

A Clinical Approach to Constipation

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The economic impact of constipation is large. The condition prompts an estimated 2.5 million physician visits per year, with 100,000 referrals to gastroenterologists. Almost all (85%) of these physician visits result in a prescription for a laxative. Each year, Americans spend ~\$800 million on laxatives. For patients referred for diagnostic evaluation, the average cost is ~\$3000, mostly due to the cost of colonoscopy. This article discusses the pathophysiology of constipation and presents a practical approach to evaluating and treating this disorder.

DEFINITION

Constipation is a common complaint heard in clinical practice. While prevalences as high as 20% have been quoted, the true prevalence is difficult to gauge precisely because of the difficulty in defining exactly what constipation is. The word “constipation” comes from the Latin “constipare,” which means “to crowd together,” a term the Romans used as meaning “to pack anything tightly.” It was not until the 16th century that the word “constipation” came to mean “in-spissated stool packed tightly in a dilated colon.”

Physicians usually define constipation as “an inadequate stool frequency of less than 3 per week.” This lower limit of normal was defined in population surveys of subjects eating a Western diet. It is clear this definition in and of itself is inadequate because patients often define constipation as “difficulty in passing a stool, or a hard or lumpy stool consistency.” A better definition can be found in “Rome II: A Multinational Consensus Document on Functional Gastrointestinal Disorders.” The expert panel that wrote this document was originally convened in Rome to define functional disorders, such as irritable

KEY POINT

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bowel syndrome, and this document was updated in 1999. Functional constipation is suspected in a patient with 12 weeks of symptoms that may include either a decreased stool frequency or difficulty in stool passage with a hard stool consistency (**Table I**).

Various risk factors for constipation have been identified. Women report constipation more often than men do, and older patients more often than younger patients. Constipation is associated with inactivity, low calorie intake, the number of medications being taken, low income, and low education level. It is also associated with psychologic risk factors, such as clinical depression or a history of physical or sexual abuse. Interestingly, specific dietary factors, such as a low intake of fiber, have not been reported.

TABLE I. DIAGNOSTIC CRITERIA FOR FUNCTIONAL CONSTIPATION

At least 12 weeks, which need not be consecutive, in the preceding 12 months of 2 or more of the following:

- Straining in >1 out of 4 defecations
- Lumpy or hard stools in >1 out of 4 defecations
- Sensation of incomplete evacuation in >1 out of 4 defecations
- Sensation of anorectal obstruction/blockade in >1 out of 4 defecations
- Manual maneuvers to facilitate >1 out of 4 defecations (eg, digital evacuation, support of pelvic floor)
- <3 defecations/week

Loose stools are not present, and there is insufficient criteria for irritable bowel syndrome.

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PATHOPHYSIOLOGY

The pathophysiology of constipation can be classified as structural or functional abnormalities. Structural abnormalities cause constipation by obstructing the flow of feces. While the presence of a malignant neoplasm is the most serious concern, obstruction leading to symptoms of constipation may be caused by a benign neoplasm (eg, lipoma or leiomyoma), an inflammatory stricture (eg, diverticulitis, inflammatory bowel disease, postschismic injury), or adhesions. Patients often have other clinical signs, such as distension, vomiting, weight loss, bleeding, or a narrowing of the stool caliber. In only a small minority of patients complaining of constipation is the cause obstruction.

In the majority of patients, constipation is functional due to disordered motility of the colon or anorectum. Functional constipation can be subclassified as primary or secondary, depending on whether an underlying cause is present, such as a systemic illness or the side effect of a medication. The most common medications that cause constipation are anticholinergics, analgesics, neurally acting agents such as opioids and antihypertensives, and cation-containing compounds such as iron supplements and calcium preparations (Table II). Systemic illnesses (Table III) may cause constipation from metabolic derangements (eg, thyroid disease or diabetes); destruction of gut muscle (ie, systemic sclerosis); or neurologic disease, which may be either central (eg, multiple sclerosis or spinal cord injury) or peripheral (eg, Hirschsprung's disease).

In many if not most patients an underlying cause is usually not found. Primary functional constipation is then diagnosed. These patients generally have 1 of 2 disorders of colorectal motility: slow-transit constipation (colonic inertia) or pelvic floor dysfunction (outlet obstruction). In slow-transit constipation, there is a prolonged time of passage of feces from cecum to rectum, which may be due to the absence or diminution of propagating peristaltic contractions or uncoordinated motor activity in the distal colon that may form a functional barrier to the passage of feces. In pelvic

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floor dysfunction, there is an inability to pass feces that have collected in the rectum. The mechanisms involved in defecation are complex and the specific abnormalities poorly understood. It seems likely that in many of these patients there is a failure of the puborectalis or the external anal sphincter to adequately relax during defecation. In patients

TABLE II. DRUGS ASSOCIATED WITH CONSTIPATION

<i>Class</i>	<i>Example</i>
<i>Anticholinergics</i>	
• Antidepressants	Amitriptyline
• Antiparkinson drugs	Benzotropine
• Antipsychotics	Haloperidol
• Antispasmodics	Dicyclomine
<i>Analgesics</i>	
• Nonsteroidal anti-inflammatory drugs	Ibuprofen
<i>Neurally acting agents</i>	
• Adrenergics	Clonidine, ephedrine, terbutaline
• Anticonvulsants	Phenytoin
• Antihistamines	Diphenhydramine
• Antihypertensives	β-blockers, diuretics
• Calcium channel blockers	Verapamil
• Opiates	Morphine, codeine, loperamide
• Vinca alkaloids	Vincristine
<i>Cation-containing agents</i>	
• Aluminum	Antacids
• Barium sulfate	Oral contrast agents
• Calcium	Antacids, supplements
• Iron supplements	Ferrous sulfate

with pelvic floor dysfunction, a rectocele may be present.

Marker studies (Sitzmarks[®], Konsyl Pharmaceuticals, Inc., Fort Worth, Texas) are useful in discriminating between these 2 motility disorders. Radiopaque markers are ingested and abdominal radiographs are obtained 4 to 7 days later. Patients with normal motility pass the majority (>80%) of the markers within 5 days. Retention of markers distributed throughout the colon indicates colonic hypomotility, whereas collection within the rectum indicates a functional outlet obstruction (**Figure 1**).

CLINICAL EVALUATION

The initial evaluation should focus on elucidating whether there is an underlying cause for the constipation (**Figure 2**). Removal of the cause, either by eliminating a causative medication or treating an

underlying illness, may resolve the problem. The medical history and the physical examination should focus on the presence of underlying systemic and neurologic illnesses (**Table III**). Laboratory tests should include a complete blood cell count; electrolytes, including calcium, phosphorus, and magnesium; blood urea nitrogen; creatinine; and glucose and thyroid function tests, with additional specialized blood tests as dictated by findings of the medical history and physical examination. A careful medication history should be taken that includes both prescription medications and any over-the-counter or herbal products the patient may be using. Polypharmacy can be a significant problem, and often the best approach is to instruct patients to empty the contents of their medicine cabinets into a paper bag and bring them to their next appointment. This approach is especially useful for elderly patients or patients who may be

TABLE III. SECONDARY CAUSES OF CONSTIPATION*Metabolic disorders*

- Diabetes mellitus
- Heavy metal poisoning
- Hypercalcemia
- Hypokalemia
- Hypomagnesemia
- Hypopituitarism
- Hypothyroidism
- Pheochromocytoma
- Porphyria
- Pregnancy
- Uremia

*Neurogenic disorders**Central*

- Cerebrovascular disease
- Multiple sclerosis
- Parkinson's disease
- Shy-Drager syndrome
- Spinal cord injury

Peripheral

- Autonomic neuropathy
- Hirschsprung's disease
- Neurofibromatosis

Collagen vascular and muscle disorders

- Amyloidosis
- Dermatomyositis
- Myotonic dystrophy
- Systemic sclerosis

confused about exactly what medications they are taking. Psychologic factors should also be assessed.

Of chief concern to patients and physicians is a possible underlying malignancy or other obstructing process. Symptoms may include abdominal distension, weight loss, vomiting, change in stool caliber, bleeding, and anemia. Patients should be reassured that the symptoms of constipation are common and the likelihood of cancer as its cause is very low.

The examiner should ask about specific features of the constipation and determine the onset and duration of symptoms. Onset in childhood suggests the possibility of a congenital disorder, such as Hirschsprung's disease (a congenital absence of ganglionic cells in the rectum). A recent change in bowel habit suggests an organic disorder, whereas that of several years' duration suggests a functional complaint. What feature does the patient find most distressing? Is it the infrequent passage of stool or straining or other maneuvers required for evacuation? Straining (the need for perineal pressure) or digital extraction of stool suggests perineal dysfunction. If the major complaint is of symptoms between evacuations, such as

cramps and bloating, then irritable bowel syndrome should be suspected and may be constipation predominant. The use of laxatives, enemas, and suppositories should be noted.

In addition to looking for organic causes, a neurologic examination should be performed. The abdomen is examined for evidence of not only masses and organomegaly but also surgical scars. Anorectal and perineal examinations are performed to search for perineal disease or deformity. An anal fissure may be either a cause or a result of constipation. The fissure may be seen by spreading the buttocks and using a bright examining light or may be found by pain elicited during digital examination. A careful digital examination assesses for a mass, anal canal stricture, or impacted stool. Instructing the patient to squeeze the examining finger assesses external anal sphincter and puborectalis function; a lack of voluntary squeeze suggests a neurologic problem. Perianal sensation to light touch should be assessed. Reflex contraction of the anal canal after pinprick of the perianal area (ie, anal wink) also can be used to test neurologic function. When the finger is removed, gaping of the anal canal further suggests a neurologic problem. Instructing the patient to strain may reveal rectal

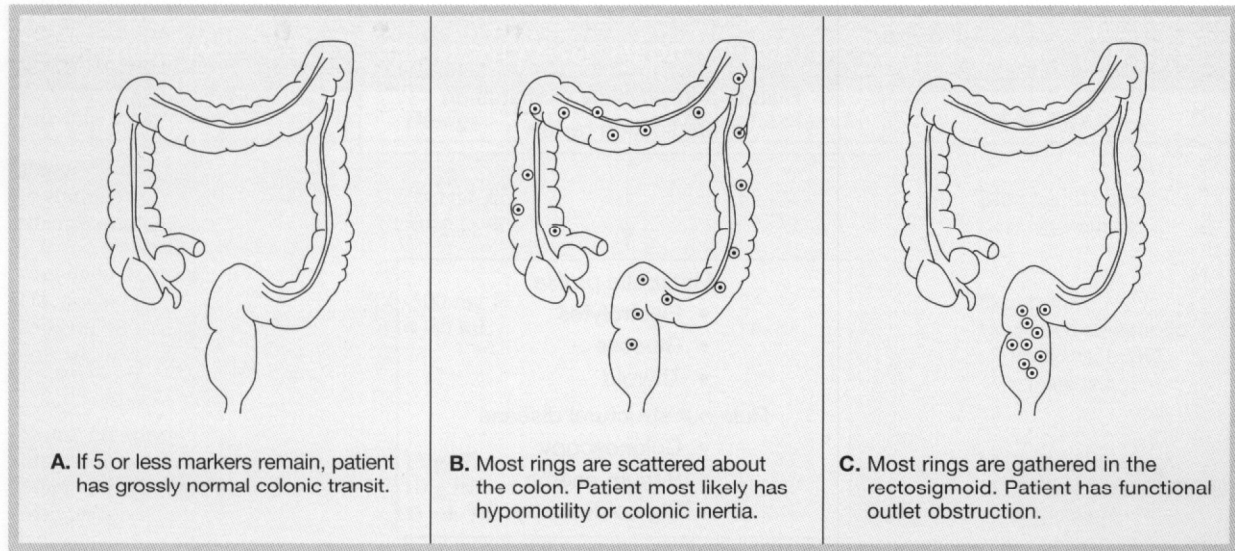


Figure 1. Markers are ingested on Day 0. The patient is instructed to use no laxatives, enemas, or suppositories for 5 days. Abdominal radiographs are obtained on Day 5. The pattern of marker retention helps differentiate between normal (A), colonic hypomotility (B), or a functional outlet obstruction (C). Reprinted with permission from Sitzmarks [brochure]. Fort Worth, Tex: Konsyl Pharmaceuticals, Inc.; 1999.

prolapse, perineal descent, or bulging of a rectocele into the vagina. A stool specimen may be tested for occult blood.

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DIAGNOSTIC TESTS

The primary goals of diagnostic testing are to rule out a secondary cause of constipation, such as obstruction, and to aid in therapy. Visualization of the colonic lumen should be done in patients where colonic obstruction is suspected and in patients >50 years of age who have not previously undergone colon cancer screening. Visualization may be done with either flexible sigmoidoscopy, colonoscopy, or barium enema. Colonoscopy has been shown to be

superior to barium enema for the detection of cancer, but whether it is superior in the evaluation of constipation has not been demonstrated. Barium enema may also occasionally miss a distal rectal mass; for this reason, flexible sigmoidoscopy is often performed in addition to the barium enema. The presence of a solitary rectal ulcer indicates rectal prolapse.

Studies of colorectal motility may be useful in patients with severe refractory symptoms. Marker studies may help to distinguish normal from slow-transit and outlet-obstructive constipation (**Figure 1**).

Anorectal manometry measures sphincter pressures, autonomic reflex pathways, and sensation. In the resting state, a basal sphincter pressure is maintained by the smooth muscle of the internal anal sphincter. In response to rectal distension (by a balloon), this muscle should reflexively relax. If it does not, this may indicate Hirschsprung's disease in which a congenital absence of intramural ganglion cells leads to the loss of internal anal sphincter relaxation, resulting in outlet obstruction of feces. Confirmation of Hirschsprung's disease requires deep biopsies of the rectal wall to demonstrate the absence of neurons. The external anal sphincter, which is composed of voluntary striated muscle, is assessed by anorectal manometry and is done by asking the patient to squeeze the anal probe. A high resting

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