

Perineal Rectosigmoidectomy in the Elderly

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Between April 1989 and October 1991, 20 consecutive patients underwent perineal rectosigmoidectomy and coloanal anastomosis for full-thickness rectal prolapse. These 16 females and 4 males, with a mean age of 82 (range, 68–101) years, were evaluated by detailed functional assessment and physiologic testing. A grading scale from 0 to 24 was based upon the frequency and type of incontinence, 0 representing full continence. The mean preoperative continence score was 14.5, while the mean postoperative continence score was 8.4. The mean length of resected rectosigmoid was 23 cm. There was one postoperative death and one significant complication, a postoperative pelvic hematoma that required reoperation. There were no full-thickness recurrences at a mean follow-up of 26 months. Six of the 10 patients who underwent preoperative pudendal nerve terminal motor latency (PNTML) testing had evidence of severe neuropathy (latencies greater than 2.5 milliseconds). Prolonged PNTML, however, was not shown to be an accurate predictor of postoperative incontinence because four of the six patients with neuropathy regained excellent to good control. In conclusion, perineal rectosigmoidectomy is a safe operation for the treatment of full-thickness rectal prolapse in the elderly patient. Improved postoperative continence was noted in 90 percent of patients, with improvement seen even in those patients with severe pudendal neuropathy. [Key words: Rectal prolapse; Procidencia; Perineal rectosigmoidectomy; Coloanal anastomosis; Continence; Incontinence]

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Rectal prolapse or procidencia denotes a full-thickness prolapse of the rectum through the anal sphincters. The patient with prolapse is often elderly and debilitated with multiple coexistent medical problems. Varying degrees of fecal incontinence may accompany the prolapse. The protruding segment of rectum may not only ulcerate and bleed, but may become incarcerated or even strangulate. To improve continence and to avoid these potential complications, surgical correction, even in frail patients, should be considered.

Over 100 operations have been devised for the treatment of rectal prolapse.¹ These include trans-abdominal resection, suspension, or both, transperineal excision, and encirclement procedures. This plethora of surgical options is testimony to the lack of clear superiority of any one approach. Each option has potential advantages and disadvantages, and recurrence rates vary from 0 to 60 percent depending upon the procedure and length of follow-up.^{2, 3} Perineal excisional procedures include the DeLorme mucosectomy with muscular plication⁴ and the Altemeier perineal rectosigmoidectomy with coloanal anastomosis.⁵ The latter procedure has been championed by Vasilevsky and Goldberg³ and has been modified by Prasad and coworkers.⁶ These authors and others have suggested that the perineal rectosigmoidectomy is a viable surgical alternative for the treatment of rectal prolapse.^{7, 8} The aims of this study were to prospectively assess the morbidity, mortality, and recurrence rates associated with perineal rectosigmoidectomy when performed in the elderly and to assess any correlation between preoperative pudendal nerve function and postoperative incontinence.

MATERIALS AND METHODS

All elderly patients with overt rectal prolapse underwent an elective perineal rectosigmoidectomy with coloanal anastomosis. Overt rectal prolapse was defined as full-thickness protrusion of the rectal wall through the anal orifice. All patients were prospectively evaluated by in-depth functional assessment. This functional assessment was done by a nurse, who assisted the patient in completing a detailed questionnaire that documented bowel function with specific emphasis on continence. Review of the questionnaire permitted objective, unbiased assignment of a continence score to each patient. The score, ranging from 0 to 24, was based on continence to gas, liquid, and solid stool, the frequency of any accidents, and any im-

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pairment of daily activities caused by the incontinence. The continence schema is shown in Table 1 and was adapted and modified from earlier continence grading systems.⁹⁻¹³ The questionnaire was completed preoperatively and again a minimum of six months after surgery. In addition to the questionnaire, patients also underwent preoperative pudendal nerve terminal motor latency (PNTML) testing. The technique of PNTML testing has been described in detail elsewhere.^{14, 15} Both intraoperative and postoperative data registries were maintained by the nurse clinician and the residents. The registry included data regarding major morbidity, mortality, and length of hospitalization. In addition, records were maintained to document the amount and type of prolapse, including recurrent full-thickness or mucosal prolapse as well as postoperative bowel function and continence.

TECHNIQUE

All patients were admitted one day prior to surgery for mechanical and antibiotic bowel preparation and for perioperative parenteral broad-spectrum antibiotics [metronidazole and cefotaxime (Hoechst-Roussel Pharmaceuticals, Inc., Somerville, NJ)]. After intubation or administration of spinal anesthesia, the patient was placed on a hip roll in the prone jackknife position. A bladder catheter was inserted prior to surgery and left in place for two to three days postoperatively. Local anesthesia supplementation was used in all cases. This consisted of a mixture of 0.5 percent Xylocaine® (Astra Pharmaceutical Products, Inc., Westboro, MA), 0.25 percent bupivacaine, and 1:400,000 units of epinephrine. A perianal field block, sub-

mucosal infiltration, and a bilateral pudendal nerve block were all utilized. The prolapse was delivered by gently grasping the distal-most portion of the apex with Babcock clamps. Using electrocautery, a circumferential incision was made 1.5 cm proximal to the dentate line extending through the submucosa. A submucosal dissection was then undertaken to the cephalad limit of the internal anal sphincter. At that point, a full-thickness excision of the rectum and, if possible, sigmoid colon was performed. This full-thickness incision exposed the mesorectum, which was sequentially divided and ligated until the mesosigmoid was reached or until no additional rectum could be transanally delivered. If the sigmoid could be prolapsed, its mesentery was also clamped, divided, and ligated with #2-0 polyglactin ligatures (Ethicon, Inc., Somerville, NJ). When no additional bowel could be delivered without tension, the bowel was marked for transection. Next, if the levator ani muscles were not severely attenuated, they were approximated posteriorly with interrupted 2-0 Prolene® (Ethicon) sutures. When possible, one or two sutures were also used to approximate the levators anteriorly, thus reinforcing the pelvic floor and correcting the abnormal diastasis of the levator ani muscles, thereby narrowing the defect in the pelvic diaphragm. After levatorplasty, the bowel was transected and the anastomosis performed using interrupted 2-0 polyglactin mattress-type sutures. Lastly, the everted anastomosis was reduced. The entire technique has been described in greater detail elsewhere.¹⁶ Following surgery, patients were immediately advanced to a regular diet; parenteral antibiotics were continued for 24 hours.

RESULTS

Between April 1989 and October 1991, 20 patients—16 females and 4 males—with a mean age of 82 (range, 68-101) years and with rectal prolapse were treated in the manner described above. The specific patient demographics and results of treatment are listed in Table 2. Three patients had undergone previous surgery for rectal prolapse; none of these prior operations had been performed at Cleveland Clinic Florida. Prior attempted repairs included a Ripstein repair, a Thiersch wire encirclement, and a perineal rectosigmoidectomy.

The length of rectosigmoid resected at the time of perineal rectosigmoidectomy was a mean of 23 (range, 7-40) cm. The postoperative length of hos-

Table 1.
Continence Scoring System

| | Flatus | Liquids | Solids | Social Limitations |
|-----------|--------|---------|--------|-----------------------|
| Never | 0 | 0 | 0 | 0 |
| Rarely | 1 | 4 | 7 | 2 |
| Sometimes | 2 | 5 | 8 | 4 |
| Always | 3 | 6 | 9 | 6 |

Total maximal score: 24.

0 = perfect continence; 1-9 = good continence; 10-18 = moderate continence; 19-23 = severe incontinence; 24 = total incontinence.

Continence score is determined by adding points from the above grid, which takes into account the type and frequency of incontinence and the extent to which it impacts the patient's life socially.

Table 2.
Demographics and Results

| Patient No. | Age (yr) | Follow-up (months) | PNTML | | Continence Score | |
|-------------|----------|--------------------|-------|-------|------------------|-----------------|
| | | | Left | Right | Preoperatively | Postoperatively |
| 1 | 78 | 35 | | | 21 | 17 |
| 2 | 82 | 27 | | | 19 | 4 |
| 3 | 86 | 24 | | | 22 | 19 |
| 4 | 87 | 24 | | | 17 | 0 |
| 5 | 83 | 20 | | | 18 | 18 |
| 6 | 82 | — | 2.6 | 2.7 | 8 | — |
| 7 | 101 | 23 | 2.0 | 2.0 | 0 | 9 |
| 8 | 87 | 33 | | | 21 | 21 |
| 9 | 91 | 14 | | | 9 | 0 |
| 10 | 83 | 20 | 3.1 | 2.2 | 19 | 17 |
| 11 | 72 | 19 | 2.8 | 2.2 | 14 | 4 |
| 12 | 83 | 33 | | | 4 | 4 |
| 13 | 83 | 18 | 2.2 | 1.4 | 19 | 12 |
| 14 | 76 | 36 | 3.4 | 2.7 | 17 | 7 |
| 15 | 81 | 22 | 2.2 | 1.5 | 24 | 0 |
| 16 | 78 | 35 | 2.0 | 2.0 | 0 | 0 |
| 17 | 79 | 23 | 3.2 | | 21 | 12 |
| 18 | 85 | 35 | 3.9 | | 4 | 0 |
| 19 | 74 | 19 | | | 19 | 16 |
| 20 | 69 | 6 | | | 14 | 0 |
| Mean | 82 | | | | 14.5 | 8.4 |

pitalization ranged from four to eight days, with a mean of 6.4 days. This calculation was performed after exclusion of one patient in whom a significant complication required a 30-day hospitalization. This patient was an 81-year-old female who required perioperative systemic anticoagulation because of a history of a pulmonary embolus. She developed an obstructing pelvic hematoma, which required laparotomy with drainage of the hematoma and temporary fecal diversion. She did have her intestinal continuity re-established during a subsequent hospitalization.

The one death in our series occurred in an 82-year-old patient with significant pulmonary and coronary artery disease. His operation and initial postoperative course were uneventful. On the second postoperative day, he developed both respiratory failure, which required intubation, and recurrent ventricular fibrillation. On the sixth postoperative day, he suffered a lethal cardiac arrest. Thus, the rates of major morbidity, mortality, and reoperation were each 5 percent.

Continence

Preoperatively, six patients had perfect or acceptable continence (continence score of 0–9). Five patients were moderately continent (conti-

nence score of 10–18), and eight patients were severely incontinent (continence scores of 19–24). Postoperatively, there were 11 patients in the fully continent or minimally incontinent group and six patients with moderate incontinence, while two patients remained severely incontinent. These continence results are illustrated in Figure 1. There was no development of postoperative constipation in any patient.

PNTML Studies

Ten of the 20 patients underwent preoperative PNTML studies. Six of these 10 patients had at least unilateral marked prolongation of their latencies (greater than 2.5 milliseconds), while four patients had bilaterally normal latencies. Four of the six patients with markedly prolonged preoperative latencies had poor preoperative continence with a mean continence score of 18. However, three of these four patients with poor preoperative continence and prolonged PNTML regained good to moderate postoperative continence (mean continence score of 3.6), while two patients continued to have moderate incontinence (continence scores of 17 and 12). The four patients with normal preoperative latencies had mean continence scores of 11 preoperatively and 5 postoperatively.

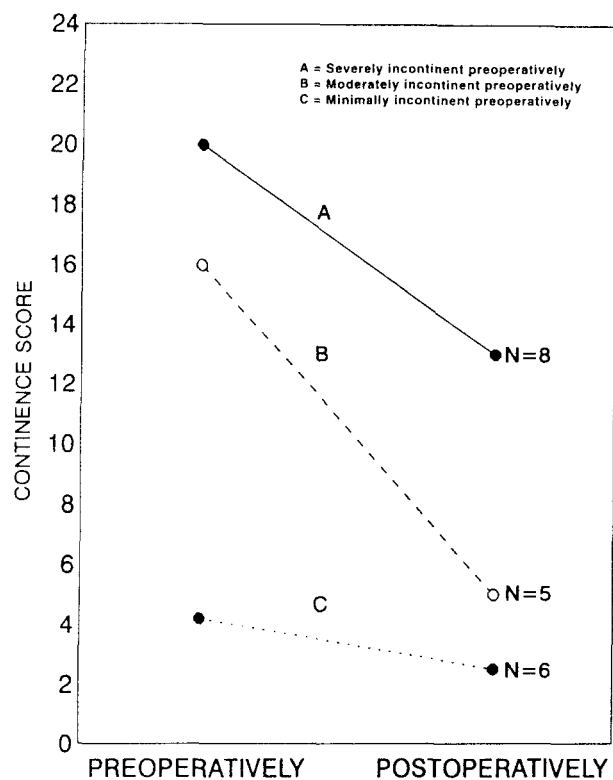


Figure 1. Continence preoperatively and postoperatively. Note the improvements in all three groups.

There were no full-thickness recurrences at a mean follow-up of 26 (range, 6–36) months. Two patients, however, developed mucosal prolapse. In neither case was this mucosal prolapse associated with symptoms, and in both cases the mucosal prolapse occurred only during straining and spontaneously reduced at rest.

Recurrence

At a mean length of follow-up of 26 (range, 6–36) months, there were no full-thickness recurrences. There were, however, two patients who developed asymptomatic, partial-thickness, noncircumferential mucosal prolapse. Owing to the absence of any associated symptoms, neither patient requested or required mucosal prolapse repair.

DISCUSSION

The ideal operation for rectal prolapse should be minimally invasive, have no mortality or morbidity, improve continence, and be associated with no recurrences. Perineal rectosigmoidectomy yields results that approximate these ideals. The present study included 20 elderly patients with full-thickness rectal prolapse. Despite the very elderly

patient population (mean age of 82 years, ranging as high as 101), the procedure was accomplished with relatively low morbidity (5 percent) and mortality (5 percent). The recurrence rate was 0, which compares favorably with the rate reported by other authors.^{5-9, 17-20} Ramanujam and Venkatesh¹⁹ and others²⁰ reported a 5 percent recurrence rate after perineal rectosigmoidectomy. The latter authors, however, added both levator repair and transperineal sutured rectopexy to the standard resection and anastomosis. Restoration of continence was excellent in all of these series, ranging from 78 percent to 100 percent. Williams²¹ reviewed the results of perineal rectosigmoidectomy in 104 patients. Despite a median age of 78 years, there were no postoperative deaths, a 12 percent complication rate, and a 10 percent recurrence rate. Moreover, 67 patients were incontinent to liquid or solid stool before surgery. Fifty-six of these patients had perineal rectosigmoidectomy alone, and 26 of these (46 percent) regained full continence. The remaining 11 patients underwent concomitant levatoroplasty, and 10 of these patients (91 percent) improved, seven of whom became fully continent. The mucosal prolapse rate of 10 percent is similar to that reported by others; recurrence, mortality, and morbidity rates of other studies are summarized in Table 3.

The perineal approach to repair of rectal prolapse offers several advantages over alternative procedures. Although general anesthesia was used for most patients in this series, this procedure can also be accomplished with either spinal or continuous epidural anesthesia. Patients are generally ambulatory, tolerating a regular diet, and comfortable within 24 hours after surgery. One of the frequently cited major drawbacks to perineal rectosigmoidectomy has been recurrence in up to 60 percent of patients.² The incidence of recurrence is clearly related to the length of follow-up; there were no recurrences in the present series despite a mean follow-up of 26 months. There were, however, two minor asymptomatic mucosal prolapses. The incidence of prolapse may be influenced by the amount of bowel excised. Therefore, it is imperative to resect all redundant bowel prior to anastomosis.

One of the major problems associated with rectal prolapse is fecal incontinence. Most series report a preoperative incidence of fecal incontinence in the range of 80 percent,²² which is similar to that

Table 3.
Results of Perineal Rectosigmoidectomy Follow-Up

| Authors | Year | n | Mean Age (yr) | Months | Recurrence | Mortality (%) | Morbidity (%) |
|--|------|-----|---------------|--------|------------|---------------|---------------|
| Theuerkauf <i>et al.</i> ¹⁷ | 1970 | 13 | 54 | — | 38 | 0 | 8 |
| Altemeier <i>et al.</i> ⁵ | 1971 | 106 | 64 | — | 3 | 0 | 24 |
| Porter ¹⁸ | 1971 | 110 | — | — | 58 | 0 | — |
| Friedman <i>et al.</i> ⁷ | 1983 | 27 | 61 | — | 50 | 0 | 12 |
| Gopal <i>et al.</i> ⁸ | 1984 | 18 | 76 | 12 | 6 | 6 | 17 |
| Vasilevsky and Goldberg ³ | 1987 | 66 | — | 31 | 0 | 0 | 15 |
| Ramanujam and Venkatesh ¹⁹ | 1987 | 41 | — | 20 | 5 | 0 | 7 |
| Finlay and Atchison ²⁰ | 1991 | 17 | 82 | 24 | 6 | 6 | 18 |
| Williams ²¹ | 1991 | 104 | 78 | — | 10 | 0 | 12 |
| Johansen <i>et al.</i> (present study) | 1992 | 20 | 82 | 26 | 0 | 5 | 5 |

noted in the current series. However, one must be cautious when comparing degrees of incontinence from one series to another because of the rather subjective and ill-defined use of the term "incontinence." Although there is a significant correlation between prolapse and incontinence, the exact etiologic relationship remains obscure. Many authors have theorized that prolonged prolapse mechanically dilates the sphincters, ultimately resulting in diminished resting pressure.²³ Other authors have theorized that both the prolapse and sphincter dysfunction are manifestations of a common neuromuscular deficiency.¹⁰ A frequently quoted theory postulates that the incontinence is secondary to the constant downward displacement of the pelvic floor resulting in a pudendal neuropathy.^{24, 25} Damage to the innervation of the pelvic floor has been demonstrated by biopsies, which have shown evidence of denervation.²⁶ Electromyographic studies have also supported this conclusion, as increased fiber densities have been shown in the puborectalis and external sphincters of incontinent patients when compared with normal controls and also with continent patients with rectal prolapse.^{27, 28} However, the influence of perineal descent upon pudendal nerve function may not be as simple as was originally theorized.²⁹ Jorge and colleagues³⁰ recently prospectively assessed 213 patients with pelvic floor dysfunction with pudendal nerve testing and cinedefecography. They found no correlation between the amount of perineal descent and PNTML even when the latency was greater than 3.1 milliseconds or when the descent was greater than 7 cm. Thus, the hypothesized neuropathy may be more of a sensory than a motor dysfunction.³¹ This supposition is

supported by the fact that, in the current series, four of the six patients who demonstrated markedly prolonged preoperative latencies had poor preoperative continence. However, three of these four patients went on to recover good to moderate postoperative continence. Thus, from this small sample, it was difficult to establish a definitive relationship between functional outcome and preoperative PNTML values.

Although incontinence may persist after perineal rectosigmoidectomy, the development of constipation was not a problem in the current series. This is very different from what has been noted after abdominal surgery for rectal prolapse. Hiltunen and Matikainen³² recently reported a 31 percent incidence of constipation after abdominal rectopexy. The development of postoperative constipation is probably the most common sequela after a fixation rectopexy.³³

CONCLUSION

Perineal rectosigmoidectomy is a relatively safe operation, even in the octogenarian. It has a low recurrence rate and can improve continence to some extent in most patients. Improvements in continence may be expected even in some patients in whom pudendal neuropathy is present. Thus, perineal rectosigmoidectomy is a safe and viable alternative for the treatment of rectal prolapse in the elderly patient.

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