Context: Although success rates are limited, anal sphincteroplasty is commonly used to treat women with fecal incontinence.

Objectives: To investigate the long-term efficacy of a novel surgical procedure—sphincteroplasty with perineal reconstruction—for the management of fecal incontinence.

Methods: The current prospective study comprised women presenting to the Division of Urogynecology and Reconstructive Pelvic Surgery at Riverside Methodist Hospital in Columbus, Ohio, with fecal incontinence and anterior external anal sphincter disruption. Endoanal ultrasonography was used in the presurgical evaluation of anal sphincters. Sphincteroplasty was completed in an end-to-end manner and perineoplasty in a standardized fashion.

Results: Twenty women participated in the present study. Four patients (20%) had prior surgery (sphincteroplasty or rectocele repair) for fecal incontinence. Before surgery, 15 patients (75%) were incontinent of solid stool, and all 20 patients had incontinence of liquid stool and flatus. The mean number of incontinence episodes was 3 per week (range, 1-8 per week). At 3-year postsurgical follow-up, all 20 patients were continent of solid stool, 18 (90%) were continent of liquid stool, and 10 (50%) were continent of flatus.

Conclusion: Based on the results of this pilot study, anal sphincteroplasty with modified perineoplasty appears to have acceptable long-term results for the treatment of women with fecal incontinence and anatomic anal sphincter defects.

Fecal incontinence is defined as the involuntary passage of anal material through the anal canal at any time after completion of toilet training. It is a socially and psychologically distressing condition that affects an estimated 5.5 million people in the United States. One study estimated that 1 in 10 women nationwide have fecal incontinence, with 1 in 15 having moderate to severe fecal incontinence.

However, reluctance to discuss the subject—on both sides of the patient-physician relationship—and a lack of understanding of the pathophysiology and available treatment options has caused this troubling condition to remain underreported and undertreated. Johanson and Lafferty found that roughly 70% of patients with fecal incontinence had never discussed it with a physician. Therefore, the true prevalence of this condition is difficult to determine.

In a 1993 survey of US households, 7.1% of the general population reported some degree of fecal incontinence. Among patients with urinary incontinence and pelvic organ prolapse, the prevalence of fecal incontinence is as high as 30%. In addition, an estimated 13% to 47% of hospitalized elderly patients and nursing home residents are affected. Fecal incontinence is the second most common reason for institutionalization of elderly adults and helps account for the more than $4 million spent annually on adult diapers in the United States.

Fecal continence is dependent on the complex coordination of several muscles, intact neural pathways and cognition, distensibility of the rectum, and stool volume and consistency. When an anatomic defect in the anal sphincter complex is identified, surgical correction is a viable option. Sphincteroplasty is currently the mainstay of treatment options and is typically used in isolation. Long-term success rates, however, are disappointing, with more than half of patients reporting incontinence of liquid or solid stool at long-term follow-up.

The purpose of the present pilot study was to evaluate the efficacy of a novel surgical approach to manage fecal incontinence. The procedure used in the current study consisted of anal sphincteroplasty in combination with a modification of a previously described perineal reconstruction. To our knowledge, the present report is the first to describe the combination of these surgical options for the management of fecal incontinence.

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Submitted February 12, 2008; revision received June 30, 2008; accepted July 15, 2008.
Methods

The institutional review board at Riverside Methodist Hospital in Columbus, Ohio, reviewed and approved the study protocol. Signed informed consent was obtained from all patients.

Data were collected prospectively to evaluate surgical outcomes of 20 consecutive women with complaint of fecal incontinence presenting to the office of a urogynecologist (J.M.N.) at the hospital. Patients were included in the study if they were aged 18 years or older, had an anatomic anal sphincter defect, and had an unsuccessful trial of pelvic floor physical therapy. Patients were excluded if they were unwilling to have a trial of nonsurgical intervention or if they were planning future vaginal childbirth.

All patients had a thorough urogynecologic evaluation before surgery. The evaluation included medical history, physical examination, Pelvic Organ Prolapse Quantification examination, and complex urodynamic testing when appropriate. Patients were assessed for fecal incontinence using standard history-taking techniques. In other words, patients were questioned regarding the frequency and consistency of bowel movements, duration and severity of fecal incontinence, use of protective undergarments, and outcome of previous interventions, if applicable.

Anal sphincter defects were documented on physical examination and confirmed by endoanal ultrasonography. All patients underwent a trial of pelvic floor physical therapy before consideration for surgery.

All subjects had perineoplasty in conjunction with other pelvic reconstructive procedures. Perineoplasty was performed in a standardized fashion, which has been more fully described elsewhere. One surgeon (M.A.M.) provided surgical intervention for all 20 subjects.

For the combined perineoplasty and sphincteroplasty procedure, the perineum and posterior vaginal wall were dissected to expose the anterior surface of the rectum and the muscles of the perineum. The disrupted external anal sphincter was identified and the ends were exposed with sharp dissection. The external anal sphincter was reapproximated in an end-to-end fashion with three or four simple interrupted sutures using standard uncoated 0 Vicryl (Ethicon Inc., Somerville, NJ). The superficial transverse perineal muscles, the perineal membrane, and the bulbocavernous muscles were reattached to the anterior surface of the external anal sphincter with simple interrupted 0 Vicryl sutures, thereby recreating the central tendon of the perineal body. The posterior vaginal wall and perineal skin were reapproximated with continuous subcuticular suture of 2 and 0 Vicryl, respectively.

Subjects were evaluated at 6 months and at 1, 2, and 3 years postsurgery. At each follow-up visit, subjects were questioned regarding symptoms of fecal incontinence. They were assessed for anal prolapse using the Pelvic Organ Prolapse Quantification system. Physical examination was used to document the integrity of the external anal sphincter and perineal musculature.

Results

Demographic data are summarized in Table 1. Before surgery, 15 women (75%) reported incontinence of solid stool, while all subjects reported incontinence of liquid stool and flatus. The number of incontinence episodes per week ranged from 1 to 8, with a mean of 3. Four patients (20%) had prior surgery for fecal incontinence—3 (15%) had anal sphincteroplasty and 1 (5%) had rectocele repair.

All 15 patients who reported incontinence of solid stool before surgery were continent of solid stool 3 years postsurgery. Two (10%) of 20 patients remained incontinent of liquid stool at 3-year follow-up, for a success rate of 90%. At 6-month follow-up, 14 patients (70%) had continence of flatus, and 10 (50%) were continent of flatus 3 years after surgery (Table 2).

Comment

As described earlier, fecal continence relies on a complex interplay of nerves, muscles, and gastrointestinal function. Anatomic abnormalities of the anal sphincter have traditionally been repaired with an anterior anal sphincteroplasty, either in an end-to-end or overlapping technique. However, long-term outcomes for these surgical interventions have been disappointing.

In comparison with previous reports of anterior anal sphincteroplasty, results of the present investigation are favorable. The 3-year outcomes with regard to continence of solid and liquid stool suggest good durability of a combined sphincteroplasty and perineoplasty. Because incontinence of flatus is difficult to cure in the setting of anal sphincter disruption, it is

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**Table 1**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (range)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>48 (32-70)</td>
</tr>
<tr>
<td>Race, No. (%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>15 (75)</td>
</tr>
<tr>
<td>Black</td>
<td>5 (25)</td>
</tr>
<tr>
<td>Medical History</td>
<td></td>
</tr>
<tr>
<td>Incontinence</td>
<td></td>
</tr>
<tr>
<td>Duration, y</td>
<td>10 (1-25)</td>
</tr>
<tr>
<td>Episodes per week</td>
<td>3 (1-8)</td>
</tr>
<tr>
<td>Previous surgery, No. (%)</td>
<td></td>
</tr>
<tr>
<td>Anal sphincteroplasty</td>
<td>3 (15)</td>
</tr>
<tr>
<td>Rectocele repair</td>
<td>1 (5)</td>
</tr>
<tr>
<td>Parity</td>
<td>2 (1-5)</td>
</tr>
</tbody>
</table>

* Data are reported as mean (range) unless otherwise noted.
not surprising that the continence rate declined between 6 months and 2 years.

The present pilot study has certain limitations. For example, the lack of a control group and small number of patients limit the strength of our results. In addition, subjects were predominantly white and the numbers are too small to detect a difference between populations by race. Therefore, the results may not be generalizable.

However, based on the outcomes observed in the present pilot investigation, we believe that sphincteroplasty with modified perineoplasty is an improvement on the existing standard of care, anal sphincteroplasty. The reattachment of the perineal musculature to the anal sphincter complex and the distal levator muscles re-establishes the coordinated function of this unit. This combined procedure demonstrated favorable long-term results in the surgical management of fecal incontinence caused by anatomic anal sphincter defects.

Conclusion
The present pilot study was undertaken to determine the long-term efficacy of combined anal sphincteroplasty and perineal reconstruction. Based on the encouraging results of the current investigation, a larger trial with longer follow-up is warranted.

References