Fecal Incontinence

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ABSTRACT

Fecal incontinence is a devastating problem for those afflicted. It can lead to embarrassment and social isolation. Treating the problem begins with a thorough history and physical examination. Further testing (such as anal physiology testing or anal endosonography) depends on the examination and treatment plan. Conservative medical therapies (such as dietary manipulation, medication to slow the stool, and biofeedback) are usually tried first. Surgery includes sphincter repair, SECCA, artificial bowel sphincter, and stoma. New therapies continue to evolve with the intention of further improving quality of life for these afflicted patients.

KEYWORDS: Fecal incontinence, sphincteroplasty, artificial bowel sphincter, SECCA, anal physiology

Objectives: On completion of this article, the reader should be able to: (1) outline the pertinent questions and physical examination pointers for patients with fecal incontinence; (2) discuss nonsurgical treatment including medical management and biofeedback; (3) list surgical options and recognize when to choose which option; and (4) name a type of therapy currently being studied that looks encouraging for improvement of fecal incontinence.

Fecal incontinence is the involuntary loss of flatus or any form of stool. The problem can range from mild incontinence of flatus to loss of an entire bowel movement. With this in mind, there can be incontinence in which the person is unaware of the stool loss, which is termed “passive incontinence,” and incontinence in which people have severe urgency and lose stool while frantically trying to reach a toilet, termed “urge incontinence.” These two types can occur in combination or separately. Urge incontinence may also be associated with some element of irritable bowel syndrome. It is also useful to categorize fecal incontinence by thinking of factors above the sphincter complex that are contributory. For instance, a noncompliant rectum or loose stool could overwhelm an intact sphincter that would otherwise function acceptably.

Fecal incontinence can be devastating and lead an afflicted person to resist leaving home or the comfort of a close toilet. Alternatively, some patients alter their eating

patterns so that they can assure themselves that they will not need to defecate while performing necessary duties outside the home such as grocery shopping. Because fecal incontinence is not life threatening, the implications for quality of life and alterations in lifestyle need to be questioned when caring for these patients.

The number of patients afflicted is really unknown. This is in part due to lack of a precise definition and patients’ embarrassment about discussing the problem with health care providers. In a community population-based random survey in Wisconsin, 2.2% of the population reported fecal incontinence. Of these, 30% were older than 65 years and 63% were female. When considering the type of incontinent material, 36% were incontinent to solid stool, 54% to liquid stool, and 60% to flatus.¹ Nelson did a comprehensive literature review to report that fecal incontinence approaches 50% of nursing home residents and seems almost as common in men as women.² His review demonstrated a wide

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prevalence of fecal incontinence as reported in multiple papers spanning many countries. It was found to be as low as 0.4% in women aged 15 to 64 from the United Kingdom to 54% of nursing home residents in Italy and Czech Republic. Therefore, it appears that this is a significant problem, but the scope is not totally clear.

ETIOLOGY

Defecation is a complex process involving the interplay of multiple factors. Trauma to the pelvic floor during childbirth is a commonly cited factor. In one study that compared vaginal delivery with elective cesarean section, a severe tear in the sphincter complex was associated with fecal incontinence when the women were studied 3 months after delivery. Occult tears did not have prolonged short-term effects, but the authors conceded that the long-term effects after muscles undergo normal aging were unknown.³

Other cited factors that lead to fecal incontinence include anorectal surgical alteration of the sphincter complex, other traumatic injuries to the pelvic floor and sphincter complex, neurological disorders or other conditions that lead to pelvic floor weakness, congenital malformations, and chronic diseases that alter the stool or rectal reservoir (inflammatory bowel disease, diabetes, multiple sclerosis, dementia).⁴ Nelson stated that the most commonly cited factor is prior obstetrical trauma, followed by irritable bowel syndrome and neurological disorders associated with diseases such as diabetes.² He pointed out that in all population-based studies there is a high prevalence of fecal incontinence in men and questioned the exact etiology leading to the discrepancy in the cited factors and population-based studies.

As stated before, it is important to think about all aspects of the complex interactions that contribute to defecation, such as damage to the sphincter complex; although important, this may be just one contributing part.

EVALUATION

A comprehensive history is the initial step in evaluation. Patients may be embarrassed to discuss their problem, and it may be necessary to coax the information from them. Precisely what is meant by fecal incontinence is an ideal place to start. The duration, frequency, and consistency of lost stool or gas, or both, are key questions. Association with meals, urgency, pad use, related medical and surgical history, and for women obstetrical history add valuable information. Review of medications is important as some may alter stool consistency and predispose to incontinence problems. For women, associated pelvic floor problems during childbirth may have occurred. One third of women with urinary incontinence are found to have fecal incontinence.⁵ Those with

urinary incontinence or vaginal prolapse, or both, may benefit from evaluation by an urologist or urogynecologist, and, if appropriate, combined surgery for both problems simultaneously may be considered.

The impact on quality of life is more difficult to assess. Patients may alter their lifestyle patterns to avoid "an accident," but these details are more difficult to delineate.

There are many tools available to examine the degree of incontinence and its impact on quality of life. There is no universally accepted or used tool, and all have drawbacks. Understanding the various types may help the health care provider to decide which tools meet the goals. Incontinence grading scales assign numerical scores to the degree of incontinence. They lack the ability to consider frequency and are thought to be imprecise especially to small changes, which may be clinically important. Summary scores attempt to look at various aspects including frequency along with characterization of the incontinent stool consistency. In addition, tools that look at how the incontinence affects quality of life are another method of evaluation. Baxter et al presented a comprehensive summary of these types for further review.⁶ In short, no tool is perfect and many are more suited for research purposes. For the practicing clinician, comprehensive questioning provides the needed information.

The physical examination focuses on the perineum. Looking at the undergarments may reveal stool streaking or loss. The perineum is examined for scarring and anal gapping. Looking visually at the perineum while the patient strains and squeezes and then repeating this sequence during a digital examination provide information about the movement and function of the pelvic floor. An assessment for masses, fistula, or rectocele is performed during digital rectal examination. A visual examination of the rectum by proctoscopy or flexible sigmoidoscopy may reveal inflammation. For those older than 50, a screening examination of the entire colon should be considered.

Further testing depends on the course of treatment and findings on physical examination. It includes anorectal manometry, pudendal nerve terminal motor latency testing, defecography, and anal endosonography. Anorectal manometry measures resting and squeeze pressures, reflecting pressures generated roughly by the internal and external sphincter, respectively. Compliance of the rectum is calculated by rectal distention with a balloon, and pudendal nerve terminal motor latency can also be calculated using nerve stimulation. Unfortunately, it does not appear that any single variable can predict the outcome after sphincter repair.⁷ Although none of these are mandatory, they can provide baseline information and allow the clinician to adjust prognostic information regarding surgical intervention. For instance, a rectum that is stiff with low compliance may

reflect a potentially poor rectal reservoir and thus lead to suboptimal improvement after sphincter repair. Similarly, impaired bilateral pudendal nerve terminal motor latency may make improvement after a sphincter repair less than expected.

Defecography examines rectal emptying and would be ordered before treatment decisions for patients suspected of having issues related to emptying of the rectum such as a rectocele or rectal prolapse.

Anal endosonography is the preferred technique for evaluation of the anal sphincter structure and delineating internal and external sphincter defects. When comparing findings from endosonography with surgery, accuracy in experienced hands approaches 100%.⁸ Thus, if any further testing is preferred, it is usually anal endosonography.

TREATMENT

After all data from the history, physical, and supporting testing are reviewed, an individualized treatment plan is outlined. Treatment is always initiated after balancing the degree of impairment and effect on quality of life versus the risk of the treatment.

Nonsurgical Treatment

If possible, underlying medical conditions are initially addressed. These could include changing medications, which may have loose stools as a side effect; treating inflammatory bowel disease; and treating anorectal conditions that predispose to mucous soiling (e.g., prolapsing hemorrhoids, fistula, mucosal prolapse).

Minor to moderate incontinence may improve with changing the consistency of the stool. Fiber agents may improve the ability to sense stool and thus control it. Gradually increased doses of psyllium or methylcellulose may improve stool bulk.⁴ Stool frequency can be decreased with loperamide or diphenoxylate with atropine (Lomotil). Even in patients without diarrhea, making the stool firmer and slowing the transit can improve stool control. Dosing of these medications is individualized depending on the pattern of incontinence. Daily dosing is appropriate in selected patients.⁴

For patients who leak a small volume of stool up to several hours after defecation, a small volume tap water enema is useful to clean out the rectum and eliminate retained stool and mucus.

There is some evidence that amitriptyline decreases intrarectal pressure leading to improved incontinence, probably in the subgroup with impaired compliance. In an open study using 20 mg daily for 4 weeks, 89% had improvement in fecal incontinence.⁹

Biofeedback and pelvic floor exercises are used to improve fecal incontinence. Motivated patients and therapists are essential. The goal is to improve external

sphincter strength, coordination of increased sphincter tone in response to rectal distention, and improved sensing of stool in the rectum. Studies are difficult to compare because of lack of uniform reporting concerning the exact method and duration of biofeedback. In a Cochrane review published in 2000, only five studies were eligible for evaluation.¹⁰ These studies were not ideal and suggested that rectal volume discrimination training improved incontinence over sham training. Long-term improvement has been reported. One study with a median follow-up of 42 months found that 75% of patients had symptomatic improvement and 83% reported improved quality of life.¹¹

Biofeedback may have benefit after sphincter repair if the results are not as optimal as anticipated. There are studies that have demonstrated improvement with biofeedback in this type of situation.^{12,13}

Not all studies show optimism for biofeedback. Norton et al¹⁴ randomly allocated 171 patients in a study comparing four groups: (I) teaching, advice, and support (a), (II) + addition of sphincter exercises (a + b), (III) + addition of manometric feedback (a + b + c), and (IV) + addition of a home training device (a + b + c + d). Surprisingly, continence scores, disease-specific and generic quality of life scores, resting, squeeze, and sustained squeeze pressures improved in all groups and improvement was maintained at 1 year. The presence and degree of a sphincter defect did not correlate with outcome. Therefore, this study suggests that specific counseling and advice may be very helpful in improving patients without intensive biofeedback.

Surgical Treatment

SPHINCTER REPAIR

Because obstetrical trauma with sphincter defects is a common etiology of fecal incontinence, direct sphincter repair is an initial treatment plan. For obstetrical injury the incision is made over the perineal body, but for those with defects in the muscle from fistulotomy, sphincterotomy, or traumatic muscle injury, the incision is placed over the divided muscle. Because most patients present to the surgeon after the muscle has been injured or intentionally divided, it is important to wait a sufficient length of time for the tissue to become soft and supple before attempting a repair. Most centers mobilize the ends and perform an overlapping repair. The internal sphincter and external sphincter are overlapped in bulk and not separated. Initial results were optimistic for improvement, but with increased awareness regarding accurate assessment and long-term follow-up, the degree of improvement is less encouraging. Table 1 summarizes studies with longer follow-up. Reading each study, some specific things also become apparent. In the St. Marks study,¹⁵ 76% of patients were continent of solid and liquid stool at a

Table 1 Long-Term Results of Overlapping Sphincter Repair

Place/year	Number of Patients	Follow-Up Average (months)	Totally Incontinent (%)	Incontinence of Flatus Only (%)	Totally Continent (%)
St. Marks, 2000 ¹⁵	38	77	89	11	0
France, 2000 ¹⁶	74	40	49	23	28
Cleveland Clinic Foundation, 2002 ¹⁷	49	69	54	32	14
University of Minnesota, 2004 ¹⁸	104	120	77	17	6

mean of 15 months postoperatively. This significantly decreased to 0% of patients totally continent at an average of 77 months of follow-up. In addition, 36% reported a new evacuation disorder after sphincter repair.

A valid criticism is that most studies were not prospective. However, a French study¹⁶ was prospective and also used anal endosonography to assess the adequacy of repair. Poorer results were associated with persistent internal sphincter defects.

At 3 months with 86 patients, 48% were totally continent and 19% totally incontinent. The percent totally continent was substantially decreased at a longer follow-up of 40 months.

A study from the Cleveland Clinic¹⁷ found that even though only 14% were totally continent, 34% had the highest attainable score in the American Society of Colon and Rectal Surgeons quality of life tool.

A study from the University of Minnesota¹⁸ was a follow-up to published results at an average of 3 years from sphincter repair. They found significantly worse results from 3 years to 10 years. Predictors of a poor outcome were older age and fecal incontinence at the 3-year assessment.

One randomized study questioned the need for an overlapping repair versus end-to-end apposition. Similar outcomes with both repairs were found at median follow-up of 18 months,¹⁹ with a suggestion of new evacuation problems and prolongation of the pudendal nerves in the overlapping group.

In short, overlapping repair should be considered for patients with a sphincter defect as the first line of surgical therapy at this time. One interesting postoperative result that deserves further study is dyspareunia after sphincter repair. There is minimal literature concerning this postoperative problem, which requires more attention in the future. Regarding surgical repair, patients should also be counseled about the possibility of failure along with deterioration of function in the long term. Patients who fail to improve should be evaluated for persistent defects, and the literature supports rerepair if the tissue is favorable.²⁰

ARTIFICIAL BOWEL SPHINCTER

Implanting an inflatable cuff wrapped around the anus connected to a pump (in the labia in women and scrotum in men) and a storage reservoir balloon in the space of Retzius creates a system that allows restoration of con-

tinence for solid and liquid stool. The system is modeled after the implantable urinary incontinence device. The device has been reported to be significantly effective in reducing incontinence scores by 75%.²¹⁻²⁴ The major drawback is explantation related to erosion, infection, or malfunction. Explantation rates vary, but Lehur and colleagues have published three consecutive series in 1998, 2000, and 2002 and the explantation/revision rates have remained constant at 31%, 29%, and 31% respectively.²²⁻²⁴ This leads to a conclusion that even after the learning curve has been reached, there exists about a 30% chance of explantation for various reasons. However, once the artificial sphincter has stabilized, Parker et al found its function and improvement in fecal continence remained persistent for many years.²⁵ Hence, even with the potential for complications, mortality is low, and with the only alternative usually a stoma, the artificial bowel sphincter should still be considered a viable choice in selected patients.

SECCA

The SECCA procedure is a relatively new minimally invasive procedure approved in the United States by the Food and Drug Administration for the treatment of fecal incontinence. It involves a device that uses radio-frequency energy through ~64 specialized electrode needle points in the anal canal with the needles penetrating into the muscle to deliver the energy and achieve a temperature of 85°C for 1 minute. It is believed that over time the deposition of collagen and remodeling of the tissue lead to improvement in fecal incontinence. The SECCA procedure is usually performed on an outpatient basis under conscious sedation. It is necessary to procure the equipment from the company to perform the procedure. A sham-controlled crossover study in the United States has been completed and results are pending complete follow-up. In a published multicenter study with 6 months follow-up,²⁶ there was significant improvement in the Wexner incontinence score from 14 to 11. One critique was that with this score, 20 is totally incontinent and 0 is totally continent; thus, the significance of a change from 14 to 11 is unclear. However, all parameters in a fecal incontinence quality of life scale improved significantly. There were few side effects and no serious complications. Therefore, for appropriate patients with an intact muscle and without anal sepsis, collagen vascular disease, inflammatory bowel disease, or

history of anal radiation, the SECCA procedure would be a viable option. The future of this procedure remains uncertain because the company that makes the device declared chapter 7 bankruptcy at the time of this writing.

POSTANAL SPHINCTER REPAIR

The postanal repair was devised to increase the length of the anal canal and was suggested for patients with an intact sphincter but perhaps with nerve damage. Few long-term follow-up studies exist in the recent literature. One study found that at an average of 3 years, 35% of patients had significant improvement.²⁷ All patients had preoperative anal endosonography. No preoperative factor or variable tested was found to influence the results. The authors thought that this type of surgical therapy should be offered to selected patients. In another study, long-term results were obtainable for 44 of 61 patients operated on from 1994 to 2001; 68% continued to have significant improvement and 14% were the same or worse.²⁸ In a study comparing patients who improved after surgery with those who did not, the only finding was that symptomatic patients had significantly greater posterior pelvic floor weakness. Anal physiology was the same in both groups.²⁹

The postanal repair has never enjoyed popularity in the United States. It can be considered in patients with fecal incontinence and an intact sphincter with no other options except a stoma. It has been suggested that

in patients with an internal sphincter injury from the circular stapler after an anterior resection, it may improve incontinence problems and should also be considered in this selected situation.³⁰

MUSCLE TRANSPOSITION

Mobilization of the gracilis muscle from its attachment at the knee and wrapping it around the anus was proposed for patients with fecal incontinence. It was found that an implantable electric pulse generator could convert this fast-twitch muscle to a slow-twitch fatigue-resistant muscle and improve results.³¹ It continues to be proposed outside the United States for patients with congenital malformations or significant loss of sphincter muscle.³² The success rate has been reported as 42 to 85%, but the high complication rate³³ has relegated it to centers with considerable experience. In the United States, the electric pulse generator is no longer available, and thus this procedure is not performed.

ILEOSTOMY/COLOSTOMY

For some patients with intractable fecal incontinence that prohibits any acceptable quality of life, a stoma is a reasonable alternative. However, before committing a patient to a permanent stoma, consideration should be given to referral to a center that specializes in the treatment of fecal incontinence. Over the past 10 to 15 years several new therapies have become available,

Table 2 Summary of Available Treatment Options for Fecal Incontinence in the United States

Treatment	Comments	Suggested Results
Fiber and medications to slow down the bowel	Always treat diarrhea first. Sometimes thickening the stool improves bowel control significantly	
Biofeedback	Requires motivated patient and therapist; advice and support may be just as beneficial	May have up to 75% symptomatic improvement
Anal sphincteroplasty	For patients with an anterior sphincter defect usually from obstetrical trauma	Studies have shown that 50–89% are totally incontinent at long-term follow-up
Postanal repair	For patients with intact sphincter and perhaps neurological injury; also after internal sphincter injury from circular stapler for low anastomosis	35–68% reported improvement
SECCA	For those with an intact sphincter	In one study the (Wexner) incontinence score decreased from 14 to 11 (20 = totally incontinent and 0 totally continent)
Artificial bowel sphincter	Usually for those with congenital malformations, although patients who have failed other therapy and have an intact sphincter or traumatic damage may benefit. Complication rate even after learning curve is reached remains at ~30%	Those who do not have device complications can expect 75% improvement in their continence scores
Stoma	For those who do not have improved quality of life after other treatments or who do not qualify for other treatments	

and more are in the testing stages. Specialty centers may tend to have more experience in some of the newer therapies that may improve patients' conditions. Table 2 summarizes the available treatment options.

New Therapies

SACRAL NEUROMODULATION

Tremendous enthusiasm has been generated by the success of treating various pelvic floor problems with sacral neuromodulation. It is already approved in the United States for urinary incontinence, and approval for use in fecal incontinence is pending a multi-institutional study. Used in many countries outside the United States for fecal incontinence and dysfunctional pelvic floor problems, it is performed in two stages. The first involves placing a lead into the sacral foramen, usually S3, and attaching it to a temporary stimulator. If 50% improvement is achieved, a permanent pacemaker is implanted that looks very similar to a cardiac pacemaker.

In a comprehensive review by Matzel et al of single-center and multicenter reported results, the number of incontinence episodes weekly dropped from 8–11 to less than 1 in many studies with follow-up in one series over 5 years.³⁴ Complications ranged from 0 to 50%, but looking at intention to treat analysis, therapeutic success was reported as 80 to 100%. If these results hold up, this modality could represent a major breakthrough in our ability to treat fecal incontinence effectively in the future.

INJECTABLE AGENTS

In an attempt to improve internal anal sphincter dysfunction, injectable agents have been developed. No single agent has been approved for use in the United States. However, those currently under evaluation include carbon-coated beads³⁵ and injectable silicone.³⁶ To avoid anal pain and erosion of the implanted material, injection is into the intersphincteric plane. One study found that at a mean follow-up of 28 months the Cleveland Clinic Fecal Incontinence score improved from 11.9 to 8.³⁵ Further long-term study is needed.

CONCLUSION

Fecal incontinence is a devastating problem for those afflicted. It can lead to embarrassment and social isolation. Many patients can be improved, but awareness that there are treatment options and a careful evaluation are needed to decide on the best treatment plan. This entails a careful history and physical examination. Further testing depends on the examination, age of patient, and treatment plan. Conservative medical therapy is usually tried first. If there is no improvement, further testing and surgical options are considered. Over the past

10 to 15 years, significant advances have been made in new treatment options and scientific study of the problem and its manifestations. Even with this advancement, considerable work is still needed to offer patients with fecal incontinence a chance at quality life.

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