



Radiology Rounds

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Evaluation of Pelvic Floor Dysfunction by Defecography

- Defecography is a dynamic fluoroscopy examination that is valuable for patients with pelvic floor disorders, primarily constipation and certain forms of fecal incontinence
- Defecography can show anatomical causes of obstruction including rectal intussusception, rectocele, enterocele, sigmoidocele, and paradoxical contraction of the puborectalis muscle

Symptomatic pelvic floor disorders are common in women, occurring in about 24% of all women over 20 years. The proportion is higher after childbirth, with increasing age, and in obese women. Pelvic floor disorders are relatively uncommon in men but may occur after radiation treatment or surgery for prostate cancer. Problems associated with pelvic floor dysfunction are quality of life issues that can often be treated by surgical or behavioral training when properly diagnosed. The list of pelvic floor disorders is considerable (Table 1) and it is common for patients to have more than one. Several of these, including internal rectal intussusception, enteroceles, sigmoidoceles, rectoceles, or the inability to relax the puborectalis muscle can result in constipation due to outlet obstruction. In these cases, patients describe straining during at least 30% of defecations and often experience the sensation of incomplete evacuation and may use manual maneuvers to facilitate evacuation.

Defecography can be a useful imaging test for patients who present with symptoms of outlet obstruction because it can help diagnose the cause of constipation and direct the patient to the most appropriate therapy. Results from a questionnaire indicated that clinicians found defecography of major benefit in 40% of cases and changed management from surgical to medical in 14% and vice versa in 4%. Defecography is a dynamic fluoroscopic examination conducted during rectal evacuation of a barium paste while the patient is seated on a specially designed commode. It is considered to be superior to MR imaging because it is conducted in an upright position, which is both more comfortable for the patient and more accurately simulates the natural process of defecation. It can be diagnostic for internal rectal intussusception which, unless it is very severe, cannot be diagnosed by physical examination. It can be used to measure rectoceles, which are common in women and are not considered abnormal unless they are >4 cm. Sequestration of stool within a rectocele results in a feeling of incomplete evacuation and the need to strain more or use digital or other strutting maneuvers to

Table 1. Pelvic Floor Disorders

Fecal Incontinence
Constipation
Rectal Prolapse
Rectocele
Cul-de sac Hernias:
-Enterocele
-Sigmoidocele
Perineal Descent Syndrome
Vaginal Prolapse
Cystocele

complete emptying. Oral contrast in the small bowel may show the presence of an enterocele or sigmoidocele. The position of the pelvic floor at rest and during evacuation can be measured in relation to bony landmarks.

Defecography is also diagnostic of functional disorders of evacuation. Some patients suffer constipation because of an inability to coordinate the necessary voluntary and involuntary muscles. In particular, some patients paradoxically contract, as opposed to relax, the puborectalis muscle during evacuation. Contraction and relaxation of this muscle results in an angle between the rectum and anus, which can be measured during defecography. During normal defecation, relaxation of the puborectalis muscle results in straightening of this angle, which does not occur in patients with paradoxical puborectalis contraction.

Patient Preparation

Although defecography can be embarrassing for many patients, a thoughtful and caring technologist can help them tolerate it easily. In order to allay anxiety, the radiologic technologist will fully explain the procedure and reassure the patient. The technologist will also ask women about the number of vaginal deliveries, whether they had an episiotomy or pelvic surgery, and whether they have any other symptoms of pelvic floor dysfunction.

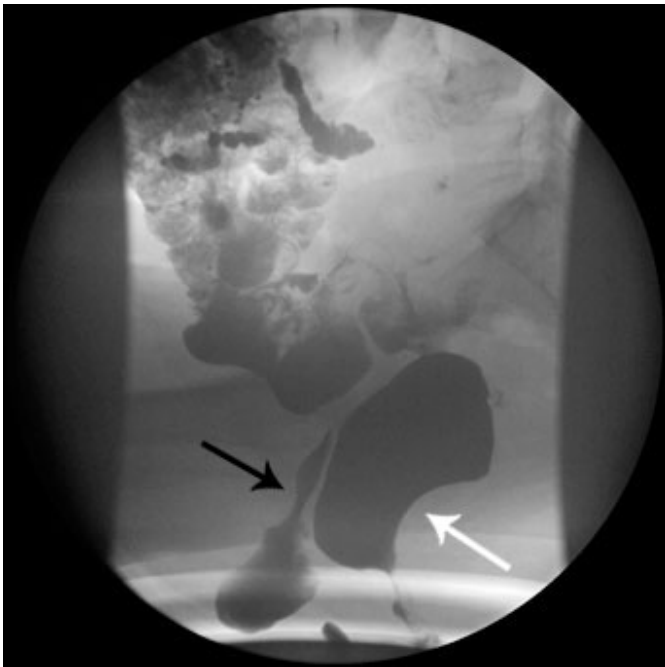


Figure 1. A normal pre-evacuation image from a defecography examination of a patient complaining of constipation and the inability to completely evacuate. The black arrow shows contrast material in the vagina. The white arrow shows contrast in the rectum. Contrast material is also seen in the small bowel.

The patient has a Fleet enema prior to arrival in the department. When the patient arrives, they are given 240 cc of liquid barium to drink in order to opacify the small bowel so that an enterocele can be detected, if present. In order to confirm that the barium has reached the colon before the examination, a scout abdominal radiograph is done after 1 hour.

The Defecography Examination

The procedure requires rectal opacification with barium paste and, in women, opacification of the vagina. First, the patient is positioned on his or her left side on the fluoroscopy table. If the patient is a woman, 10 cc of barium cream is inserted into the vagina using a catheter syringe. Then approximately 400 cc of rectal barium contrast, a thick paste with the consistency of stool, is inserted into the rectum. In women, a barium pill is taped to the perineum between the vagina and rectum. The patient climbs onto a specially designed radiotranslucent commode, positioned next to an upright fluoroscopy table.

A single image is acquired when the patient is at rest, after which the patient is asked to strain but hold in the contrast material while a second image is acquired. Then the patient is asked to try to evacuate the rectum. Defecography images are acquired during pulsed fluoroscopy at a rate of 1 per second for 30 seconds or as needed. If contrast material remains in the rectum, the patient is asked to try again, using finger manipulation or another method to aid evacuation if that is what they normally do, and dynamic fluoroscopy is repeated. The complete examination takes approximately 15 minutes. Although

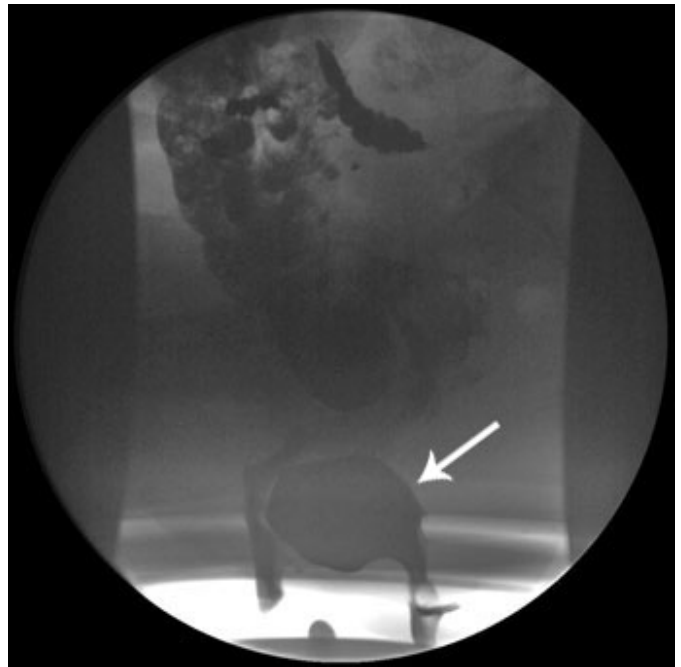


Figure 2. Defecography image of the same patient after attempted evacuation. A large anterior rectocele (arrow) has formed and retains contrast material.

the radiation dose is a concern, especially when imaging younger patients, the total radiation dose is less than that of a barium enema or a GI series.

Scheduling

Patients who complain of symptoms that are consistent with outlet obstruction should be evaluated by a gastroenterologist, a colorectal surgeon, or both. Concomitant symptoms of pelvic organ prolapse may be present, and these should be evaluated by a urogynecologist. At the Massachusetts General Hospital, members of these specialties work together as a multidisciplinary team in the Pelvic Floor Disorders Service. These specialists examine the patient and perform tests such as manometry and balloon expulsion testing in order to select patients most likely to benefit from defecography. Patient and provider information regarding pelvic floor disorders, their evaluation and treatment is available on the [Pelvic Floor Disorders Service website](#). The Pelvic Floor Disorders Service Access Nurse can be reached for further questions about pelvic floor disorders in general and regarding appropriateness of scheduling a defecography for a particular patient at **617-643-5580**.

Note that the weight limit of the fluoroscopy table is 350 lb. Patients weighing less but with very wide hips may not fit between the x-ray tower and the table (20 inches wide).

Defecography examinations are performed at the main campus on Ellison 2. They can be ordered by calling Maureen Seluta, Operations Manager at **617-724-7438**.

Further Information

For further questions on defecography, please contact [Deborah A. Hall, M.D.](#), Abdominal Imaging and Interventional Radiology at **617-726-3093**.

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