REVIEW

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Fecal incontinence in elderly patients: Common, treatable, yet often undiagnosed

ABSTRACT

It is important for primary care physicians to take fecal incontinence seriously and not dismiss it as a normal part of aging. Elderly patients may be reluctant to admit fecal incontinence, so clinicians need to ask about it. Two of the most common causes are fecal impaction (especially in nursing home patients) and rectosphincter dysfunction in people with diabetes.

KEY POINTS

After diarrhea is ruled out or treated, the three main causes of fecal incontinence are impaction (the most common), rectosphincter dysfunction, and reservoir incontinence.

A key question is whether the incontinence is passive or associated with urge: incontinence due to impaction or rectosphincter dysfunction is passive, whereas reservoir incontinence is associated with urge.

A negative digital rectal examination does not rule out proximal impaction; abdominal plain films may be needed.

Impaction is treated with a three-step program: disimpaction (manual or with enemas), oral polyethylene glycol solutions, and maintenance therapies to reduce the risk of recurrence.

Diabetic neuropathy is a major cause of rectosphincter dysfunction. Anorectal manometry aids in the diagnosis. Biofeedback is the first-line treatment for those with rectal sensation.

FECAL INCONTINENCE often goes undiagnosed and untreated in elderly patients because the social stigma attached to the disorder makes many patients reluctant to admit the problem. In addition, physicians tend not to ask about it, perhaps because of similar embarrassment or because they do not see it as "important."

But geriatric fecal incontinence *is* important, for several reasons.

- It is common. Large population surveys reveal a prevalence of 3% to 7% among people age 65 and over.[1,2] In elderly patients in nursing homes, the prevalence is as high as 50%.[3,4]
- It has a significant financial impact on patients, families, and the health care system. This goes beyond the expense of adult diapers: incontinence is one of the most common causes of institutionalization of the elderly, a costly burden on patients and families.
- It has a devastating social impact on the elderly patient, ranging from mild embarrassment and nuisance to significant alteration in lifestyle and social isolation.
- It contributes to many common psychological problems in the elderly, including depression and resulting cognitive impairment.
- It may even be associated with death, as shown in a prospective study of community-residing elderly patients with varying degrees of fecal incontinence.[5]
- It often can be treated effectively. Fecal impaction in nursing home patients and rectosphincter dysfunction due to muscle laxity or diabetic neuropathy are the two prime causes of fecal incontinence in the elderly, and effec-

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Anorectal anatomy and physiology

The rectum, the most distal part of the colon, functions as a reservoir for stool. It expands to receive a threshold amount, beyond which there is normally an urge to defecate.

The anus is a 3-cm to 4-cm muscular canal, closed as an anterior-posterior slit because of spongy soft tissue and tonic contraction of the sphincter.

The internal anal sphincter is an involuntary smooth muscle surrounding the anal canal, while **the external anal sphincter** is a striated muscle under voluntary control of the pudendal nerve.

The muscles of the pelvic floor contribute to the external anal sphincter tone and function as a sling supporting the anorectal angle, an additional factor in maintaining continence of feces and gas.

HOW DEFECATION WORKS

Continence and ordered defecation depend on the coordinated sensory and motor innervation of the structures mentioned above.

When a threshold volume in the rectum is reached, stretch receptors are activated in the myenteric plexus in the walls of the rectum and along the pelvic floor, leading to a sensation of urge. Autonomic nerves from the sacral plexus further innervate the rectum. There are two reflex mechanisms important for continence:

The rectal-anal inhibitory reflex. A threshold distension of the rectum inhibits the tone of the internal anal sphincter, allowing the contents of the rectum to transiently pass into the anus. The anus is densely innervated with somatic sensory fibers capable of discerning the rectal contents (anal sampling). Continued rectal distension leads to habituation and return to normal internal sphincter tone until the next incremental distension.

The rectal-pudendal reflex. Rectal distension also leads to reflexive somatic motor contraction of the external sphincter, allowing for maintenance of continence.

Motor activity within the rectum is also important for anorectal function. At the appropriate time, orderly peristalsis with reflexive relaxation of the internal sphincter and voluntary relaxation of the external sphincter allows for defecation. Disturbances of these normal physiologic mechanisms commonly result in fecal incontinence in older people.

tive treatments exist for both conditions.

This article provides a case-based discussion of the diagnosis and treatment of the most common causes of fecal incontinence in elderly people, and offers a practical diagnostic and treatment algorithm.

DETERMINING THE CAUSE OF FECAL INCONTINENCE

Fecal incontinence is defined as continuous or recurrent uncontrolled passage of fecal material for at least 1 month in a mature person.[6] Both acute and recurrent fecal incontinence occur commonly in elderly patients with comorbid conditions.

The history and physical examination should aim at identifying potential causes. Detailed reviews of the causes of fecal incontinence in the general population are available elsewhere.[7,8]

Factors that contribute to the development of fecal incontinence in the elderly include:

- Disorders of muscle integrity or innervation
- A decrease in rectal sensation or compliance
- Declining mental function
- Loss of physical mobility.

Dementia (eg, due to Alzheimer disease, Parkinson disease, or multiple infarcts) is a major factor in the development of incontinence in elderly patients. Many demented patients cannot sense rectal distension, or they ignore the urge to stool and therefore become impacted, with subsequent intermittent leakage.

First, does the patient have diarrhea?

Diarrhea is a common and preventable exacerbating factor in geriatric fecal incontinence,

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as a high volume of watery stool can lead to leakage even if the rectosphincteric mechanism is intact.[9] Questioning about diarrhea is warranted, as is testing to determine its cause.

Treating the diarrhea can often resolve or improve fecal incontinence. In chronic diarrhea, opiate derivatives can improve symptoms. Limited data show loperamide to be superior to other opiates in preventing episodes of fecal incontinence.[10] However, combinations of opiate and anticholinergic drugs (eg, the combination of diphenoxylate and atropine, sold as Diphenatol, Lomocol, Lomotil, and Lonox) are not recommended for elderly patients, as such preparations may predispose elderly patients to significant side effects—particularly mental status changes and urinary retention. Furthermore, use of antidiarrheal medications can lead to constipation, subsequent fecal impaction, and possible worsening of fecal incontinence. Periodic enemas may help prevent this complication.

Is the incontinence passive or related to urgency?

Further questioning about the nature of incontinence (passive vs urgency) helps further delineate various causes.

Passive incontinence usually indicates a defect in sphincter muscle integrity, loss of sphincter innervation, or decreased rectal sensation. Common causes of passive incontinence include spinal cord trauma, central nervous system diseases, peripheral and autonomic neuropathies, rectal prolapse, and obstetric trauma.

Although obstetric trauma is most common in younger women, it is also an important factor in geriatric patients, as previous obstetric injury may contribute to many cases of "idiopathic" fecal incontinence in elderly women. A careful obstetric history should be taken from all elderly women with incontinence, including the number of vaginal deliveries, use of obstetric forceps, and the delivery of high-birth-weight infants.

Passive incontinence may also suggest "overflow," caused by fecal impaction or rectal neoplasms. The new onset of rectosphincter dysfunction and passive incontinence, or the combination of urinary and fecal incontinence, suggests spinal cord compression. If this is a consideration, urgent spinal imaging and neurosurgical consultation are vital.

Urgency to stool followed by incontinence of small amounts of feces usually suggests a problem with the rectal reservoir. Colitis, whether due to ischemia, inflammation, or radiation, can decrease rectal compliance and lead to urge incontinence.

The rest of our discussion is a case-based review of several predominant causes of fecal incontinence in the elderly.

CASE 1: 'ALL BOUND UP'

An 80-year-old woman who lives in a nursing home is seen for a regular checkup. She is mildly demented and is bed-bound due to severe rheumatoid arthritis. She complains of incontinence of small amounts of liquid brown stool several times a day. Her medical history includes hypertension treated with a calcium channel blocker. She has vague abdominal discomfort and chronic constipation, for which she takes stimulant laxatives.

Her abdomen is soft, nontender, and doughy with normal bowel sounds. Her rectum has normal tone, and no stool is palpable in the rectal vault. A radiograph of the abdomen reveals dense stool throughout the proximal and descending colon, however. The diagnosis of fecal impaction is made and treatment is begun.

IMPACTION IS COMMON IN NURSING HOME PATIENTS

Fecal impaction is the most common cause of fecal incontinence in nursing homes

Fecal impaction, defined as functional blockage of the colon and rectum by hard, dry stool, is the most common cause of fecal incontinence in elderly nursing home patients. One study of geriatric patients admitted to an acute care hospital in England showed a 42% prevalence of fecal impaction.[11]

A number of common conditions predispose the elderly to fecal impaction (TABLE 1). Notable is polypharmacy with constipating drugs, and chronic use of laxatives, as in our patient, can worsen constipation. A common scenario is impaction developing in an elderly postoperative patient receiving narcotic analgesics. Reduced fluid intake is another common contributing factor and can be due to

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TABLE 1

Fecal incontinence due to impaction

History
- Risk factors
  - Atonic colon, chronic laxative abuse, constipating medications (eg, calcium channel blockers, narcotics, iron), dehydration, delirium, dementia, depression, immobility, malnutrition, obstruction (mechanical), sedentary lifestyle, weakness (general or focal)
- Passive, intermittent soiling
- Small, liquid stools
- Preceding constipation
- Other symptoms
  - Abdominal distention or bloating, abdominal pain, anorexia, diarrhea, nausea and vomiting, perforation or peritonitis, rectal discomfort, urinary frequency, weight loss

Physical examination
- Abdominal distension or bloating
- Hardened stool in the rectum (NB: rectal examination does not rule out proximal impaction)

Further diagnostic workup
- Abdominal plain radiography, if rectal examination is negative

Treatment
- Step 1: Disimpaction, either manually with anesthetic lubricant or with enemas
- Step 2: Polyethylene glycol solutions
- Step 3: Maintenance therapy with fiber supplementation, stool softeners, increased mobility, avoidance of constipating medications, weekly enemas or laxatives as needed (enemas preferable, as they are more predictable)

Diagnose fecal impaction with rectal exam plus abdominal x-ray

impaired thirst perception, avoidance of fluids (in patients with urinary incontinence), or limited access to liquids because of immobility.

Fecal impaction is often thought to cause "overflow" incontinence, but the actual process is more complex. Patients with fecal impaction and incontinence have a normal threshold for activation of the anorectal inhibitory reflex, allowing frequent transient relaxation of the internal anal sphincter, but a higher threshold for sensing rectal distension and urgency.[11] This leads to the common clinical presentation of passive, intermittent soiling as patients fail to voluntarily contract the external sphincter in response to rectal distension.

Fecal impaction can also result in diarrhea past the impacted stool, exacerbating incontinence.

Other common signs and symptoms of impaction are listed in TABLE 1. Occasionally, impaction can progress to severe colonic distension, perforation, and peritonitis requiring surgical intervention.

Diagnosis of fecal impaction

Fecal impaction is diagnosed by rectal examination in combination with abdominal radiography. Fecal impaction usually but not always involves the rectum, so a negative rectal examination does not rule out fecal impaction. One study found only a slight correlation between palpable stool in the rectal vault and high fecal loads as detected on radiography.[12]

Approach to treating fecal impaction

Treatment of fecal impaction (TABLE 1) improves fecal incontinence in institutionalized or immobile geriatric patients, reducing the number of episodes of fecal soiling and decreasing the workload on caregivers.[13]

Step 1. Disimpaction can be done manually with anesthetic lubricant or by mineral oil enemas. Mineral oil enemas should be given for 2 to 3 days for maximal effect.

Step 2. Oral polyethylene glycol solutions (eg, GoLYTELY, others) are safe and proven to prevent reaccumulation of feces in the colon.[14,15] However, they should not be

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given if there is evidence of colonic dilatation or obstruction. Smaller volumes (1 to 2 L) can be used than for bowel preparation. Solutions containing magnesium, phosphate, or citrate should be avoided, especially in patients with hypertension, congestive heart failure, or chronic renal failure, because absorption of these electrolytes is increased in fecal impaction.

Step 3. Maintenance therapy should focus on risk reduction: ie, using fiber supplements and stool softeners as appropriate, increasing mobility, and avoiding constipating drugs. Fiber supplements and bulking agents should never be given to patients with *acute* fecal impaction, however. Enemas or laxatives can be given weekly as needed; enemas are generally preferable to stimulant laxatives because they have a predictable and timely response.

Dietary changes are still controversial. We do not have enough data to know which to recommend: a low-residue diet to decrease colonic filling or a high-fiber diet to improve constipation and irregularity. However, dietary changes are probably not as important as frequent colonic cleansing in preventing impaction.

CASE 2: NOT SO ANAL-RETENTIVE

A 70-year-old man presents to his physician complaining of intermittent passive fecal soiling, along with early satiety, weight loss, frequent watery diarrhea, and mild nausea. He has a history of poorly controlled diabetes mellitus.

On examination, his abdomen is slightly distended, a succussion splash is audible, and his rectal tone is decreased (basal and squeeze). He is referred to a gastroenterologist and undergoes anal manometry, which shows decreased rectal sensation, diminished internal sphincter pressures, and delayed voluntary contraction of the external sphincter in response to rectal distension.

RECTOSPHINCTERIC DYSFUNCTION: COMMON IN DIABETES

Leakage of stool can result from dysfunction of either the internal or external anal sphincter. Both the mean squeeze pressure (reflective of external sphincter function) and the resting anal pressure (mostly reflecting internal sphincter function) decrease with age.[16] Women are more likely than men to have a decline in mean squeeze pressure, reflecting sphincter dysfunction.[17]

Causes of external sphincter dysfunction

Muscle fatigue contributes to external sphincter dysfunction. A short fatigue-rate index, ie, the calculated time necessary for the external sphincter to become completely fatigued, correlates with incontinence.[18] This may represent a change in the proportion of type 1 to type 2 muscle fibers within the external sphincter, leading to an impaired ability to sustain contraction.

Loss of control of the external sphincter results in the inability to voluntarily prevent passage of stool during periods of normal internal sphincter relaxation. Elderly patients demonstrate changes in sphincter function, including increased perineal descent during defecation, increased pudendal nerve latency, and age-related atrophy, accounting for demonstrated laxity and weakness in the external sphincter.[19] If such changes are severe enough to overwhelm other continence mechanisms, leakage can occur.

External sphincter dysfunction is thought to result from pudendal nerve damage and distal denervation of the external sphincter and the muscles of the pelvic floor.[20,21] Proposed mechanisms of injury to the pudendal nerve include chronic straining on defecation and occult injury from childbirth.[22] Polyneuropathies, including those associated with diabetes, vitamin B_{12} deficiency, multiple myeloma, and hypothyroidism, can also result in pudendal nerve dysfunction and impaired sphincter contraction, leading to fecal incontinence.

Diet is probably not as important as colonic cleansing in preventing impaction

Diabetes and internal sphincter dysfunction

Diabetes, which is common in the elderly, results in a myriad of abnormalities of gastrointestinal function, including fecal incontinence.

One way diabetes causes fecal incontinence is by decreasing rectal sensation, leading to inappropriate internal sphincter relaxation. Incontinent diabetic patients have

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TABLE 2

Fecal incontinence due to rectosphincter dysfunction

History
- Passive soiling
- Female sex
- Diabetes mellitus
- Symptoms of neuropathy
- Symptoms of cord compression

Physical examination
- Loss of rectal basal or squeeze tone
- Neurologic evidence of central nervous system lesion or compression

Further diagnostic workup
- Anorectal manometry
- Anal endosonography
- Referral to a colorectal surgeon

Treatment
- Biofeedback
- Habit training
- Behavioral therapy
- Bulk-forming agents
- Surgery, if due to trauma or an occult defect, or if no response to other treatments

higher rectal sensory thresholds than continent patients, meaning that a higher volume of rectal contents is required to create a sense of urgency.[23] Threshold rectal volumes for relaxation of the internal sphincter (rectal-anal inhibitory reflex), however, do not differ.

In addition, patients with diabetes and incontinence have a longer delay to voluntary contraction of the external sphincter (recto-pudendal reflex) with a given rectal distension. This physiologic impairment results in intermittent passive leakage of stool.

Diabetes with autonomic enteropathy often leads to diarrhea, which can exacerbate incontinence, as well.

Assessing sphincter function

Diagnosis of problems of sensory and sphincter function of the anus and rectum is aided by the rectal examination and anorectal manometry (TABLE 2).

Rectal examination includes inspection of undergarments for fecal staining and visual inspection of the anus to exclude common conditions that cause "pseudo-incontinence," ie, leakage from perianal fissures, fistulas, or abscesses, which can mimic anal incontinence. A gaping anus implies severe sphincteric dysfunction. Asking the patient to bear down enables the diagnosis of rectal prolapse, a cause of incontinence particularly amenable to surgical correction.

The digital rectal examination helps rule out rectal masses and assesses both resting anal pressure and squeeze pressure. The puborectalis muscle is assessed by palpating the posterior anal canal and asking the patient to bear down. An intact puborectalis muscle displaces the examining finger anteriorly.

The "anal wink" reflex is a test of both perineal sensation and pudendal motor function. This test is performed by gently stroking the perianal skin bilaterally. If the anocutaneous reflex is intact, a reflexive constriction of the exernal sphincter is observed.

Anorectal manometry tests rectal sensation and compliance through the use of an intrarectal balloon that measures basal and squeeze pressures within the external anal sphincter and assesses tonic and reflex contraction of the internal sphincter. Manometry is indicated when rectosphincteric dysfunction is suspected, because it often provides a clearer insight into the pathophysiologic process than the history and physical alone, and often leads to a change in clinical management of incontinence.[24,25]

Anal endosonography is frequently used before planned surgical sphincter repair and is more sensitive for detecting occult structural sphincter defects than clinical assessment alone.[26]

Electromyography is useful in ascertaining neuropathy and myopathy of the sphincter apparatus, which could be contributing to rectosphincteric dysfunction.

Pudendal nerve latency studies assess pudendal neuropathy and may predict the outcome of reconstructive surgery.[27]

Treatment of sphincter dysfunction: Try biofeedback first

The first-line treatment for rectosphincter dysfunction is biofeedback. Patients relearn to perceive rectal distention with intrarectal balloons and to adequately contract the external

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sphincter with visual manometry. Newer home devices use electromyography rather than the traditional balloons and are convenient for eligible elderly patients. In diabetic patients, rectal sensory conditioning can be added to increase perception and reaction to decreasing rectal volumes.[28]

Biofeedback has proven efficacy in the general population. Thirteen studies between 1974 and 1990 in the general adult population showed overall success rates ranging from 50% to 92%.[29] Other data have also shown a good long-term outcome for biofeedback.[30] One study suggests a similar benefit in elderly patients, showing an improvement in sphincter contraction in response to rectal distention.[31]

Elderly candidates for biofeedback must meet certain criteria. Biofeedback requires cooperation and motivation, so the patient must be able to comprehend and follow directions. It is usually unsuccessful in demented and cognitively impaired patients. Finally, the patient must have some degree of rectal sensation to learn to perceive and respond to rectal distention.

Alternatives to biofeedback

Alternatives to biofeedback for patients with rectosphincter dysfunction are chosen based on the cause of incontinence.

Habit training can be helpful in patients with dementia. It requires some degree of motivation by caregivers, as it involves taking the patient to the toilet at specific and frequent times through the day, usually after meals to take advantage of the gastrocolic reflex.[32]

Increasing fluid intake, giving bulk-forming agents, and maximizing mobility are other simple measures to decrease the frequency of incontinent episodes in demented patients.

Surgery is considered when medical and biofeedback therapy is unsuccessful, or when the condition is thought to best respond to surgical repair (eg, trauma). Most common is the anterior sphincter repair, involving mobilizing the anterior sphincter and wrapping it to functionally tighten it. This technique is effective in elderly patients with previous sphincter trauma or defects detectable with anal endosonography.[33]

TABLE 3

Fecal reservoir incontinence

History
- Urge incontinence
- Symptoms of colitis
- Recent antibiotic use
- Atrial fibrillation, congestive heart failure or hypertension (suggest ischemic colitis)
- Colectomy
- Inflammatory bowel disease

Physical examination
- Fissures, abscesses, fistulas
- Extraintestinal manifestations of Crohn disease

Further diagnostic workup
- Referral to a gastroenterologist for endoscopy, if diagnosis is still in question
- Fecal cultures, *Clostridium difficile* toxin
- Anal manometry with rectal compliance measurement

Treatment
- Treat underlying disease
  - Metronidazole for *C difficile*
  - Steroids, 5-ASA (mesalamine), immunosuppressives for inflammatory bowel disease
  - Optimization of cardiovascular conditions
- Minimize fecal bulk (avoid fiber)
- Constipating agents such as loperamide or other opiates

If anterior sphincter repair is not feasible or is unsuccessful, alternative surgical therapies exist, although they have not been adequately tested in older patients. The creation of a neosphincter using a transposed gracilis muscle under electrical stimulation has shown a favorable outcome in 75% of treated patients.[34] In another young patient population, implantation of an artificial sphincter has been shown to improve continence and quality of life.[35]

Occasionally, medical and conventional surgical management is either unsuccessful or inappropriate. In such cases, a colostomy may improve the emotional distress of frequent fecal incontinence.

RESERVOIR INCONTINENCE

Reservoir incontinence is a less common cause of fecal incontinence in the elderly.

As mentioned above, colitides common

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in the elderly (ischemic, infectious, ulcerative) can lead to a loss of compliance of the rectal wall, leading to frequency, urgency, and leakage of stool. Furthermore, lack of a rectum, common in many elderly patients who have had colonic resections with end-to-end anastomoses, can lead to frequent urge incontinence of stool.

Diagnosis is usually based on symptoms, lower endoscopy, and direct measurement of rectal compliance (TABLE 3).

Therapy involves treatment of the underlying condition, managing coexisting diarrhea, and decreasing bulk with a low-fiber diet and constipating agents to minimize rectal filling.

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