

**EDY E. SOFFER MD**Department of Gastroenterology-Hepatology,
The Cleveland Clinic

Constipation: An approach to diagnosis, treatment, referral

ABSTRACT

When a patient reports constipation, a careful history and physical examination may identify the underlying cause. In many patients, though, no underlying cause is identified. Empiric treatment with exercise, hydration, fiber supplementation, and mild laxatives is often effective. If constipation does not resolve with these measures, then the physician may refer the patient for further testing for slow colonic transit, pelvic floor dysfunction, or anatomical defects, and in difficult and recalcitrant cases for surgical treatment.

KEY POINTS

A detailed history is the most important part of the initial diagnostic evaluation of constipation.

Ask patients about medications they are taking, since medications such as anticholinergics, narcotics, and antidepressants may cause constipation.

A four-step empirical approach to treatment is usually appropriate at first.

A small minority of patients will not be relieved by empiric treatments and should be referred for specialized testing.

WHEN A PATIENT reports constipation, a careful history and physical examination performed by the primary care physician are usually sufficient to identify any underlying cause, although in most patients no such cause can be found.

This article outlines an approach to the diagnosis and treatment of constipation, as well as what happens when patients with severe, treatment-resistant constipation are referred for additional testing.

THE PREVALENCE OF CONSTIPATION

In adults, constipation is more prevalent in the elderly than in the young, and young to middle-aged women are much more likely to report it than are men. Nationwide surveys put the prevalence of constipation in the general population at 2% to 12.8%, based on a range of subjective complaints.^{1,2} A recent survey based on definite criteria³ found a prevalence of 3%.⁴

DEFINING CONSTIPATION AND IDENTIFYING THE CAUSE

Constipation is not a disease, but rather a symptom. As such, it is interpreted subjectively by the patient. Patients' complaints of constipation vary, and misconceptions about bowel habits are common and may lead patients to falsely assume they have constipation. Patients may also complain of nausea and abdominal pain associated with less frequent bowel movements.

Misconceptions about bowel habits

Bowel habits in healthy adults vary widely. The frequency of bowel movements, for exam-

TABLE 1

Causes of chronic constipation**Mechanical**

Neoplasms
Rectal intussusception or prolapse
Rectocele

Functional

Irritable bowel disease

Pharmacologic

Anticholinergics
Antidepressants
Antiparkinsonian agents
Calcium-channel blockers
Iron supplements
Opiates

Metabolic and endocrine

Diabetes
Hypercalcemia
Hypothyroidism

Neurogenic

Aganglionosis (Hirschsprung disease)
Intestinal pseudo-obstruction
Multiple sclerosis
Parkinson disease

If history and examination fail to identify one of the above causes, then consider:

Slow colonic transit (colonic inertia)
Pelvic floor dysfunction

**Look for
concomitant
use of
constipating
drugs,
especially in
older patients**

ple, may vary from several movements a day to several a week. Yet many people believe that "normal" means at least one bowel movement daily and that anything less means constipation. In addition, many people have misconceptions about the appearance and consistency of stools, which may prompt concern and complaints to their physician.

Constipation means different things to different patients: stools too infrequent, stools too hard, stools too difficult to pass, straining, the feeling of incomplete evacuation after a bowel movement, abdominal discomfort.

Defining constipation either as a decrease in the frequency of bowel movements to fewer than three per week, or as subjective symptoms of defecatory dysfunction (eg, painful defecation, incomplete defecation, excessive straining) can facilitate the identification of the underlying cause.⁵

Asking the right questions

A detailed history is the most important part of the diagnostic evaluation. Asking the right questions helps to identify the extent and the cause of the constipation:

- Is the constipation a recent or a chronic problem?
- What is the main complaint: reduced stool frequency, hard stools, excessive straining?
- How many bowel movements per week does the patient have?

Most patients who complain of constipation have no identifiable underlying cause. Nevertheless, the initial history should strive to exclude a wide variety of potential causes, as listed in TABLE 1. These include central and peripheral neurologic diseases, endocrine and metabolic conditions, and colonic obstruction. Many of these causes are easily reversible.

Ask what medications the patient is taking. Anticholinergics, narcotics, and antidepressants are among those that can lead to constipation, particularly in the elderly.

In adults, rectal prolapse, an obstructive cause of constipation, is far more common in women than in men, especially in elderly women. Also, if a patient reports the need to apply pressure on the perineum or on the posterior wall of the vagina for evacuation, the physician should suspect a rectocele.

Laboratory tests

To help identify underlying problems, perform the following laboratory tests routinely in patients who complain of constipation.

Thyroid function. Hypothyroid patients often complain of constipation.

Serum calcium levels. Hypercalcemia due to neoplasms, hyperparathyroidism, and megadose vitamins can cause constipation.

Fecal occult blood testing helps exclude colon cancer, which can cause constipation.

Examination of the anus and rectum

Physical examination may reveal anal fissures or hemorrhoids in patients who complain of painful defecation. Inspection of the anus during attempted defecation can detect prolapse of the rectal mucosa.



Digital rectal examination assesses the presence of fissures, fistulas, and hemorrhoids, as well as anal sphincter tone. The formation of a rectocele can be noted during attempted defecation, while contraction of the anal sphincter suggests pelvic floor dysfunction.

Digital rectal examination also reveals fecal impaction, presenting as a hard to rubbery mass in the rectum. It is especially important to rule out fecal impaction in institutionalized patients, as fecal impaction may present paradoxically as fecal incontinence. In these patients, constipation often goes unsuspected and can be aggravated by treatment with constipating agents.

Anoscopy will identify anal fissures, fistulas, and hemorrhoids in patients complaining of painful defecation.

Evaluation of the colon in patients with recent constipation depends on the presentation. If rectal bleeding or iron deficiency anemia is present, colonoscopy is preferable. Otherwise, barium enema radiography is less costly and is helpful in establishing the presence of megarectum or megacolon.

■ CONSTIPATION OF UNKNOWN CAUSE

In most patients, however, no specific underlying condition can be identified. This is generally the case in middle-aged and elderly women.

Patients in whom no cause for constipation can be identified include those with slow colonic transit and those with pelvic floor dysfunction (rectopubalis dyssynergia, obstructed defecation, pelvic floor dyssynergia). Pelvic floor dysfunction results from a lack of relaxation or paradoxical contraction of the puborectalis muscle and the anal sphincter in response to straining. Clues to the presence of this condition are complaints of excessive straining in spite of the frequent urge to defecate. These patients should be treated empirically, and those that respond poorly to empirical treatment should be referred.

■ STEPWISE APPROACH TO TREATMENT

The great majority of patients with constipation can be treated empirically, regardless of whether an underlying cause is identified. A

TABLE 2

Empirical treatment of constipation: A stepwise approach

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|---------------|---|
| Step 1 | Nonstrenuous exercise
Adequate hydration
Dedicated time for bowel movements
Adequate dietary fiber intake |
| Step 2 | Processed or synthetic fiber (polycarbophil, psyllium, methylcellulose)
Stool softeners with docusate sodium for patients with hard stools |
| Step 3 | Osmotic laxatives (magnesium citrate, magnesium hydroxide, sodium phosphates, lactulose); but avoid in patients with renal insufficiency or on sodium-restricted diet |
| Step 4 | Stimulant laxatives, to promote colonic secretion and motility |

stepwise approach is recommended, as illustrated in TABLE 2.

General measures can be applied at first. These consist of nonstrenuous exercise (eg, walking a few miles a day), adequate hydration (six to eight glasses of water per day), and 15 to 20 minutes of regular dedicated time for bowel movements, preferably in the morning after breakfast, to take advantage of increased colonic motility following food ingestion. An adequate amount of dietary fiber—ie, 20 to 35 g—should be consumed daily. Fiber can be obtained from such sources as whole wheat bread, bran cereal, fruits, and vegetables.

Processed or synthetic fiber (polycarbophil, psyllium, methylcellulose) can be given if patients fail to take in enough fiber from dietary sources. These are available in many preparations. Stool softeners containing docusate can be given to patients with hard stools.

Osmotic laxatives can be added next. This group contains mostly various magnesium salts (magnesium citrate, magnesium hydroxide) or nonabsorbable sugars such as lactulose or sorbitol. They have a good safety profile but should not be used in patients with renal insufficiency, because of the risk of magnesium overload, or in patients on a sodium-restricted diet. The chronic use of mineral oil can result in malabsorption of fat-soluble vit-

Try exercise, dietary fiber, and dedicating time for bowel movements

amins and should be altogether avoided in patients at risk for aspiration, for fear of lipid pneumonia. Cisapride, a prokinetic agent, has shown some promise in recent studies. Water enemas or those containing saline laxatives are less easy to use. Soapsuds enemas can cause colitis⁶ and should be avoided.

Stimulant laxatives should be reserved for last. They stimulate colonic secretion and motility. Most are diphenylmethane derivatives (bisacodyl or phenolphthalein compounds) or anthraquinone derivatives (such as senna). Compounds containing phenolphthalein have been recently withdrawn following warnings of possible carcinogenic effects.

■ REFERRAL FOR ADDITIONAL TESTING

A small minority of patients will not be relieved with the empiric treatments outlined above. These patients should be referred to a specialist or a tertiary center for manometric and radiologic tests to determine colonic transit and anorectal function. What information can be gained from these tests and how that information guides treatment are discussed below.

Testing colonic transit

Colonic transit is usually measured by counting a fixed number of ingested radiopaque markers over several days. Two variations of this test are commonly used. In one, the patient ingests 20 markers and then undergoes abdominal flat-plate radiography 6 days later, which should show 20% or fewer of the markers in the colon.⁷

In the other method, markers are ingested on 3 consecutive days and radiographs are obtained on days 4 and 7.⁸ This allows both total and segmental colonic transit time to be quantified. For adults, the upper limit of normal for total colonic transit is approximately 70 hours. Colonic transit is correlated with bowel movements recorded by the patient.

Both tests require a high-fiber diet and the avoidance of laxatives. The test is ordered for patients whose chief complaint is infrequent defecation. Documentation of prolonged colonic transit is mandatory prior to contemplating colectomy, which is the ultimate treatment for severe constipation. Also, patients

who complain of infrequent defecation yet have normal colonic transit are more likely to have psychological disturbances, as compared with those with slow transit.⁹

Anorectal manometry

Anorectal manometry combined with electromyography of the perianal surface provides pressure profiles of the anal sphincter. Under normal conditions, the intra-abdominal pressure increases and the anal sphincter relaxes, with no electromyographic change.

However, in patients with obstructed defecation, electromyographic activity and increased anal pressure are observed during attempted defecation. This pattern of increased activity may be seen in the laboratory but may be absent in ambulatory studies,¹⁰ or may be present in asymptomatic subjects.¹¹

Anorectal manometry also determines the presence of the recto-anal inhibitory reflex (ie, anal sphincter relaxation in response to rectal distension). Absence of this reflex raises suspicion of Hirschsprung disease (congenital megacolon), which is usually diagnosed in infancy but can be observed in older patients.¹² Patients with megarectum require large volumes to distend the rectum before the reflex can be elicited.

Balloon expulsion

This is a simple test in which the patient attempts to expel air-filled or water-filled balloons of specific volumes, while lying on the left side or sitting on a commode. The inability to expel a balloon can be seen in association with pelvic floor dysfunction or anatomical abnormalities such as a large rectocele or rectal intussusception or prolapse.^{13,14}

Defecography

Defecography involves the instillation of artificial stool (eg, barium thickened to approximate the consistency of stool) into the rectum,¹⁵ then recording fluoroscopic images on videotape during defecation. This is particularly helpful in documenting a rectocele or rectal intussusception or prolapse. The test is used particularly in female patients who require vaginal digital pressure for evacuation or who are unable to expel rectal balloons. However, rectocele is common in asymptomatic

Osmotic laxatives are generally safe, but avoid in patients with renal insufficiency or on a low-salt diet

matic subjects, and rectocele does not necessarily cause constipation, particularly when it is less than 2 cm in size.^{16,17}

Changes in the anorectal angle from resting to squeezing and straining, as well as rectal emptying, may reflect obstructed defecation. However, the findings may not be specific and are seen in asymptomatic subjects.^{18, 19} Also, normal variation in the anorectal angle and its measurements limit the usefulness of defecographic testing for documenting pelvic floor dysfunction.^{16,17,20}

■ TREATMENTS FOR PATIENTS WITH SEVERE CONSTIPATION

Few patients with constipation have anatomical defects such as rectocele or prolapse, conditions treated surgically in adults. Most often, after the above tests, patients are categorized as having slow-transit constipation, pelvic floor dysfunction with or without slow-transit constipation, or functional constipation and irritable bowel syndrome.

Slow-transit constipation

The typical patient with slow-transit constipation has no urge for a bowel movement for more than 3 days, followed by bloating, discomfort, and difficult defecation of hard stools. Approximately 30% of patients with such symptoms prove to have normal colonic transit and have evidence of psychosocial disturbances (eg, anxiety, depression, obsessive-compulsive disorder) on tests such as the Minnesota Multiphasic Personality Inventory (MMPI).²¹ It is important to review the types of laxatives taken and how they are used. Not infrequently, patients avoid the use of laxatives for a week or more for fear of being habituated.

Treatment. Patients should be instructed on the use of proper amounts of laxatives and when to take them. It is not necessary to have a bowel movement every day, and an adequate amount of laxative taken every 2 to 3 days may be sufficient for most patients.

Misoprostol (prostaglandin E-1 analog) can be helpful in some patients,²² but should be used with care in females of childbearing potential, because it can cause abortion.

The decisive treatment for severe consti-

pation is removal of the colon. The most common approach is subtotal colectomy and ileorectal anastomosis. While less radical techniques have been used (ileosigmoid anastomosis, colorectal anastomosis, left-sided colectomy), the more extensive resection provides the best overall results.²³ A notable exception is segmental resection of the sigmoid colon in cases of megasigmoid²⁴ or sigmoidoceles.²⁵

With careful selection of patients, success rates of 50% to 100% can be achieved.^{26–30} The main complication is small bowel obstruction, which can occur in about 10% of patients. Diarrhea and fecal incontinence after the operation tend to improve with time.

The most appropriate candidates for surgery are those with chronic disabling symptoms related to constipation refractory to medical therapy, who have documented slow colonic transit in the absence of dysmotility involving other segments of the gut and, in particular, intestinal pseudo-obstruction. While patients with slow-transit constipation have a very good outcome after colectomy, improvement is limited in those with evidence of proximal gut dysmotility.³¹ Thus, evaluation of gastric motility or small-bowel motility are advised as part of the preoperative evaluation, particularly if symptoms suggest upper gut dysmotility (early satiety, nausea, vomiting, abdominal distension).

Patients with slow-transit constipation who also have pelvic floor dysfunction should undergo biofeedback training prior to surgery. However, the presence of pelvic floor dysfunction may not preclude good results after the operation.^{27,32}

Finally, the psychological profile of the patient has an important bearing on the success of surgery. Constipated patients with anxiety or depression may fair poorly after surgery.³³

Pelvic floor dysfunction

The typical patient with pelvic floor dysfunction is a woman who reports unsuccessful attempts at defecation in spite of a normal urge. Each of the physiological tests described above can suggest the presence of the disorder, but no single test is diagnostic. Consequently, in making the diagnosis, the physician considers the history and supports it with a few tests such as balloon expulsion and electromyogra-

For pelvic floor dysfunction the treatment of choice is retraining with biofeedback



phy. Negative results exclude pelvic floor dysfunction, whereas a positive test points to an abnormality and is supplemented by a defecogram to exclude anatomical abnormalities as described above.

Treatment. In the past, attempts were made to diminish the contractile capacity of the sphincter, either surgically by dividing the puborectalis at different anatomical locations,^{34,35} or by myectomy,³⁶ or medically with botulinum A toxin.³⁷ These interventions produce only partial success and result in some incontinence and have generally been abandoned.

The current treatment of choice is retraining with biofeedback. With the use of manometric probes, electromyography, or both, patients are taught to improve anorectal function by watching their electromyographic or pressure profiles on a monitor. Patients may require a few sessions, each lasting 30 to 60 minutes. Short-term improvement following biofeedback is observed in approximately two thirds of patients,³⁸ but data from long-term follow-up is scant. Biofeedback is safe and painless, but it is time-consuming and requires dedicated and experienced personnel.

REFERENCES

1. Sonnenberg A, Koch TR. Epidemiology of constipation in the United States. *Dis Colon Rectum* 1989; 32:1-8.
2. Sandler RS, Jordon MC, Skelton BJ. Demographic and dietary determinants of constipation in the U.S. population. *Am J Publ Health* 1990; 80(2):185-189.
3. Thompson WG, Creed F, Drossman DA, Heaton KW, Mazzacca G. Functional bowel disease and functional abdominal pain. *Gastroenterology International* 1992; 5:75-91.
4. Drossman DA, Li Z, Andruzzi E, et al. US householder survey of functional gastrointestinal disorders. Prevalence, sociodemography, and health impact. *Dig Dis Sci* 1993;38:1569-1580.
5. Falk GW. Constipation. In: Achkar E, Farmer RG, Fleshler B, editors. *Clinical Gastroenterology*. Philadelphia: Lea and Febiger, 1992; 70-81.
6. Orchard JL, Lawson R. Severe colitis induced by soap enemas. *South Med J* 1986; 79:1459-1460.
7. Hinton JM, Lennard-Jones JE, Young AC. A new method for studying gut transit times using radioopaque markers. *Gut* 1969; 10:842-847.
8. Metcalf AM, Phillips SF, Zinsmeister AR, et al. Simplified assessment of segmental colonic transit. *Gastroenterology* 1987; 92:40-47.
9. Caruana BJ, Hinds JP, Freimanis M, et al. Psychological and physiological characteristics of patients with severe idiopathic constipation. *Gastroenterology* 1989; 97:932-937.
10. Duthie GS, Bartolo DCC. Anismus: the cause of constipation? Results of investigation and treatment. *World J Surg* 1992; 16:831-835.
11. Voderholzer WA, Neuhaus DA, Klausner AG, Tzavella K, Muller-Lissner SA, Schindbeck NE. Paradoxical sphincter contraction is rarely indicative of anismus. *Gut* 1997; 41:258-262.
12. Anuras S, Hade JE, Soffer EE, et al. Natural history of adult Hirschsprung's disease. *J Clin Gastroenterol* 1984; 6:205-210.
13. Barnes PRH, Lennard-Jones JE. Balloon expulsion from the rectum in constipation of different types. *Gut* 1985; 26:1049-1052.
14. Fleshman JW, Dreznik Z, Cohen E, Fry RD, Kodner IJ. Balloon expulsion test facilitates diagnosis of pelvic floor outlet obstruction due to non-relaxing puborectalis muscle. *Dis Colon Rectum* 1992; 35:1019-1025.
15. Finlay IG, Bartolo DCC, Bartram CI, et al. Proctography (symposium). *Int J Colorect Dis* 1988; 3:67-69.
16. Bartram CI, Turnbull GK, Lennard-Jones JE. Evacuation proctography: An investigation of rectal expulsion in 20 subjects without defecatory disturbance. *Gastrointest Radiol* 1988; 13:72-80.
17. Shorvon PJ, McHugh F, Diamant NE, et al. Defecography in normal volunteers: Results and implications. *Gut* 1989; 30:1737-1749.
18. Jones PN, Lubowski, DZ, Swash M., Henry MM. Is paradoxical contraction of the puborectalis muscles of functional importance? *Dis Colon Rectum* 1987; 30:667-670.
19. Miller R, Duthie GS, Bartolo DCC, et al. Anismus in patients with normal and slow transit constipation. *Br J Surg* 1991; 78:690-692.
20. Wald A, Jafri R, Rehder J, Holeva K. Scintigraphic studies of rectal emptying in patients with constipation and defecatory difficulty. *Dig Dis Sci* 1993; 38:353-358.
21. Wald A, Burgio K, Holeva K, Locher J. Psychological evaluation of patients with severe idiopathic constipation: which instrument to use. *Am J Gastroenterol* 1992; 87:977-980.
22. Soffer EE, Launspach J, Metcalf A. The effects of misoprostol on patients with severe chronic constipation. *Dig Dis Sci* 1994; 39:929-933.
23. Pfeifer J, Agachan F, Wexner S. Surgery for constipation: a review. *Dis Colon Rectum* 1996; 39:444-460.
24. Belliveau P, Goldberg SM, Rothenberger DA, Nivatvongs S. Idiopathic acquired megacolon: the value of subtotal colectomy. *Dis Colon Rectum* 1982; 25:118-121.
25. Jorge J, Yang Y, Wexner S. Incidence and clinical significance of sigmoidoceles as determined by a new classification system. *Dis Colon Rectum* 1994; 37:1112-1117.
26. Leon S, Krishnamurthy S, Shuffler M. Subtotal colectomy for severe idiopathic constipation. *Dig Dis Sci* 1987; 32:1249-1254.
27. Kamm M, Hawley P, Lennard-Jones J. Outcome of colectomy for severe idiopathic constipation. *Gut* 1998; 29:969-973.
28. Beck D, Fazio V, Jagelman D, Lavery IC. Surgical management of colonic inertia. *South Med J* 1989; 82:305-309.
29. Yoshioka K, Keighley M. Clinical results of colectomy for severe constipation. *Br J Surg* 1989; 76:600-604.
30. Piccirillo M, Reissman P, Carnavos R, Wexner S. Colectomy as treatment for constipation in selected patients. *Br J Surg* 1995; 82:898-901.
31. Redmond J, Smith G, Barofsky I, Ratych R, Goldsborough D, Schuster M. Physiological tests to predict long-term outcome of total abdominal colectomy for intractable constipation. *Am J Gastroenterol* 1995; 90:748-753.
32. Pemberton J, Rath D, Ilstrup D. Evaluation and surgical treatment of severe chronic constipation. *Ann Surg* 1991; 214:403-413.
33. Fisher S, Breckan K, Andrews H, Keighley M. Psychiatric screening for patients with fecal incontinence on chronic constipation referred for surgical treatment. *Br J Surg* 1998; 76:352-355.
34. Barnes PR, Hawley PR, Preston DM, Lennard-Jones JE. Experience of posterior division of the puborectalis muscle in the management of chronic constipation. *Br J Surg* 1985; 72:475-477.
35. Kamm MA, Hawley PR, Lennard-Jones JE. Lateral division of the puborectalis muscle in the management of severe constipation. *Br J Surg* 1988; 75:661-663.
36. Yoshioka K, Keighley MR. Anorectal myectomy for outlet obstruction. *Br J Surg* 1987; 74:373-376.
37. Hallan RI, Williams NS, Melling J, et al. Treatment of anismus in intractable constipation with botulinum A toxin. *Lancet*. 1988; 2:714-717.
38. Enck P. Biofeedback training in disordered defecation. *Dig Dis Sci* 1993; 38:1953-1960.

ADDRESS: Edy E. Soffer MD, Department of Gastroenterology-Hepatology, S40, The Cleveland Clinic Foundation, 9500 Euclid Avenue, Cleveland, OH 44195.