

## Fecal incontinence

G. Karamanolis, E. Nastos

Fecal incontinence is the recurrent uncontrolled passage of fecal material, of 1 month or greater duration, in an individual with a developmental age of at least 4 years.<sup>1</sup> Patients who have fecal incontinence are also distressed by involuntary passage of flatus. However, involuntary passage of flatus alone should probably not be characterized as fecal incontinence.<sup>2</sup> Although the physical consequences of incontinence are modest, the psychosocial consequences are often overwhelming and include diminished self-esteem, social isolation and anxiety of having unexpected episodes.<sup>2,3</sup>

The prevalence increases steadily with age, from approximately 4% for any incontinence in men and women aged between 40 and 49 years old to 11.6% in patients aged 80 years and older; incontinence is more frequent and severe in older compared to younger patients and also in nursing home residents.<sup>2,4</sup> General risk factors for fecal incontinence are: age older than 65 years, female sex, poor general health and physical limitations.<sup>5</sup>

### ETIOLOGY

Fecal incontinence is generally attributable to a combination of impaired pelvic floor continence mechanisms and disordered bowel habits. Clinically overt anal tears occurred in approximately 3.3% of women after a vaginal delivery.<sup>6</sup> However, endoanal US identified anal sphincter defects in 35% of women after their first vaginal delivery.<sup>7</sup> The precise role of obstetric anal sphincter injury to fecal incontinence is unclear and other factors including aging, menopause and chronic straining are also likely to contribute to it.<sup>2</sup> Surgical procedures that

may predispose to fecal incontinence include hemorrhoidectomy internal sphincterotomy and fistulotomy.<sup>2</sup> Several neurological disorders are associated with incontinence. Anal sphincter weakness, diminished rectoanal sensation and diarrhea in patients who have diabetic neuropathy.<sup>2</sup> Anatomical disturbances of the pelvic floor (fistula, rectal prolapse), inflammatory conditions (inflammatory bowel disease, radiation proctitis) and central nervous system diseases (stroke, brain tumours, spinal cord lesions, multiple sclerosis) are conditions that can cause fecal incontinence. Fifty percent of unselected outpatients with multiple sclerosis had fecal incontinence.<sup>2,8</sup>

### CLINICAL EVALUATION

The clinical evaluation is the cornerstone of arriving at an accurate diagnosis and formulating a logical strategy for diagnostic testing and treatment. Patients who have chronic diarrhea, fecal urgency, constipation, prolapsed hemorrhoids, urinary incontinence and diabetes mellitus must be asked if they have fecal incontinence. Staining, soiling, seepage and leakage are terms used to reflect the nature and severity of incontinence. Soiling indicates more leakage than staining of underwear; seepage refers to leakage of small amounts of stool. Physicians and patients agree that infrequent incontinence of flatus reflects mild while frequent leakage of liquid and stool reflects severe incontinence.<sup>9</sup> However, the type and frequency of episodes of incontinence alone will underestimate the severity of the disorder in a patient who is housebound, having withdrawn from professional and social activities.<sup>2</sup>

The awareness of the desire to defecate before the episode of incontinence is variable and may provide clues to pathophysiology. Patients who have urge incontinence experience the desire to defecate, but cannot reach the toilet on time. Patients who have passive incontinence are not aware of the desire to defecate before the incon-

*Gastroenterology Clinic, Athens Naval and Veterans Hospital*

*Author for correspondence:*

Georgios Karamanolis, 3 Monis Kikkou, 15669 Papagou, Athens, Greece, Tel: +30210-6544196/+306944-520410, Fax: +30210-7242103, e-mail: gkfarsal@hol.gr

tinence episode. Patients who have urge incontinence have reduced squeeze pressures, whereas patients who have passive incontinence have lower resting pressures.<sup>10-11</sup> A complete anorectal examination in the left lateral decubitus has a positive predictive value of 67% and 81%, for identifying low resting and squeeze pressure respectively.<sup>12</sup>

## DIAGNOSTIC TESTING

Endoscopy to identify mucosal pathology is probably necessary for incontinent patients who have diarrhea or constipation. For ambulatory healthy patients, anorectal manometry and endoanal US images are important diagnostic tests to document severity of weakness and identify abnormal sphincter morphology.<sup>2</sup> In one study, maximum squeeze pressure less than 60 mmHg in females had 60% sensitivity and 78% specificity for discriminating between asymptomatic controls and fecal incontinence.<sup>13</sup> Endoanal US identifies sphincter thinning and defects, which are often clinically unrecognized and amenable to surgical repair.<sup>14</sup>

Evacuation proctography may be useful to document clinically suspected but not overt excessive perineal descent or pelvic organ prolapse, particularly before surgery. Pelvic MRI, combines static and dynamic imaging without radiation exposure, is useful for identifying external sphincter atrophy and pelvic organ prolapse, but is relatively expensive and not widely available.<sup>2</sup> MRI performed better than US for the assessment of the external sphincter; external sphincter atrophy is a good prognostic factor for incontinence after repair of external sphincter defects.<sup>15,16</sup> Anal sphincter electromyography (EMG) should be considered for incontinent patients who have underlying disease associated with a neuropathy, clinical suspicion of a proximal neurogenic process or sphincter weakness unexplained by morphology as visualized by US.<sup>2</sup> The advanced tests (pelvic MRI, anal sphincter EMG, assessment of rectal compliance and rectoanal sensation) are available only in specialized centers, where patients with moderate-severe fecal incontinence should be referred for further assessment.

## MANAGEMENT

Management of fecal incontinence must be tailored to clinical manifestations including treatment of underlying diseases. Modifying irregular bowel habits is often the cornerstone to effectively managing incontinence. In patients who have diarrhea, loperamide given at an adequate dose (before meals and social events, up to 16 mg/

day in divided doses) increased fecal consistency, decreased urgency and increased internal sphincter tone.<sup>17</sup> Patients who have constipation, fecal impaction and overflow incontinence may benefit from a regularized evacuation programme, incorporating timed evacuation by digital stimulation, bisacodyl/glycerol suppositories and fibre supplementation.<sup>18</sup>

Biofeedback therapy is based on the principle of operant conditioning. Using a rectal balloon-anal manometry device, patients are taught to contract the external anal sphincter when they perceive balloon distension; perception may be reinforced by visual tracings of balloon volume and anal pressure and the procedure is repeated with progressively smaller volumes. Several uncontrolled studies suggest continence improves in approximately 70% of patients.<sup>2,19</sup> Prerequisites for success include motivation, intact cognition, absence of depression and some rectal sensation. Biofeedback improves rectal sensation, coordinates external sphincter contraction and is likely to increase anal sphincter tone and restore sphincter integrity.<sup>2</sup>

Continence improved in up to 85% of patients with sphincter defects after an anterior sphincteroplasty. For unclear reasons, continence deteriorates through time and only 50% of patients remain continent up to 5 years after the operation.<sup>20</sup>

Sacral nerve stimulation is a device implanted in patients who have urinary incontinence. A multicenter study from USA assessing sacral nerve stimulation for fecal incontinence is in progress. It seems to increase squeeze pressure more than resting pressure and modulate rectal sensation. Sacral stimulation is conducted as a staged procedure; patients whose symptoms respond to temporary stimulation over approximately 2 weeks proceed to permanent subcutaneous implantation of the device. Other surgical therapies such as artificial anal sphincter procedure and dynamic graciloplasty are associated with significant morbidity and should be restricted to carefully selected patients. A colostomy is the last resort for patients with severe incontinence.<sup>2</sup>

## REFERENCES

1. Whitehead WE, Wald A, Norton NJ. Treatment options for fecal incontinence. *Dis Colon Rectum* 2001; 44:131-142.
2. Bharucha AE. Fecal incontinence. *Gastroenterology* 2003; 124:1672-1685.
3. Rockwood TH, Church JM, Fleshman JW. Fecal incontinence quality of life scale: quality of life instrument for patients with fecal incontinence. *Dis Colon Rectum* 2000;

- 43:9-16.
4. Perry S, Shaw C, McGrother C. Prevalence of faecal incontinence in adults aged 40 years or more living in the community. *Gut* 2002; 50:480-484.
  5. Nelson R, Norton N, Cautley E, et al. Community-based prevalence of anal incontinence. *JAMA* 1995; 274:559-561.
  6. Samuelsson E, Ladfors L, Wennerholm UB, et al. Anal sphincter tears: prospective study of obstetric risk factors. *Int J Obstet Gynaecol* 2000; 107:926-931.
  7. Sultan AH, Kamm MA, Hudson CN, et al. Anal-sphincter disruption during vaginal delivery. *N Engl J Med* 1993; 329:1905-1911.
  8. Wiesel PH, Norton C, Glickman S, et al. Pathophysiology and management of bowel dysfunction in multiple sclerosis. *Eur J Gastroenterol Hepatol* 2001; 13:441-448.
  9. Rockwood TH, Church JM, Fleshman JW. Patient and surgeon ranking of the severity of symptoms associated with fecal incontinence: the fecal incontinence severity index. *Dis Colon Rectum* 1999; 42:1525-1532.
  10. Engel AF, Kamm MA, Bartram CI, et al. Relationship of symptoms in fecal incontinence to specific sphincter abnormalities. *Int J Colorectal Dis* 1995; 10:152-155.
  11. Chiarioni G, Scattolini C, Bonfante F, et al. Liquid stool incontinence with severe urgency: anorectal function and effective biofeedback treatment. *Gut* 1993; 34:1576-1580.
  12. Hill J, Corson RJ, Brandon H, et al. History and examination in the assessment of patients with idiopathic fecal incontinence. *Dis Colon Rectum* 1994; 37:473-477.
  13. Felt-Bersma RJ, Klinkenberg-Knol EC, Meuwissen SG. Anorectal function investigations in incontinent and continent patients. Differences and discriminatory value. *Dis Colon Rectum* 1990; 33:479-485.
  14. Bartram CI, Sultan AH. Anal endosonography in faecal incontinence. *Gut* 1995; 37:4-6.
  15. Rociu E, Stoker J, Eijkemans MJ, et al. Fecal incontinence: endoanal US vs endoanal MR imaging. *Radiology* 1999; 212:453-458.
  16. Briel JW, Stoker J, Rociu E, et al. External anal sphincter atrophy on endoanal magnetic resonance imaging adversely affects continence after sphincteroplasty. *Br J Surg* 1999; 86:1322-1327.
  17. Read M, Read NW, Barber DC, et al. Effects of loperamide on anal sphincter function in patients complaining of chronic diarrhea with fecal incontinence and urgency. *Dig Dis Sci* 1982; 27:807-14.
  18. Locke GR, Pemberton JH, Phillips SF. AGA technical review on constipation. *Gastroenterology* 2000; 119:1766-1778.
  19. Heyman S, Jones KR, Ringel Y, et al. Biofeedback treatment of fecal incontinence: a critical review. *Dis Colon Rectum* 2001; 44:728-736.
  20. Halverson ALMD, Hull TLMD. Long-term outcome of overlapping anal sphincter repair. *Dis Colon Rectum* 2002; 45:345-348.