Audit of Sphincter Repair

Factors Associated with Poor Outcome

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PURPOSE: This study was designed to critically analyze the outcome of sphincter repair and, if possible, to identify high-risk factors. METHODS: Clinical and physiologic assessment was made of all sphincter repairs (42 patients) performed in one unit by two surgeons during five years. RESULTS: Forty-two patients (10 men, 32 women) underwent sphincter repair. Only three of five men with anterior defects of the anorectum from perineal trauma were rendered continent. Only three of five men with defects from fistula operations became continent, but one improved by later graciloplasty. All six women with fistula-related injuries eventually achieved continence, but two required repeat sphincter repairs because of early breakdown from sepsis. The worst results were in 26 women with third-degree obstetric injuries, of whom 11 remain incontinent; poor results in this group were associated with gross perineal descent, obesity, and age older than 50 years; two or more of these factors indicated a poor outcome. Preoperative anorectal physiology did not identify a poor-risk group. CONCLUSIONS: Poor results were identified in women with anterior defects from obstetric trauma, especially if they were obese, older than 50 years of age, and had perineal descent. [Key words: Sphincter repair; Sphincter injury; Incontinence; Postobstetric damage; Prognostic factors; Obesity; Age greater than 50 years; Perineal descent]

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Sphincter repair has been widely practiced in specialist coloproctologic units for the last two decades.[1, 2] Results generally report return of continence in 70 to 80 percent of patients.[3-7] Unfortunately, most articles do not distinguish subgroups of sphincter injury.[8-10]

One subgroup is patients of either sex with sphincter injuries associated with perineal and pelvic trauma,[6] often following road traffic accidents or impalement injuries of the perineum. Most of these patients have an anterior defect, and injury is rarely if ever confined to the sphincters because usually there is coexisting rectal trauma, urethral injury, and pelvic fractures. Consequently, most of these patients have a colostomy raised soon after their initial admission. Two further subgroups comprise men or women with sphincter defects following operations for fistula-in-ano. We believe the sexes should be considered separately because some women also have compromised sphincter and pelvic floor function from obstetric trauma, and thus prognosis may be less certain. Another subgroup consists of women with third-degree tears resulting in anterior sphincter deficiency. However, most of these patients have a history of prolonged labor, often necessitating assisted delivery; as a consequence, there are features of pudendal neuropathy (prolonged latency and impaired anal sensation) and deficiency in the anterior aspect of the pelvic floor.[11, 12]

PATIENTS AND METHODS

We analyzed results of sphincter repair in all patients who underwent surgery during the five-year period from April 1989 to April 1994. Follow-up ranges between 12 and 66 (median, 38) months. There were 42 patients: 5 were men with severe anterior anorectal trauma, associated with pelvic fractures (3 cases with urethral injury), all of whom were initially treated by raising a proximal stoma (median age, 41 (range, 22–53) years); 5 men had repairs for iatrogenic injuries after fistula operations (4 posterior and 1 lateral defects; median age, 44 (range, 35–52) years), 6 parous women had postfistula injuries (3 prolonged labor), (4 anterior and 2 lateral defects; median age, 37.5 (range, 27–50) years); 26 women had anterior defects following severe obstetric trauma (3 previous sphincter repairs; mean age, 47.9 (range, 23–83) years).

All patients were assessed clinically; 40 had preoperative anorectal physiology, but only 27 agreed to anorectal physiology postoperatively. Physiology included anal manometry, anal and rectal sensation, and pudendal nerve latency and perineal descent. Anal ultrasound was only available from 1991 forward and replaced electromyographic mapping as a means of identifying site of sphincter deficiency. Techniques of anorectal physiology were previously described.[13]

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Table 1.
Functional Score

Score Incontinence	Solid	Liquid	Soiling	Other
1	None	None	None	No urgency
2	None	None	None	Urgency
3	<1/month	Occasional	Minor	
4	<1/week to >1/month	Frequent	Major	
5	>1/week but not daily			
6	Daily		Aware of defecation	
7	Daily		Unaware of defecation	

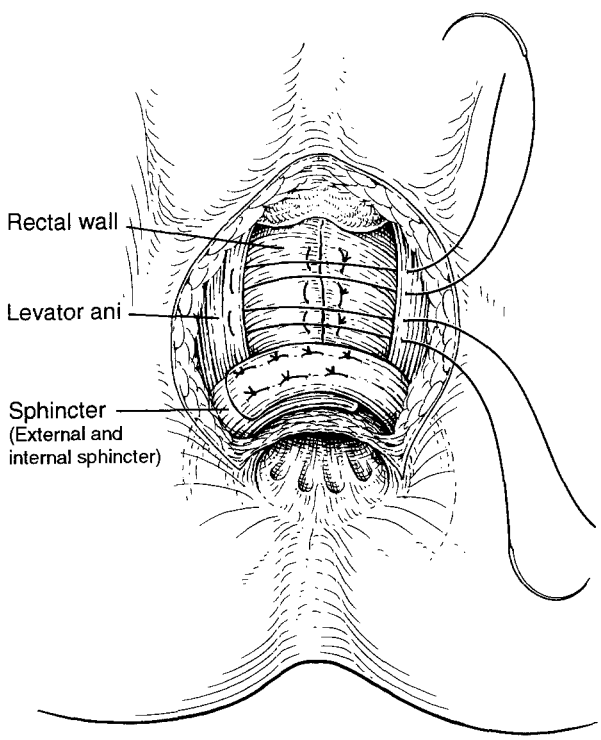

Figure 1. Anterior rectal repair; sphincter reconstruction for trauma with patient in the lithotomy position.

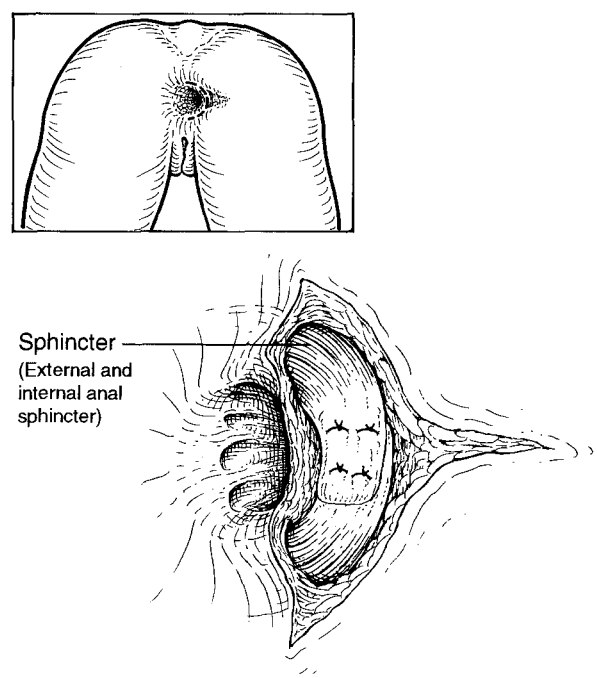

Figure 2. Lateral sphincter repair for a fistulotomy defect; prone jackknife position.

The same incontinence score (Table 1) was used before and after the operation.

Repair depended on type of injury. All patients with severe pelvic and perineal trauma had a covering colostomy at their first admission. In the lithotomy position, damaged rectum was carefully dissected from the perineum and back of the prostate, taking great care not to injure the urethra or buttonhole the rectal mucosa. Usually, the deficient anterior rectal wall required a buttress repair. Sphincters were then reconstructed using a flap-over repair technique with an anterior levatorplasty to reconstruct the perineal body (Fig. 1). The prone jackknife position and a circumanal incision were used for lateral sphincter defects; healthy sphincter muscle on either side of the defect was identified, scar tissue was divided, and a flap-over repair was performed, leaving part of the wound open for drainage (Fig. 2). Posterior fistula defects were approached in a similar manner, often in combination with postanal repair (Fig. 3).

Anterior sphincter defects were all approached in the prone jackknife position using a cruciate incision. The entire rectovaginal septum was dissected to the level of the pelvic peritoneum. Levators on both sides were identified and closed in the midline, a flap-over sphincter repair completed, and skin incision was closed as a Z-plasty (Fig. 4).

RESULTS

Overall results were somewhat disappointing (Table 2), with 17 patients (40 percent) initially having

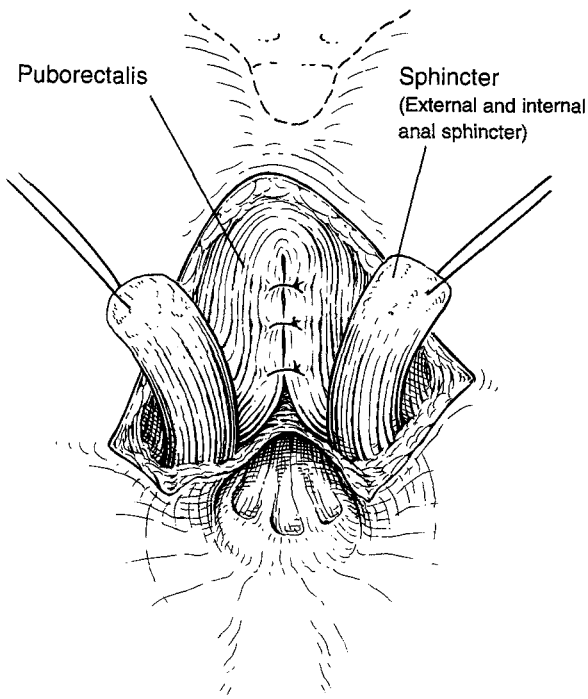

Figure 3. Posterior sphincter repair for a fistulotomy defect; prone jackknife position.

persistent incontinence (10 incontinent of solids, 7 incontinent of liquids), leaving only 25 patients (60 percent) who were continent. Two women with poor results after repair for a fistula defect complicated by sepsis (1 lateral, 1 anterior) had a second sphincter repair with considerable improvement (1 perfect continence, 1 soiling only). Two men, also with a postfistula injury, had an unsuccessful repair, but subsequently one of them was rendered completely continent by nonstimulated graciloplasty. Thus, final results left 14 incontinent (33 percent; 8 incontinent of solids, 6 incontinent of liquids) and only 28 (67 percent) continent.

Men with anorectal trauma had a particularly poor outcome, two having such a poor result that a colostomy has been re-established. Results of repair for fistula injury in men were generally satisfactory apart from two initial failures, one corrected by graciloplasty whereas the second still remains incontinent despite subsequent anterior levatorplasty and postanal repair. Reoperation was necessary in two women who were having repair for fistula injury, both because of sepsis; however, repeat repair restored continence in both, and these women are now continent. A different picture emerged, however, for the 26 patients with postobstetric anterior sphincter defects, of whom 11 remain incontinent (42 percent), two of whom are so disabled that they now have a stoma.

We analyzed clinical and physiologic parameters in 26 women with postobstetric injury to further investigate whether any factors might predict a poor clinical outcome (Table 3). Age (more than 50 years) and obesity (body weight exceeding 15 percent of ideal body weight), although more common in women who became incontinent, were not significant predictors of incontinence alone. On the other hand, sharp perineal descent was significantly related to a poor outcome ($P = 0.008$, Fisher's exact probability test). Two or more of these factors combined were significantly associated with persistent incontinence (Fisher's exact test, $P = 0.003$ and $P = 0.02$ for two and three factors, respectively). None of the physiologic measurements identified patients who were likely to remain incontinent in the postobstetric group. In particular, bilateral pudendal neuropathy was of no predictive value.

There was a correlation between preoperative score and postoperative incontinence score (Spearman's correlation, $P = 0.01$). Furthermore patients with a preoperative score of 5 or more had a greater improvement in symptoms than those whose score was 4 or less (Fig. 5), but the difference is not statistically significant. But, as Figure 5 shows, those with a score of 4 or less have a much greater chance of becoming continent (score, 1–2). Thus, 8 of 9 patients with a score of 4 or less became continent, compared with only 6 of 17 achieving continence with a score of 5 or more.

It is conceivable that obesity, age older than 50 years, and perineal descent is simply related to a greater degree of continence before operation than patients without these factors. Thus, we looked at preoperative incontinence scores in these groups and compared them with the rest of the group with postobstetric anterior sphincter injuries. Median and mean preoperative incontinence scores in the 7 obese women (greater than 15 percent ideal body weight) were 3 and 2.6, respectively, compared with 2 and 2.2 for the remaining 19 patients. Median and mean preoperative incontinence scores in the ten women older than 50 years were 2 and 2.8, respectively, compared with 2 and 2.4 in women less than 50 years of age. Median and mean preoperative incontinence scores in the nine women with perineal descent below the ischial tuberosities on straining were 2 and 3, respectively, compared with 2 and 2.3 in the 17 women without gross perineal descent. None of these differ-

Table 2.
Results

Groups	Sex		Site			Result				Reoperation	Satisfactory
						Satisfactory		Unsatisfactory			
	Male	Female	Anterior	Posterior	Lateral	Continent to Liquids/ Solids/ Gas	Only Flatus Incontinence	Incontinent to Liquids	Incontinent to Solids		
Anorectal trauma (5)	5	0	5*	0	0	2	1	0	2†	0	—
Postfistula (11)	5	0	0	4‡	1§	2	1	1	1	2‖	1
	0	6	4*	0	2§	2	2	1	1	2¶	2
Postobstetric (26)	0	26	26#	0	0	10	5	5	6†		
Final results after reoperations											
Anorectal trauma (5)						2	1	0	2†		
Postfistula (11)											
Male (5)						3	1	1	0		
Female (6)						4	2	0	0		
Postobstetric (26)						10	5	5	6†		
Total (42)						19	9	6	8††		

* As in Figure 1.
† Have a stoma (†, 1 patient; ††, 2 patients).
‡ As in Figure 3.
§ As in Figure 2.
‖ Graciloplasty.
¶ Repeat sphincter repair for sepsis-related failures.
# As in Figure 4.

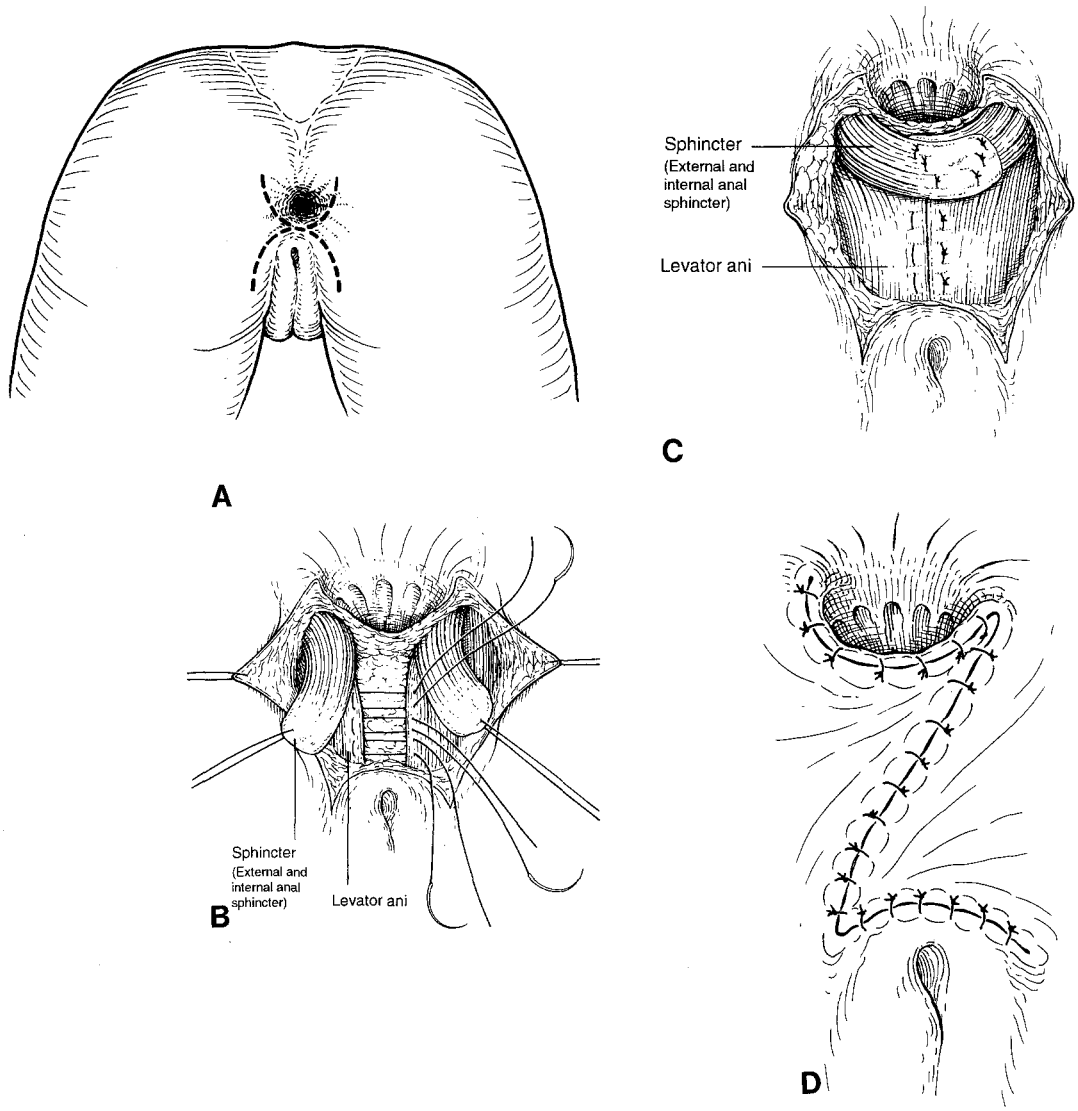

Figure 4. A-D. Sphincter repair and levatorplasty with z-plasty through a cruciate incision for anterior postobstetric sphincter injury; prone jackknife position.

ences are statistically significantly different, although degree of incontinence was slightly worse in all three groups before operations.

DISCUSSION

Our results are, if anything, rather worse than those reported elsewhere.[4, 8, 14, 15] Unfortunately, most studies do not distinguish the different groups of patients with incontinence having a sphincter injury. Severe anorectal trauma and fistula injuries represented a high proportion of the series reported by Browning and Motson,[6] and their results were more encouraging than the 40 percent failure rate observed in this audit. In our experience, the outcome of patients from both sexes with fistula defects was generally satisfactory, even though four of these patients required a second operation. The role of repeat sphincter repair in patients in whom the original repair has broken down because of sepsis has not been addressed in the literature; neither of these patients had a covering stoma; indeed, a covering colostomy is rarely advised for these patients.[7]

The really disappointing results in this audit were among women with postobstetric sphincter injuries, in whom only 58 percent were rendered continent of liquids and solids. Obese women older than 50 years of age and with gross perineal descent appeared to do particularly badly.[16] We accept that in all three groups degree of incontinence preoperatively was slightly more severe than in remaining patients, but differ-

Table 3.
Risk Factors in 26 Women with Postobstetric Injury

	11 Incontinent to Solids/Liquids (%)	15 Continent or Minor Soiling Only (%)
Obesity (>15% of ideal body weight)	5 (45)	2 (13)
Age (>50 yr)	6 (55)	4 (27)
Marked perineal descent (below ischial tuberosities)	8 (73)	1 (7)
One factor	11 (100)	6 (40)
Two factors	7 (64)	1 (7)
Three factors	4 (36)	0
Maximum resting pressure, <50 cm H_2O	5 (45)	6 (40)
Maximum voluntary component pressure, <20 cm H_2O	6 (55)	7 (47)
Anal sensation threshold, >15 mAmp	7 (64)	12 (80)
Pudendal nerve latency, >2.5 ms (both sides)	8 (73)	9 (60)

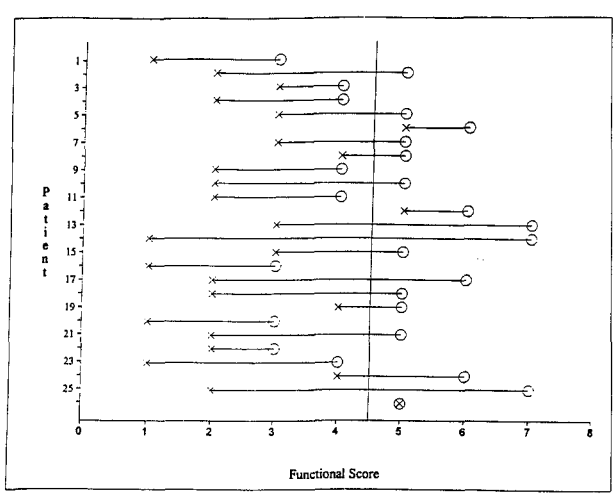

Figure 5. Preoperative and postoperative scores in obstetric trauma group. 0 = preoperative score; X = postoperative score; ⊗ = no change.

ences were not statistically significant. Many of these three high-risk factors were present in the same patients. We believe it would be prudent, in light of these findings, to provide a guarded assessment of likely surgical outcome in these clinical groups to not raise expectations of what may be an unachievable outcome. Unfortunately, preoperative anorectal physiologic investigations failed to identify a group who were likely to remain incontinent. Others report a satisfactory result only in patients without evidence of pudendal neuropathy;[14, 15] however, our data failed to prove this point. On the other hand, there seems to be unanimous agreement that manometric evaluation is of no predictive value.[14, 15] Only 6 of our 26 women with postobstetric injuries had a synchronous colostomy, 2 had a poor result, whereas the remaining four regained continence. Despite this, two other patients had a colostomy raised within a week of operation because of serious sepsis; fortunately, both have had a satisfactory outcome. We believe the role of synchronous defunction should be investigated more carefully, particularly in view of poor overall results in the elderly, obese postobstetric group.[7] Surgical correction should not be denied to patients with severe compromise of continence. Indeed, our data seem to imply that those patients who were suffering with the most severe degrees of incontinence had the best results. These data also imply that those patients with relatively minor degrees of impaired continence should be very carefully counselled before being advised to undergo sphincter reconstruction because the improvement achieved is often less than has been reported for sphincter repair in the past.

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