patients who had nonrelaxing puborectalis on defecography showed that the balloon expulsion test may be useful to show which of those patients are actually symptomatic due to their pelvic floor dysfunction and disordered defecation. The authors argue that finding a nonrelaxing puborectalis on defecography is common and that not all these patients are actually symptomatic.²² On the other hand, a normal balloon expulsion test does not necessarily rule out a functional disorder, as the balloon is not exactly like normal stool and may not serve as an adequate substitute.²³

Pelvic Magnetic Resonance Imaging

As pelvic magnetic resonance imaging (MRI) has gained ground as a useful tool in the evaluation of fecal incon-

tinence, MR defecography has been explored as a less invasive test that spares the constipated patient the need for rectal contrast or radiation exposure. The study requires an air-filled rectum to serve as contrast. In a study comparing dynamic MRI and defecography, MRI was able to identify 8% of the anterior rectoceles, 50% of posterior rectoceles, 75% of sigmoidoceles, and 0 out of 4 cases of internal intussusception. There was a significant discrepancy in measurements of perineal descent and anorectal angle between the two modalities. MRI was able to identify 7 cystoceles, which are not seen on defecography. In 8 of the 22 patients, there was not enough air in the rectum to perform the MRI study.²⁴ An advantage of MRI is that it allows examination of the other pelvic organs at the same time. The problem of lacking rectal air can be solved by using gel in the rectum for contrast. However, given the higher cost and lower yield of the technique, MRI defecography is not recommended as a standard technique.

As there is no individual test that can diagnose all aspects of constipation, many innovative ideas continue to surface in the literature, such as three-dimensional dynamic ultrasound,^{25,26} scintigraphic defecography,²⁷ viscous fluid expulsion,²⁸ or the rectal cooling test.²⁹ There is still not enough data about these methods to recommend them.

CONCLUSION

In the evaluation of the severely constipated patient who fails to respond to a high-fiber diet and careful use of laxatives, the first question that must be answered is whether the patient has slow transit constipation or outlet obstruction. Colonic transit studies will differentiate between colonic inertia and pelvic floor dysfunction. Anal manometry is useful in ruling out Hirschsprung's disease if the rectoanal inhibitory reflex is present. Manometry, along with EMG tests can also show paradoxical puborectalis contraction by measuring sphincter pressures and puborectalis contraction during

straining. Defecography is useful in delineating anatomic and functional abnormalities such as rectocele, sigmoidocele, internal intussusception, increased perineal descent, rectal prolapse, paradoxical puborectalis contraction, and failure of relaxation of the puborectalis.

REFERENCES

- Higgins PD, Johanson J. Epidemiology of constipation in North America: a systematic review. *Am J Gastroenterol* 2004;99(4):750-759
- Thompson WG, Longstreth GF, Drossman DA, Heaton KW, Irvine EJ, Müller-Lissner SA. Functional bowel disorders and functional abdominal pain. *Gut* 1999; 45(Suppl 2):1143-1147
- Longstreth GF, Thompson W, Chey W, Houghton L, Mearin F, Spiller R. Functional bowel disorders. *Gastroenterology* 2006;130(5):1480-1491
- Candelli M, Nista EC, Zocco MA, Gasbarrini A. Idiopathic chronic constipation: pathophysiology, diagnosis and treatment. *Hepatogastroenterology* 2001;48(40):1050-1057
- Corman M. *Colon and Rectal Surgery*. 5th ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2005:457-486
- Parker S, Collier J. Anal physiology. In: Wolff B, Fleshmann J, Beck D, Pemberton J, Wexner S, eds. *ASCRS Textbook of Colon and Rectal Surgery*. New York, NY: Springer; 2007: 33-39
- Siproudhis L, Ropert A, Vilotte J, et al. How accurate is clinical examination in diagnosing and quantifying pelvic rectal disorders? A prospective study in a group of 50 patients complaining of defecatory difficulties. *Dis Colon Rectum* 1993;36(5):430-438
- Pepin C, Ladabaum U. The yield of lower endoscopy in patients with constipation: survey of a university hospital, a public county hospital, and a veterans administration medical center. *Gastrointest Endosc* 2002;56:325-332
- Metcalfe A, Ross H. Constipation. In: Wolff B, Fleshmann J, Beck D, Pemberton J, Wexner S, eds. *ASCRS Textbook of Colon and Rectal Surgery*. New York, NY: Springer; 2007: 678-686
- Smith L, Blatchford G. In: Wolff B, Fleshmann J, Beck D, Pemberton J, Wexner S, eds. *ASCRS Textbook of Colon and Rectal Surgery*. New York, NY: Springer; 2007:40-55
- Mellgren A, Bremner S, Johansson C, et al. Defecography: results of investigations in 2,816 patients. *Dis Colon Rectum* 1994;37(5):1133-1141
- Agachan F, Pfeifer J, Wexner SD. Defecography and proctography: results of 744 patients. *Dis Colon Rectum* 1996;39(8):899-905
- Bharucha AE, Seide B, Fox J, Zinsmeister A. Day-to-day reproducibility of anorectal sensorimotor assessments in healthy subjects. *Neurogastroenterol Motil* 2004;16:241-250
- Lundin E, Graf W, Karlhom U. Anorectal manovolumetry in the decision making before surgery for slow transit constipation. *Tech Coloproctol* 2007;11:259-265
- Voderholzer WA, Neuhaus DA, Klauser AG, Tzavella K, Müller-Lissner SA, Schindlbeck NE. Paradoxical sphincter contraction is rarely indicative of anismus. *Gut* 1997; 41(2):258-262
- Anuras S, Hade JE, Soffer E, et al. Natural history of adult Hirschsprung's disease. *J Clin Gastroenterol* 1984;6(3):205-210
- Basilisco G, Barbera R, Vanoli M, Bianchi P. Anorectal dysfunction and delayed colonic transit in patients with progressive systemic sclerosis. *Dig Dis Sci* 1993;38(8):1525-1529
- Pluta H, Bowes KL, Jewell LD. Long-term results of total abdominal colectomy for chronic idiopathic constipation. Value of preoperative assessment. *Dis Colon Rectum* 1996; 39:160-166
- Pfeifer J, Teoh TA, Salanga VD, Agachan F, Wexner SD. Comparative study between intra-anal sponge and needle electrode for electromyographic evaluation of constipated patients. *Dis Colon Rectum* 1998;41:1153-1157
- Kiff ES, Swash M. Slowed conduction in the pudendal nerves in idiopathic (neurogenic) faecal incontinence. *Br J Surg* 1984;71:614-616
- Swash M, Snooks SJ. Motor nerve conduction studies of the pelvic floor innervation. In: Henry MM, Swash M, eds. *Coloproctology and the Pelvic Floor*. 2nd ed. London: Butterworth-Heinemann; 1992:196-206
- Fleshman JW, Dreznik Z, Cohen E, Fry R, Kodner I. Balloon expulsion test facilitates diagnosis of pelvic floor outlet obstruction due to nonrelaxing puborectalis muscle. *Dis Colon Rectum* 1992;35(11):1019-1025
- Bharucha AE. Update of tests of colon and rectal structure and function. *J Clin Gastroenterol* 2006;40(2):96-103
- Matsuoka H, Wexner SD, Desai MB, et al. A comparison between dynamic pelvic magnetic resonance imaging and videoproctography in patients with constipation. *Dis Colon Rectum* 2001;44:571-576
- Beer-Gabel M, Teshler M, Barzilai N, et al. Dynamic transperineal ultrasound in the diagnosis of pelvic floor disorders: pilot study. *Dis Colon Rectum* 2002;45(2):239-245
- Murad-Regadas SM, Regadas FS, Rodrigues LV, et al. A novel procedure to assess anismus using three-dimensional dynamic anal ultrasonography. *Colorectal Dis* 2007;9(2): 159-165
- Hutchinson R, Mostafa AB, Grant EA, et al. Scintigraphic defecography: quantitative and dynamic assessment of anorectal function. *Dis Colon Rectum* 1993;36(12):1132-1138
- Alstrup N, Ronholt C, Fu C, Rasmussen O, Sorensen M, Christiansen J. Viscous fluid expulsion in the evaluation of the constipated patient. *Dis Colon Rectum* 1997;40(5):580-584
- Shafik A, Shafik I, El Sibai O, Shafik AA. Rectal cooling test in the differentiation between constipation due to rectal inertia and anismus. *Tech Coloproctol* 2007;11(1): 39-43