

# American Urogynecologic Society Best-Practice Statement on Evaluation of Obstructed Defecation

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**Abstract:** The symptoms of constipation and obstructed defecation are common in women with pelvic floor disorders. Female pelvic medicine and reconstructive surgery specialists evaluate and treat women with these symptoms, with the initial consultation often occurring when a woman has the symptom or sign of posterior compartment pelvic organ prolapse (including rectocele or enterocele) or if a rectocele or enterocele is identified in pelvic imaging. This best-practice statement will review techniques used to evaluate constipation and obstructed defecation, with a special focus on the relationship between obstructed defecation, constipation, and pelvic organ prolapse.

**Key Words:** obstructed defecation, defecation, anorectal obstruction, chronic constipation, incomplete rectal evacuation

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The symptoms of constipation and obstructed defecation are common in women with pelvic floor disorders. Female pelvic medicine and reconstructive surgery specialists evaluate and treat women with these symptoms, with the initial consultation often occurring when a woman has the symptom or sign of posterior compartment pelvic organ prolapse (POP; including rectocele or enterocele) or if a rectocele or enterocele is identified in pelvic imaging. This best-practice statement will review techniques used to evaluate constipation and obstructed defecation, with a special focus on the relationship between obstructed defecation, constipation, and POP.

## OVERVIEW

Normal defecation is a complex event coordinated between colorectal motor and sensory functions and appropriate behavior. In normal function, stool enters the rectum from the sigmoid colon, leading to distention. Once the rectosigmoid stool load is perceived and the setting is deemed appropriate for defecation, the puborectal angle is voluntarily changed by sitting or squatting, pelvic floor and anal relaxation occur, straining leads to increased intraabdominal pressure, and the rectum contracts, resulting in the voluntary act of defecation.

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The sensation of anorectal obstruction or blocking is one of many criteria that may be used to diagnose constipation. Chronic constipation (symptoms >6 months) is common, with a prevalence in the general population of approximately 14%.<sup>1</sup> Symptoms used to define constipation include the following: straining, sense of incomplete evacuation, infrequent bowel movements, and hard stool consistency.<sup>2</sup> A more detailed definition is provided by the *Rome classification system* (currently Rome III diagnostic criteria<sup>2</sup>; Table 1). Causes of constipation vary widely and include systemic medical issues such as metabolic and neurologic disorders, obstructive intestinal disease, and medication adverse effects, most notably related to narcotic and anticholinergic medications. Chronic constipation is often divided into disordered colonic transit (slow-transit constipation) and normal transit, which includes pelvic or anorectal dysfunction (outlet obstruction constipation or obstructive defecation syndrome). Obstructive defecation is incomplete rectal evacuation, which may result from inadequate rectal propulsive forces and/or increased resistance to evacuation<sup>3</sup> and can be related to dyssynergic defecation or anatomic abnormalities (rectoceles, enteroceles, internal rectal intussusception).

Pelvic organ prolapse is a downward displacement of pelvic organs including the uterus and/or vaginal compartments and neighboring organs such as the bladder, rectum, or bowel.<sup>4</sup> Posterior compartment prolapse is a condition in which the posterior vaginal wall descends toward the vaginal opening and includes rectoceles, enteroceles, sigmoidoceles, intussusceptions, and perineal descent. Among postmenopausal women, the prevalence of posterior vaginal wall prolapse is 18%.<sup>5</sup> Prolapse primarily refers to anatomic change with the corresponding symptoms of vaginal bulge, pelvic pressure, or a dragging sensation. Anorectal dysfunction symptoms that are potentially prolapse related include constipation, feeling of incomplete bowel evacuation, straining to defecate, sensation of anorectal blockage, splinting or digitation, fecal urgency, and postdefecatory soiling.<sup>4</sup> However, these symptoms can often be related to other etiologies, such as slow-transit constipation, which may require different treatment strategies.

## HISTORY AND PHYSICAL EXAMINATION

The initial evaluation of a woman with defecatory dysfunction should include a thorough history and physical examination. The history should focus on the specific bothersome symptoms of defecatory dysfunction including frequency and consistency of bowel movements, anorectal pain, bleeding, and the need to strain and use of additional maneuvers with defecation, including splinting (applying pressure on the vagina, perineum, or anus), digitation (use of fingers to evacuate stool), or other manipulation to assist with defecation. Splinting is the only symptom reliably associated with posterior POP.<sup>6</sup>

It is imperative to assure that the patient does not have colorectal cancer. Patients with the following symptoms merit referral and evaluation by colonoscopy: a recent change in bowel habits, excessive straining or a sense of incomplete evacuation, abdominal pain, bloating, rectal bleeding, and weight loss.<sup>3</sup> A complete medical history that evaluates for medical causes of constipation such as neurogenic disorders and hypothyroidism (Table 2) should be taken. Details on dietary preferences, medication use (with a

**TABLE 1.** Rome III Criteria**Functional Constipation**

## 1. Diagnostic criteria\*

Must include  $\geq 2$  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 (eg, digital evacuation and support of the pelvic floor).
  - Fewer than 3 defecations per week
- Loose stools are rarely present without the use of laxatives.
  - Insufficient criteria for irritable bowel syndrome

**Functional Defecation Disorders**

## Diagnostic criteria\*

- The patient must satisfy diagnostic criteria for functional constipation (see above).
- During repeated attempts to defecate must have  $\geq 2$  of the following:
  - Evidence of impaired evacuation, based on balloon expulsion test or imaging
  - Inappropriate contraction of the pelvic floor muscles (ie, anal sphincter or puborectalis) or  $<20\%$  relaxation of basal resting sphincter pressure by manometry, imaging, or EMG
  - Inadequate propulsive forces assessed by manometry or imaging

**Dyssynergic defecation**

## Diagnostic criterion

Inappropriate contraction of the pelvic floor or  $<20\%$  relaxation of basal resting sphincter pressure with adequate propulsive forces during attempted defecation

**Inadequate defecatory propulsion**

## Diagnostic criterion

Inadequate propulsive forces with or without inappropriate contraction or  $<20\%$  relaxation of the anal sphincter during attempted defecation

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

EMG, electromyography.

focus on medications known to cause constipation), and digestive aids and laxative use should be elicited, and family history and risk factors for colon and rectal cancer should be collected.

The physical examination should include assessment of pelvic floor muscle function with strength and relaxation testing, pelvic floor support evaluation with Pelvic Organ Prolapse Quantification (POP-Q) system, and a rectal examination.<sup>3</sup> The rectal examination should be done with the buttocks separated and should start with observation. Specifically, look for causes of pain (grade  $\geq$ II hemorrhoids [Fig. 1], anal fissure) that may be causing voluntary stool retention, a gaping or asymmetric anus suggestive of neurologic injury, and any evidence of fecal soiling on the perineal skin. Test for perineal descent during simulated evacuation and elevation during a squeeze and the anal reflex (tested by a light pinprick or scratch). This demonstrates pelvic floor coordination and confirms intact sacral reflexes.

In addition to the customary screening for masses and scarring, digital rectal examination assesses the anal sphincter resting tone and augmentation with squeeze. At the start of digital rectal examination, the patient can be asked to bear down on the examiner's finger to assess the ability of the sphincter to relax with

**TABLE 2.** Causes of Chronic Constipation**Neurogenic Disorders**

Peripheral  
Diabetes mellitus  
Autonomic neuropathy  
Hirschsprung disease  
Chagas disease  
Intestinal pseudo-obstruction  
Central  
Multiple sclerosis  
Spinal cord injury  
Parkinson disease  
Irritable bowel syndrome  
Drugs

**Nonneurogenic Disorders**

Hypothyroidism  
Hypokalemia  
Anorexia nervosa  
Pregnancy  
Panhypopituitarism  
Systemic sclerosis  
Myotonic dystrophy  
Idiopathic constipation  
Normal colonic transit  
Slow-transit constipation  
Dyssynergic defecation

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straining. Finally, assessment for anoperineal or rectovaginal pocketing should be done. This involves inserting a finger and palpating toward the vagina to elicit weakness in the rectovaginal septum and perineal body. Extensive pocketing large enough to trap 2 to 3 cm of stool is indicative of rectocele or perineocele.

Correlation between specific defecatory symptoms and physical examination is not clear. Multiple studies show no relationship between POP-Q and bowel symptoms,<sup>7-9</sup> constipation,<sup>10</sup> and obstructed defecation symptoms,<sup>7</sup> whereas weak correlation has been found between worsening posterior vaginal wall prolapse and the need for vaginal, rectal, or perineal splinting.<sup>6,11</sup> This lack of consensus is likely related to limitations inherent to the POP-Q examination,<sup>12</sup> which evaluates vaginal topography only. Posterior defects, even when large, often bulge anteriorly within the vagina and not necessarily outward beyond the hymen. Nonetheless, bowel symptoms resolve in many patients once the vaginal wall defect is corrected by posterior colporrhaphy.<sup>13,14</sup> Corrected vaginal support is associated with a reduced risk of postoperative straining, feeling of incomplete emptying,<sup>13</sup> and difficulty evacuating.<sup>14</sup> In most women with bulge symptoms and posterior vaginal wall prolapse, no imaging is required before surgery.

No specific symptom or physical examination finding is sensitive and specific for obstructed defecation syndrome. The apparent lack of correlation between the anatomic assessment and

**FIGURE 1.** Hemorrhoids, a cause of anal pain.

anorectal symptoms highlights the complexity of anorectal dysfunction. This disconnect commonly prompts providers to seek additional testing that usually includes anorectal manometry and imaging studies.

## ANORECTAL TESTING

Additional information on function may be obtained by physiologic testing (anal manometry, pudendal nerve latencies, and electromyography). Anorectal manometry uses pressure-sensitive catheters to measure anorectal motility, including rectal sensation and compliance, reflexive relaxation of the internal anal sphincter (rectoanal inhibitory reflex), and manometric patterns produced upon attempted expulsion of a balloon. Data from anorectal manometry help with the diagnosis of dyssynergic defecation (paradoxical contraction or failure of anal relaxation with attempts to empty the rectum of contents) and rectal sensory problems. It is important to distinguish between diagnoses, as dyssynergic defecation and sensory problems are rarely treated surgically. Before testing, the patient empties the lower gastrointestinal tract with the use of 1 or 2 enemas 2 hours before the study. To assess reflex pathways, a small balloon attached to a catheter is inflated in the rectum. The patient is asked to squeeze, relax, and push at various times. The anal sphincter muscle pressures are measured during each of these maneuvers. Pressures generated from the rectal balloon give some indication of abdominal pressures generated during attempted defecation, whereas pressure recordings of the anal sphincter indicate relaxation or inappropriate contraction of the external anal sphincter. Next, a balloon is inserted into the rectum and inflated with water (usually 50 mL). The patient attempts to expel the balloon from the rectum as a simulation of defecation. The amount of time it takes to expel the balloon is recorded, with less than 60 seconds representing normal values<sup>15</sup> (Fig. 2).

Studies show no correlation between prolapse and anorectal testing.<sup>16</sup> The physiology of defecation and the correlation between manometric findings and other objective measures of anorectal function are not completely understood.<sup>16,17</sup> In addition, artifact due to psychologic factors may affect test results in the laboratory setting. For example, in 20% of healthy controls, the anal sphincter does not relax on anal manometry during attempted defecation,<sup>18</sup> as seen in women with pelvic floor dyssynergia.

Optimal patient selection for anorectal manometry in the evaluation of constipation is not well established and the methods

used are not standardized. Anorectal manometry may be useful in constipated patients in whom nonmechanical causes of obstructive defecation are suspected and can assist in the diagnosis of decreased rectal sensation, pelvic floor dyssynergia, and Hirschsprung disease. In decreased rectal sensation, the patient can tolerate increasing volumes (>90 mL)<sup>19</sup> before detecting pressure or pain. This is associated with increased rectal compliance or megarectum, which is often seen in patients who have experienced chronic fecal impaction. In pelvic floor dyssynergia, women do not straighten the anorectal angle (ARA) during defecation as a result of failed relaxation of the puborectalis muscle and the external anal sphincter. In these patients, anorectal manometry demonstrates inappropriate contraction of the external anal sphincter while the patient is attempting to stimulate defecation. Anal manometry may be used to provide biofeedback in the treatment of chronic constipation, specifically pelvic floor dyssynergia.

In Hirschsprung disease (congenital megacolon), the absence of intramural ganglion cells of the submucosal and myenteric plexi leads to a segment of spastic, nonrelaxing, and nonpropulsive bowel. Proximal to this, the colon is severely dilated. On anal manometry, the internal anal sphincter does not relax with rectal distention. The accuracy of manometry testing to make this diagnosis (sensitivity and specificity of 83% and 93%, respectively) is good, but full-thickness biopsy is necessary for confirmation.<sup>20</sup> This diagnosis should be considered and excluded in young adults with severe constipation from birth.

Pudendal nerve terminal latency assessment<sup>21</sup> does not have evidence supporting its use in the workup of obstructed defecation syndrome. Electromyography can assist in the detection of dyssynergic defecation but is usually not necessary because the diagnosis can be made using less invasive methods.

## IMAGING STUDIES

Imaging studies are not a part of routine evaluation of pelvic floor disorders but may be obtained when the symptoms do not correlate with the physical examination findings or when surgical correction does not alleviate the symptoms. Several modalities are available including fluoroscopic defecography, dynamic magnetic resonance imaging (MRI), and ultrasound. Transit studies can be used to evaluate the upper and lower gastrointestinal function and may be a useful adjunct in diagnosing patients with constipation and defecatory complaints.

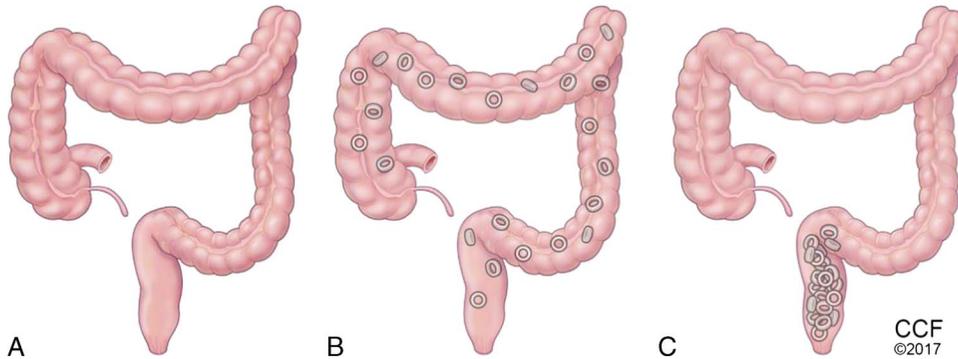
## Transit Studies

Transit studies are most useful in those patients with infrequent bowel movements, refractory to laxative or other conservative measures. These studies help rule out slow-transit constipation.<sup>22</sup> Patients may present with complaints of bloating, abdominal discomfort, and infrequent urge to have a bowel movement; the symptoms are not typically relieved by the usual interventions such as fiber supplementation.<sup>23</sup> If slow-transit constipation is diagnosed, it is critical to evaluate the possible etiologies and to treat this before considering obstructed defecation syndrome.

The Sitzmark transit study is the test most often used for the evaluation of slow-transit constipation and was first described in 1969 by Hinton et al.<sup>24</sup> The patient is instructed to stop taking laxatives, enemas, or suppositories for 5 days before the test. On day 0, the patient takes 1 gelatin capsule containing 24 precut radiopaque polyvinyl chloride markers. An x-ray of the abdomen is then obtained on day 5. The evaluation is considered normal if 19 or more markers (80%) are expelled. Patients who have 6 or more markers remaining are considered to have a positive study. If the markers are scattered throughout the colon, the diagnosis is likely colonic inertia, or slow-transit constipation. If the



FIGURE 2. Manometry catheter with balloon.



**FIGURE 3.** A, If 5 or fewer markers remain, the patient has grossly normal colonic transit. B, Most rings are scattered about the colon. The patient most likely has hypomotility or colonic inertia. C, Most rings are gathered in the rectosigmoid. The patient has functional outlet obstruction. Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved.

accumulation is mostly in the rectosigmoid, the etiology is more likely outlet obstruction<sup>25</sup> (Fig. 3).

### Fluoroscopic Defecography

Fluoroscopic defecography, also known as dynamic proctography, provides a functional assessment of the defecatory mechanics and the dynamic interaction between different anatomical compartments. Cystodefecography is a test similar to defecography, in which the rectum, the vagina, and the bladder are opacified with contrast. The 2 techniques are described interchangeably in the literature.

The rectum should be emptied before the study. Oral contrast of dilute barium solution (gastrograffin, barium suspension, and water) is given 30 to 45 minutes before the study to opacify the small bowel. If vaginal opacification is desired, contrast mixed with ultrasound gel is injected into the vagina. Rectal contrast is mixed with a specific rectal paste to stimulate stool consistency and inserted rectally before the study to visualize the rectum.<sup>26</sup> During the examination, the patient sits on a commode, which is positioned on the footrest of the fluoroscopic table, sideways to obtain a lateral view. For the patient's privacy and to minimize the radiation exposure, the radiologist and technologist remotely control fluoroscopy.

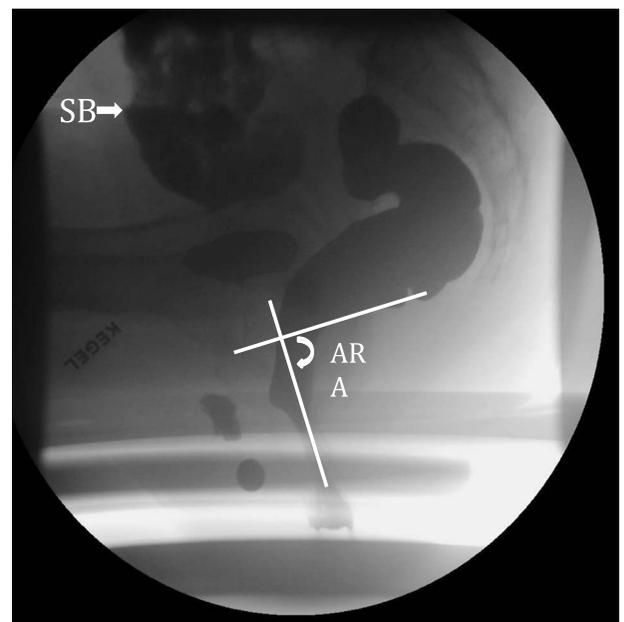
As discussed previously, the physiologic defecation process is preceded by a strong urge, which is triggered by rectal distention. Because defecography relies on volitional control of the pelvic floor and passive rectal emptying, it does not replicate the exact physiologic response. There are 3 stages in the evaluation: rest, evacuation, and recovery. During the resting stage, the anal canal should be closed. Leakage of stool contents during this phase should lead patient questioning about fecal incontinence. The anorectal junction (ARJ) and the ARA are measured. Anorectal junction is the uppermost point of the anal canal and is measured in relationship to the fixed bony point such as the ischial tuberosity or the pubococcygeal line (PCL). The craniocaudal migration of ARJ indirectly represents the elevation and descent of pelvic floor. Anorectal angle is an angle measured between the longitudinal axis of the anal canal and the posterior line, parallel to the longitudinal axis of the rectum, averaging approximately 90 degrees. The ARA is an indirect indicator of the puborectal muscle activity, becoming more acute with muscle contraction (75 degrees) and more obtuse with relaxation (Fig. 4).

The evacuation stage takes place when the patient strains to evacuate. The pelvic floor descent that takes place during this phase is measured as the change in distance of the ARJ from the anatomic fixed point (between rest and strain). The degree of caudal migration of ARJ is considered normal when less than 3.5 cm

relative to the resting position. During straining, as the canal opens, the rectum begins to empty. It is common to note a bulge of the anterior rectal wall, and this is not considered clinically significant if less than 2 cm (in the anteroposterior diameter).

Once the rectum is emptied, rectal prolapse and prolapse in other compartments can be evaluated with the patient maximally straining. Rectocele is evaluated using the system proposed by Wiersma et al<sup>27</sup> (Fig. 5), and the enterocele (Figs. 6, 7) grading system is based on the degree of bowel herniation: grade 0, normal position; grade I, reaching the distal to the distant half of the vagina; grade II, small bowel reaching down to the perineum; and grade III, herniation out of the vaginal canal.

Structural abnormalities during defecation seen on imaging may include internal intussusception, rectoceles, enteroceles, sigmoidoceles, perineal descent, and rectal prolapse.<sup>21</sup> Findings on defecography can enhance the understanding of obstructive defecation symptoms. In pelvic floor dyssynergy, the evacuation is significantly delayed (>30 seconds), the ARA does not



**FIGURE 4.** Defecography image demonstrating anal rectal angle (ARA) and small bowels (SB). Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved.

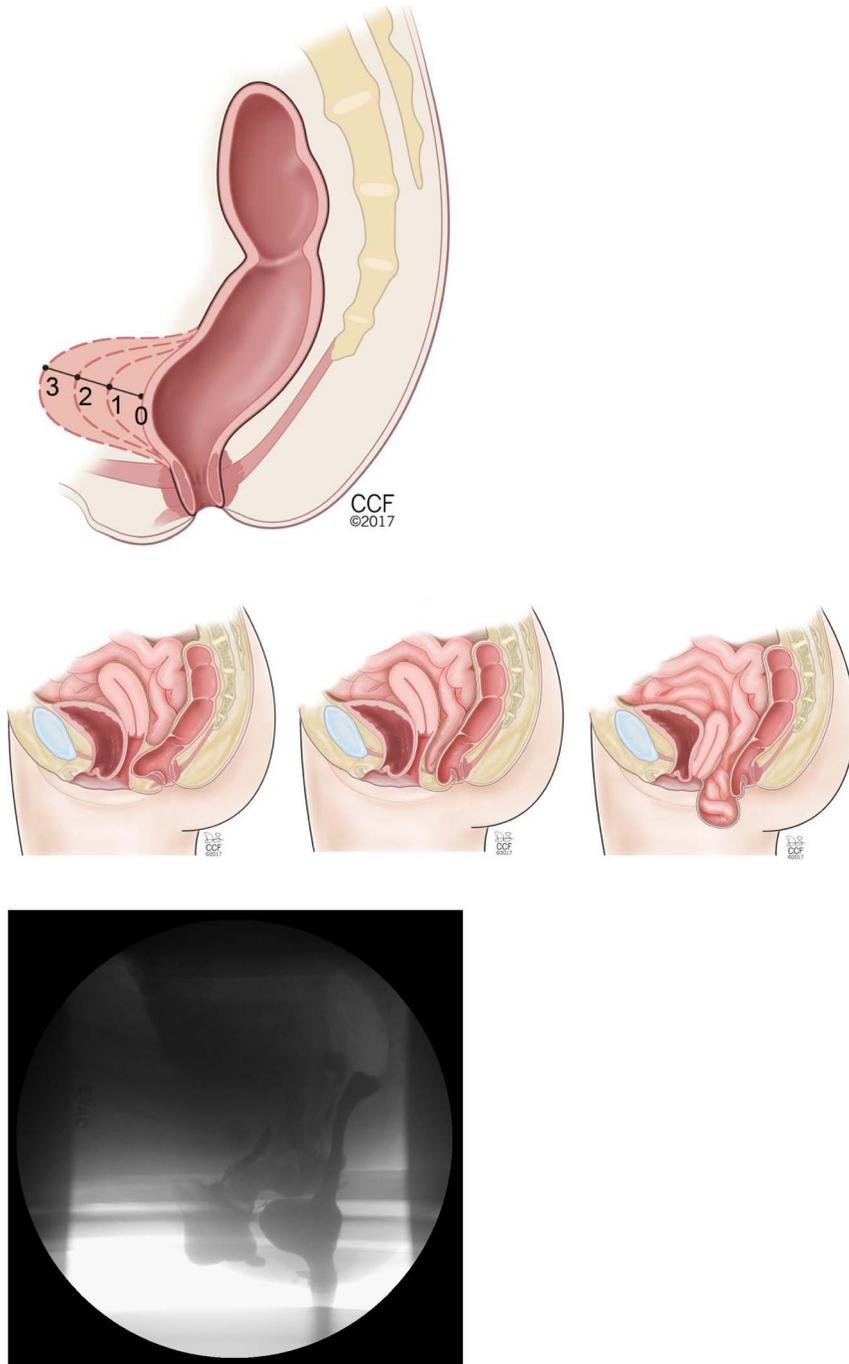


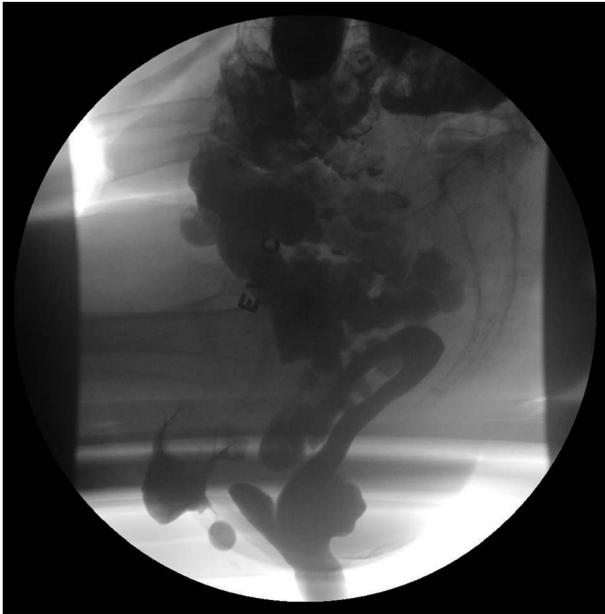
FIGURE 5. (Groenendijk). Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved.

widen adequately, and the anal canal narrows during straining due to a nonrelaxing puborectalis muscle.<sup>28</sup> Rectal prolapse is noted when the rectal wall intussuscepts into or through the anal canal (Fig. 8). When the vagina and small intestines are also opacified, the relationship between pelvic organs during defecation can be appreciated including the presence of vaginal or uterovaginal prolapse and enteroceles.

One problem with defecography is the overlap in findings between patients with chronic constipation and asymptomatic, healthy volunteers. In one study evaluating healthy volunteers

undergoing standard defecography, approximately two thirds of subjects demonstrated abnormal radiologic findings.<sup>29</sup> In addition, the formation of rectocele during defecation is a very common finding in healthy, asymptomatic women.<sup>30</sup> Therefore, anterior rectoceles seen on imaging that are not symptomatic do not need treatment.

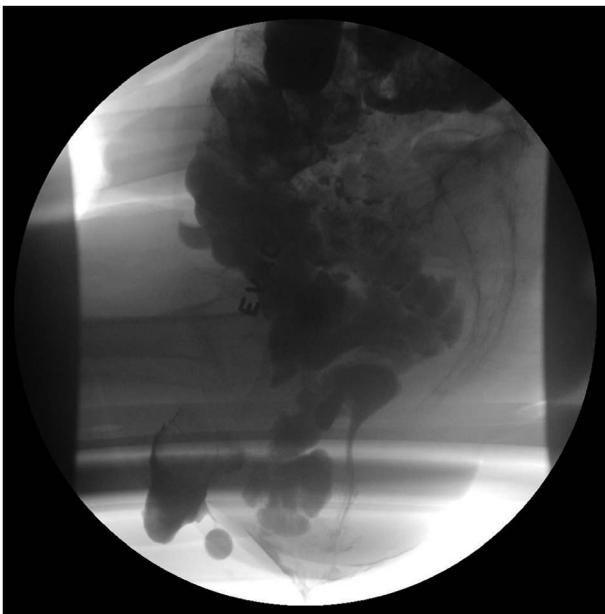
When considering patients with chronic constipation, studies demonstrate a poor correlation between the size of the rectocele on defecography and the clinical evaluation of prolapse (POP-Q point Bp)<sup>11,31–33</sup> as well as symptoms.<sup>34</sup>



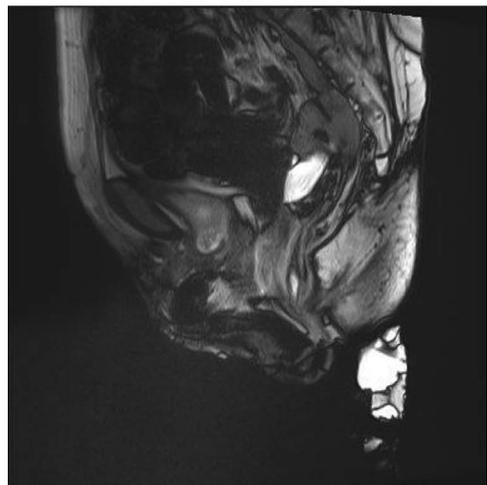
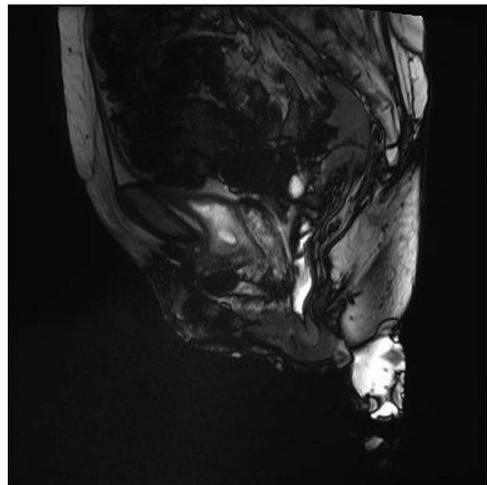
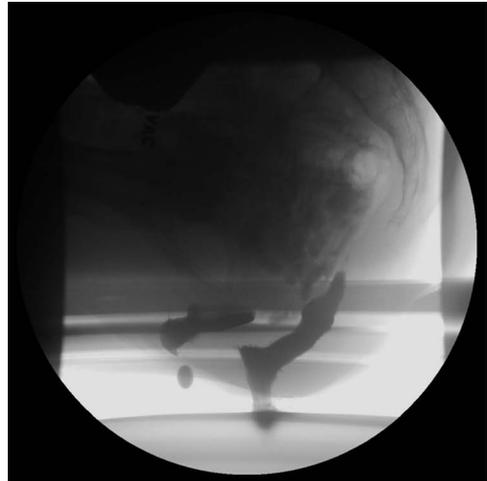
**FIGURE 6.** Rectal intussusception with enterocele. Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved.

**Dynamic MRI and MRI Defecography**

Dynamic MRI provides a functional assessment of the structures of the pelvic floor using a cine loop obtained at rest, squeeze, strain, and/or defecation.<sup>35</sup> Unlike fluoroscopy, MRI has no radiation exposure, allows for selection of multiple imaging planes, and offers excellent temporal resolution and unparalleled soft tissue contrast, making it the best modality to visualize soft tissue injury. These qualities make it a unique tool in the evaluation of patients with pelvic floor disorders. However, MRI is



**FIGURE 7.** Large enterocele. Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved.



**FIGURE 8.** Top: Rectal prolapse. Reprinted with permission from Cleveland Clinic Center for Medical Art & Photography © 2017. All rights reserved. Middle: Rectal prolapse. Used with permission of Dr. Paul Pettit. Bottom: Rectal prolapse and enterocele. Used with permission of Dr. Paul Pettit.

expensive and not always accessible, and clinical implications are unclear; therefore, it is not widely used outside the research setting.

When performing MRI during defecation, various rectal preparations may be used. The rectum should be filled with a contrast agent of a viscosity similar to that of fecal matter. Some authors suggest the use of ultrasound gel for rectal enema.<sup>36</sup> A closed-system MRI evaluates the patient in the supine position, which is nonphysiologic, particularly with regard to defecation. If an open, vertical system is available, the positioning simulates real-life anatomy, likely improving the quality of the study. While the patient is in a sitting position on a commode, the rectum is filled with contrast and the study takes place with a flexible radio-frequency coil wrapped around the pelvis. The images are obtained in the midsagittal plane at 2-second intervals at rest, at maximal sphincter contraction, during straining, and during defecation.

To evaluate pelvic prolapse on MRI, reference lines are drawn between various bony landmarks. Pubococcygeal line is a line from the inferior border of the symphysis pubis to the last coccygeal joint.<sup>37</sup> Midpubic line is a line extending along the longitudinal axis of the symphysis pubis in the sagittal plane. The midpubic line roughly corresponds to the level of the hymen, which is the reference point for the POP-Q evaluation.

Anismus, internal rectal prolapse, or enterocele may also be noted on MRI. In addition, defecation is described as complete or incomplete, depending on the presence or absence of the contrast material at the end of defecation.

There are 3 unique enterocele classification systems underlying the importance of communication between surgeon and radiologist. In one system, the PCL is used as the reference for enterocele classification. The extent of enterocele is measured at 90 degrees to the PCL from the lowest margin of herniation content during the evacuation effort. They are classified as small (<3 cm below the PCL), moderate (3–6 cm below), and large (>6 cm below the PCL).<sup>36</sup> As a normal cul-de-sac extends 4 to 5 cm along the posterior vaginal wall, small bowel in the posterior cul-de-sac (enterocele) is found in healthy, asymptomatic women and should not be considered pathologic.<sup>29,30</sup>

Intussusception (internal or occult rectal prolapse) may be classified as intrarectal or intra-anal prolapse if its apex penetrates the anal canal and remains there during straining. Once the rectal wall prolapses through the anal canal, the rectal prolapse is usually evident on clinical examination. Dynamic MRI with an evacuation phase is able to distinguish between a mucosal internal prolapse and a full-thickness prolapse.<sup>38</sup> Detection of these differences is critical because treatment plans are distinct.

Similar to fluoroscopic defecography, MRI may reveal anismus, or inability to relax the levator ani or anal sphincter muscles with attempted defecation, leading to prolonged attempted defecation (>30 seconds) and/or incomplete defecation. In addition, in patients with anismus, the anorectal angle is noted to decrease instead of increasing, likely due to the lack of puborectalis relaxation.<sup>39</sup>

When comparing supine dynamic MRI to fluoroscopic defecography, a small study reported agreement between the 2 modalities in identifying the presence and the degree of prolapse in different compartments.<sup>37</sup> Like defecography, MRI correlates poorly with the clinical examination of the posterior compartment.

Imaging studies of defecation are most physiologic when done on a commode. Because open MRI in a sitting position is considered more physiologic, with most studies demonstrating superiority to the supine position,<sup>40</sup> it is recommended to perform studies in this position when possible.

## Ultrasound

Transperineal, translabial, or endovaginal 3-dimensional (3-D) ultrasonography is another dynamic imaging modality that provides

functional assessment and is becoming more popular in the evaluation of pelvic floor disorders. It is an office procedure that is more accessible, inexpensive, and well tolerated by the patient. A major disadvantage is that it is challenging to add a defecography component to the evaluation because of patient positioning and because the examiner is directly performing the examination bedside, which limits information.

Typically, the ultrasound assessment is performed with the patient in lithotomy position. An abdominal 3-D probe is then placed on the perineum or at the labia, applying gentle pressure. The bladder is half-filled, and the rectum may be instilled with ultrasound gel. Images are acquired at rest, with contraction and maximal straining. The images then can be rendered in a 3-D view, and a 4-dimensional cine loop can also be obtained, demonstrating the dynamics of multicompartiment interaction.<sup>41</sup> A reference line may be placed through the margin of the symphysis pubis, and descent is analyzed against this line when comparing the image at rest versus at maximum Valsalva.

An anterior rectocele is seen as a ballooning of the anterior rectal wall into the vagina. An enterocele is visualized as the small bowel descends into the vagina with apparent peristalsis and an isoechoic appearance, occasionally with intraperitoneal fluid.<sup>41</sup> An intussusception is seen as an expansion of the anal canal and inversion of the rectal wall into the canal.

As with fluoroscopic defecography and MRI, ultrasound findings do not correlate well with POP-Q measurements of the posterior compartment.<sup>35</sup> However, one study demonstrated that a widened ARA is associated with obstructive defecation symptoms and a narrow levator plate descent angle is associated with obstructive defecatory symptoms.<sup>42</sup> When compared with fluoroscopic defecography, transperineal ultrasound findings were comparable with a high degree of concordance.<sup>43,44</sup> Ultrasound and MRI findings have been shown to be comparable when assessing levator ani muscles,<sup>42</sup> but to date, there is no study specifically correlating MRI with ultrasound assessment of the posterior compartment.

Ultrasound technology is an evolving modality in the assessment of pelvic floor defects. Standardization of imaging is challenging because ultrasonography imaging acquisition is operator dependent and because of variation in ultrasound technology.

## SUMMARY

Multiple studies suggest that although defecatory symptoms are often associated with POP, the pathophysiology may be different and related to the abnormalities in the anorectal anatomy more than the vaginal topography. There is little relationship between symptoms and POP-Q values. In most studies, imaging and POP-Q values have no significant relationship and there is no standardized radiologic prolapse grading system. The finding of a posterior vaginal prolapse or anorectal pocketing on physical examination is not specific or related to the severity of obstructive defecatory symptoms<sup>45</sup> and is a common finding in asymptomatic women. Likewise, the radiologic diagnosis of rectocele has not been shown to correlate with defecatory symptoms and is also a common finding in healthy, asymptomatic women.<sup>30</sup>

No specific imaging finding is sensitive and specific for obstructed defecation syndrome. The role of imaging in the diagnosis of defecatory dysfunction is not well established. Furthermore, abnormalities seen on imaging should be interpreted with caution because the data concerning normal values for some parameters are not well established, and there is substantial overlap between findings in symptomatic women and normal volunteers. Defecatory imaging studies in healthy volunteers reveal radiologic features that are considered pathologic. Because of this, treatment decisions should be based on symptoms rather than findings on

imaging. Imaging should be reserved for cases in which gastrointestinal dysfunction is suspected or the history is unclear or not consistent with examination findings.

Obstructed defecation and the associated symptoms and signs may be consequences of gastrointestinal dysfunction rather than the cause. Therefore, evaluation of gastrointestinal function is paramount in the treatment of defecatory dysfunction because the surgical repair addresses the defect in the anatomy, not its underlying cause.

## SUMMARY AND RECOMMENDATIONS

- No specific symptom, physical examination finding, or imaging finding is sensitive and specific for obstructed defecation.
- Treatment decisions should be based on symptoms rather than findings on imaging.
- In most women with bulge symptoms and posterior vaginal wall prolapse, no imaging is required before surgery.
- Imaging may be most helpful in cases in which symptoms do not match physical examination findings (eg, defecography can show dyssynergic pelvic floor contractions in a woman with defecation dysfunction).
- Anterior rectoceles seen on imaging that are not symptomatic do not need treatment.
- Small bowel in the posterior cul-de-sac (enterocele) is found in healthy, asymptomatic women and should not be considered pathologic.
- MRI, ultrasound, and fluoroscopy defecography provide functional studies of pelvic organs.
- Imaging studies of defecation are most physiologic when done in a sitting position.
- MRI is the best modality to visualize soft tissue injury.
- Slow-transit constipation should be ruled out in patients with infrequent bowel movements, refractory to laxative or other conservative measures.
- Patients with a recent and persistent change in bowel habits, excessive straining or a sense of incomplete evacuation, abdominal pain, rectal bleeding, weight loss, and anemia have risk factors for colorectal cancer and warrant endoscopic gastrointestinal evaluation.

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