Work-Up of the Constipated Patient

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ABSTRACT

Constipation is a common problem. Evaluation of patients should include a detailed history and clinical examination followed by radiologic and physiologic testing. The order of testing is dependent on patient symptoms and physician preference. The options are described along with their limitations.

KEYWORDS: Constipation, evaluation, transit studies

Objectives: Upon completion of this article, the reader should be familiar with the work-up of constipated patients.

Constipation is one of the most common self-diagnosed and self-treated gastrointestinal disorders in the United States and frequently can be alleviated by increasing fluid and fiber intake. Constipation can be defined as infrequent bowel action, hard dry stools, or straining to evacuate. Large studies have shown that normal bowel frequency ranges from three bowel movements per day to three per week.¹⁻³ It is generally accepted that patients who have less than three bowel movements per week are outside the normal range and are considered constipated.⁴ Patients, however, may define constipation differently than do their physicians and many with normal frequency consider themselves constipated because of straining, incomplete evacuation, painful movements, or dry consistency.⁵

Constipation is technically not a disease, but occurs as a result of numerous causative factors. The differential diagnosis includes the use of medications that have constipating side-effects, or medical conditions that mechanically or functionally alter bowel function.⁶ Many elderly patients are on a combination of medications and there may be an association between the number of medications taken by patients and their report of constipation.⁷ Aluminum and calcium antacids, diuretics, sucralfate, β blockers, calcium channel blockers,

ganglionic blockers, anticholinergics, opiates, and tricyclic antidepressants are commonly implicated medications.

Medical conditions that are associated with constipation either impede transit mechanically or slow transit neurologically. Mechanical causes such as neoplasms, inflammatory bowel disease, diverticular disease, and intestinal volvulus alter bowel function by causing partial or occasionally total obstruction. These diseases should be considered when evaluating a patient with complaints of sudden onset or recent constipation. Patients with near obstructing colorectal carcinoma may say that they are constipated because the process of elimination has gotten harder, but that the actual number of bowel movements increased. Constipation associated with diverticulitis is often accompanied by the complaint of left lower quadrant pain. Not all patients with severe narrowing of the sigmoid colon due to hypertrophy secondary to diverticular disease have associated fever and chills. The constipation associated with recurrent sigmoid volvulus can be intermittent and is frequently associated with massive abdominal distension. The diagnosis of aganglionosis of the colon (Hirschsprung's disease) may be delayed in patients with very short aganglionic segments in the distal rectum. These

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patients may present during adolescence or early adulthood with long histories of irregular bowel habits.

Functional causes of constipation include medical illnesses (metabolic, endocrine, and neurologic disorders) and dysfunction of the pelvic floor musculature (internal intussusception, rectocele, and anismus). Hyperparathyroidism (causing hypercalcemia) and other electrolyte disorders (hypokalemia) may cause constipation. Breath H₂ excretion tests show slow transit to the colon in patients with hypothyroidism.⁸ These findings were reversible when the patients were treated with replacement hormone. Diabetes may cause constipation due to an autonomic neuropathy. Neuromuscular disorders as well as central and peripheral neuropathies are associated with constipation. Scleroderma is a systemic disease affecting the small and large bowel causing diarrhea, constipation, and intestinal pseudo-obstruction. Noncompliance of the bowel wall secondary to muscle atrophy and fibrosis or neurological involvement may account for the symptoms associated with scleroderma.⁹⁻¹¹ Constipation associated with multiple sclerosis may be due to a loss of postprandial increase in colonic motor and myoelectrical activity as a result of a visceral neuropathy.¹² Spinal cord lesions or injuries causing paraplegia or quadriplegia are associated with a combination of constipation and fecal incontinence.^{13,14} High cord lesions lead to a decrease in motility causing colonic inertia. Low cord lesions lead to a loss of inhibitory influences leading to a decreased compliance and left colon transit time.

Pelvic floor abnormalities should be included in the differential diagnosis of patients with constipation. This group of disorders includes nonrelaxing puborectalis muscle (anismus), internal intussusception, rectal prolapse, and rectocele. The etiology of these abnormalities is unclear. Dysfunction and discoordination of the pelvic floor muscles is one of the more reasonable explanations.^{15,16} Complaints associated with these conditions are of incomplete and difficult evacuation, pelvic pain, and the worsening of the condition with straining.

Psychiatric conditions such as depression and dementia have been associated with constipation, but it is likely that the role of medications in these conditions is great.^{3,5,17} It has been suggested that some forms of constipation may be related to psychologically traumatic events such as sexual or physical abuse during childhood or other personality disorders.¹⁸

WORK-UP

A detailed history and clinical examination is fundamental in the evaluation of patients with constipation because self-reported constipation may not reliably identify patients with functional constipation.^{5,19,20} Accurate evaluation of patients with constipation is critical to rule out conditions that would require immediate attention

and to ensure that appropriate medical and surgical management is offered to the patient with refractory symptoms. The initial evaluation should begin with a thorough history and physical examination. Patients should be asked to define what they mean by constipation and whether this is a new or chronic problem. Because patients and their doctors may define constipation differently, it is imperative to get the patient to describe their specific symptoms and how they are affected by them.

A detailed bowel history should include the frequency and consistency of bowel movements, ease of evacuation, and length of time symptoms have occurred. The need to strain and perform digital maneuvers (rectal, vaginal, and perineal) should be noted. The patient's current and prior use of stool softeners, laxatives, suppositories, enemas, and other over-the-counter medications should be noted. Dietary habits including the amount of fiber and fluid intake should be included in the history. Patients should be questioned specifically about urinary symptoms and vaginal prolapse because many of these conditions can occur concurrently. Medical illnesses and all medications (prescription and over-the-counter) should be listed. Prior surgical history, particularly pelvic and anorectal surgery is important as is the history of spinal surgery or trauma prior to the onset of symptoms. Although often difficult to do, patients should be questioned regarding physical and sexual abuse.

A digital rectal examination is done to exclude low rectal cancers, anal strictures, and other anorectal abnormalities. Increased anal tone and pain should be noted as some patients with severe fissures can present with new onset constipation. Proctosigmoidoscopy may identify a solitary rectal ulcer or anterior erythema, which indicates internal intussusception or rectal prolapse. Having the patient strain during the rectal examination or during proctosigmoidoscopy may identify a mobile, intussuscepting rectum. It may be necessary to have the patient strain on a toilet to identify those patients with complete rectal prolapse, cystoceles, and possible enteroceles. Complete evaluation of the colon should be performed by colonoscopy, air contrast barium enema, or virtual colonoscopy to ensure that there are no mechanically obstructing lesions. Even in young patients these tests may be helpful in determining a more proximal source of constipation and should be considered especially if the history of constipation is short or the normal bowel pattern has recently changed. Most patients with chronic constipation, however, will have a normal examination of the colon and rectum.

Radiologic and physiologic testing should be considered if symptoms persist despite dietary and medical alterations. The order of testing is dependent on patient symptoms and physician preference. Constipation can be broken down loosely into several categories: abnormal transit (colonic inertia), pelvic

floor abnormalities (rectal intussusception), and evacuation disorders (paradoxical contraction of the puborectalis). Some patients have overlapping symptoms and findings. Symptoms alone do not identify pathophysiology or differentiate subgroups of patients with constipation. Imaging plays a role in distinguishing structural from functional causes of constipation although no single test adequately defines the pathophysiology of constipation.²¹ Patients with colonic inertia typically complain of the inability to have a bowel movement without the use of laxatives. These patients can often go weeks without a normal bowel movement or even the sensation to defecate. Colonic transit times are usually performed first if the primary complaint is infrequent defecation. Patients with pelvic floor abnormalities often complain of straining to have a bowel movement, fragmented bowel function, and pelvic pressure. Defecography characterizes rectal evacuation and puborectalis contraction and is useful in the evaluation of evacuation disorders. The need for digital maneuvers is common in patients with paradoxical contraction and symptomatic rectoceles. Balloon expulsion and electromyography (EMG) recruitment may be helpful to identify functional defecation problems whose symptoms might respond to physical therapy. Anal manometry and EMG may be useful if adult Hirschsprung's disease is suspected or if the patient has additional symptoms of fecal incontinence.

Colonic transit times are easily performed and are done to establish the diagnosis of colonic inertia.^{22,23} The patient is placed on a high-fiber diet and needs to refrain from taking laxatives and enemas during the examination period. A capsule with radiopaque markers is taken orally on day zero and plain abdominal radiographs are taken on days 3 and 5. The number of remaining markers is counted and their position noted. Colonic inertia is considered if > 20% of the radiopaque rings are scattered throughout the right, transverse, and left colon by the fifth day. Outlet obstruction, usually due to nonrelaxing puborectalis muscle or internal intussusception, will result in normal transit of the rings to the rectum by the third day. Poor emptying of the rectum however, results in retention of rings within the rectal ampulla and sigmoid colon by the fifth day. Noncompliance, diarrhea, and error in taking the capsule may give a falsely normal examination. Gastric emptying and small bowel transit has been shown to be abnormal in patients with chronic constipation, but these tests are not routinely performed unless the index of suspicion is high.²⁴

Pelvic floor outlet obstruction may be difficult to distinguish from colonic inertia and it is possible that the two diagnoses exist simultaneously. Defecography evaluates voluntary rectal evacuation and is used to delineate defecation dynamics.²⁵ Thickened barium is placed into the patient's rectum and a continuous recording of the patient's efforts to cough, strain, and defecate is taken.

The vagina is marked with thin barium and markers are placed on the perineal body to better assess rectoceles, enteroceles, and pelvic descent. The five criteria for normal evacuation are outlined by Mahieu.²⁶ There should be an increase in the anorectal angulation with straining, obliteration of the puborectalis impression, widening of the anal canal opening, total evacuation of the rectal contrast, and normal pelvic floor resistance. Loss of fixation of the rectum to the sacrum allows the rectum to descend into the pelvis resulting in various degrees of internal intussusception. Internal intussusception of the rectum can block the rectal outlet resulting in incomplete evacuation of the rectal contrast. Intussusception is, however, a common finding in asymptomatic patients and radiological findings should be correlated with patient's symptoms. Symptomatic patients will frequently have more advanced findings than asymptomatic patients.²⁷ Obstructed defecation by a nonrelaxing puborectalis muscle during straining to evacuate the rectal vault may also be seen.²⁸ Full rectal prolapse may be demonstrated by defecography if the patient is unable to reproduce it in the office. Radiologic findings, however, must be interpreted within the context of the clinical presentation.

Defecography visualizes pelvic floor motion during simulated defecation by dynamic "imprinting," but is unable to detect soft tissue structures. Some centers have evaluated the use of dynamic magnetic resonance imaging (MRI) in an effort to decrease the radiation dose and better visualize the musculature of the pelvic floor in patients with pelvic floor abnormalities.²⁹⁻³¹ Early methods were hindered by the need to keep the patients in a supine position, which is unnatural for defecation. Vertical open MRI systems do exist and can be used to better understand the relationship of the pelvic viscera to each other during straining. A comparison between dynamic MRI and defecography was recently published; the authors found no clinical advantage, but the cost of an MRI scan was significantly higher.³²

Anal manometry has limited value in the workup of constipation. Resting and squeeze pressures are usually normal unless another cause for injury has occurred or prolonged straining has caused a stretch injury of the pudendal nerve.³³ Decreased rectal sensation documented by high minimal sensory rectal volumes may be found in patients with megarectum. The rectal anal inhibitory reflex is absent in the setting of Hirschsprung's disease and may also be absent in patients with megarectum who require large volumes to induce the inhibitory reflex.

EMG is useful in the evaluation of constipation particularly for those patients who complain of prolonged straining and for patients who may have early signs of incontinence. Several EMG techniques have been described utilizing needles, intranal sponge, and surface electrodes. Concentric needle EMG measurement of puborectalis activity during straining was proposed as a

diagnostic tool to determine nonrelaxing puborectalis as a cause of outlet obstruction.¹⁶ This technique involves insertion of thin needles directly into the external anal sphincter. Recordings are made with the patient at rest, during active squeeze and push phases. Activity should increase during the squeeze and decrease during the relaxation/push phase. An increase in activity during the push phase is seen in patients with paradoxical contraction of the puborectalis. Patient tolerance of this technique limits its usefulness however. The presence of a needle within the puborectalis muscle may itself cause the patient to contract the puborectalis muscle during attempts to defecate. In addition, paradoxical contraction of the puborectalis muscle in disorders other than obstructed defecation limits the use of this test.³⁴ Other EMG techniques have been evaluated for accuracy and patient comfort. Good correlation between surface and needle EMG has been shown to occur in the evaluation of patients with paradoxical contraction of the puborectalis.³⁵ Similarly, intra-anal sponge electrodes are well tolerated by patients and results correlate with needle electromyography.³⁶

The failure to expel a latex balloon filled with 60 to 100 cc of saline or air is an important indicator of disordered defecation.^{16,37} A review of patients with nonrelaxing puborectalis muscle revealed that all patients with this cause of outlet obstruction were unable to expel a balloon in the sitting position.³⁸ Patients who had prominence of the puborectalis muscle on defecography, but who were able to expel a rectal balloon responded to increase in dietary fiber. Only patients with nonrelaxation of the puborectalis muscle demonstrated by defecography and inability to expel a rectal balloon had true disordered defecation and required further treatment.

If underlying psychological problems are suspected, the patient should undergo a psychologic profile followed by counseling if necessary. Patients with normal transit constipation have been found to have higher psychiatric distress scores than those with slow transit constipation.³⁹ It has been suggested that patients with normal transit constipation may have misperceptions of normal bowel habits and that psychological counseling may contribute to the alleviation of symptoms of constipation. The Hospital Anxiety and Depression (HAD) questionnaire was used to evaluate patients prior to surgical treatment for chronic constipation.¹⁷ Patients who had poor surgical outcome had high preoperative HAD scores suggesting that a more thorough psychiatric assessment might have been beneficial prior to surgery.

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