The Management of Procidentia

30 Years' Experience

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This is a retrospective study evaluating 179 patients with complete rectal prolapse operated on at the University of Minnesota affiliated hospitals from 1953 to 1983 with no mortality. One hundred and two of 138 patients who underwent abdominal proctopexy and sigmoid resection were followed from six months to 30 years with a recurrence rate of 1.9 percent. Twenty-two of the 33 patients who underwent perineal rectosigmoidectomy were followed from six months to three years with no recurrence. Nine patients who underwent abdominal proctopexy and subtotal colectomy because of colonic inertia associated with procidentia were followed from one to six years with no recurrence. Patient interviews revealed that 72 to 80 percent considered their results as excellent or good. Incontinence or persistent constipation caused the remaining patients to consider their results fair or poor, despite anatomic correction of the prolapse. Abdominal proctopexy and sigmoid resection was more likely to result in improvement of continence than was perineal rectosigmoidectomy. [Key words: Procidentia; Complete rectal prolapse; Abdominal proctopexy and sigmoid resection; Perineal rectosigmoidectomy]

PROCIDENTIA is an uncommon and disabling surgical problem that continues to evoke considerable controversy regarding its management. Both patient and physician frequently remain dissatisfied because of persistent incontinence, bowel management problems or recurrence. Few studies adequately address the problem of incontinence, yet this remains the primary cause of persistent patient disability and dissatisfaction following anatomic correction of prolapse.

The vast majority of patients with procidentia can be managed by two procedures. The good risk patient is best managed by abdominal proctopexy without foreign material. The elderly or poor-risk patient is better managed by perineal rectosigmoidectomy and generally tolerates this so well that there is only a limited place for the anal encirclement procedures. There is a small subgroup of patients with colonic inertia associated with procidentia who are best managed by abdominal proctopexy and subtotal colectomy, but they must be fully continent.

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Methods and Materials

Study Group: From 1953 to 1983, at the University of Minnesota affiliated hospitals, 179 patients underwent 181 procedures for the correction of complete rectal prolapse. One hundred twenty-two females and 16 males, ranging in age from 8 to 84 years (average, 52 years) underwent abdominal proctopexy and sigmoid resection. Thirty-three females ranging in age from 51 to 93 years (average, 78 years) were managed by perineal rectosigmoidectomy. Nine female patients ranging in age from 30 to 75 years (average, 54 years) underwent abdominal proctopexy and subtotal colectomy for correction of prolapse associated with colonic inertia. Two patients had recurrences after abdominal proctopexy and sigmoid resection. One was managed by a perineal rectosigmoidectomy and the other by low anterior resection.

Hospital and office records were utilized to determine mortality and morbidity associated with these procedures. Patients were assessed for recurrence only if they had been followed and examined in our own offices for a minimum of six months. Patient satisfaction with the procedure and assessment of continence was determined only in those patients contacted for personal interview by one of the authors.

Occurrence: Our patient population consisted of 163 women and 16 men for a ratio of 10:1. The women in this study ranged in age from 17 to 93 years (average, 60 years). The men ranged in age from 8 to 54 years (average, 31 years). We found prolapse to be rare in women under 20 and in men over 45. The incidence in women increased gradually from the second decade, peaking in the seventh

decade. In males, procidentia is evenly distributed throughout their age range and is uncommon beyond the fourth decade (Fig. 1).

Symptoms and Findings: All of our patients were aware of the prolapse. Almost two-thirds of the patients complained of constipation. Approximately 40 percent complained of varying degrees of incontinence and 21 percent complained of tenesmus. Bleeding, pain, pruritus, and obstipation were infrequent symptoms. Examination of these patients occasionally demonstrated no evidence of prolapse unless the patient was asked to bear down. Proctosigmoidoscopy occasionally revealed nonspecific inflammation or ulceration on the anterior rectal wall consistent with solitary rectal ulcer syndrome. We emphasize the fact that one must consider the diagnosis of prolapse in those patients who present with so-called "idiopathic" incontinence and/or proctoscopic findings suggestive of nonspecific "proctitis" or "solitary ulcer."

Surgical Procedures: Abdominal proctopexy and sigmoid resection is performed through a transverse lower abdominal incision. The left colon is mobilized from the mid-descending level to the sacral promontory where the presacral space is entered and posterior mobilization of the rectum is carried out to the level of the levator ani muscle. In the pelvis, the peritoneum is incised 1 cm lateral to either side of the rectum and dissection is carried distally with preservation of the lateral rectal stalks. The rectum is elevated and its lateral peritoneal attachments sutured to the presacral fascia beginning just below the sacral promontory. Generally, two sutures of 2-0 silk on either side of the rectum are all that are necessary. A segmental resection is performed, eliminating redundancy in the left colon, and the anastomosis is performed at a convenient level without tension. No

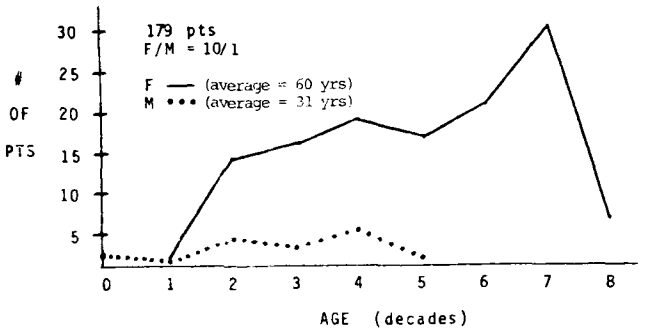

FIG. 1. Occurrence of prolapse.

attempt is made to obliterate the deep cul-de-sac or to repair the levator hiatus (Fig. 2).

Perineal rectosigmoidectomy can be performed in either the prone jackknife or dorsal lithotomy position. It requires that the rectum can be prolapsed a minimum of 5 cm through the anal verge. Two to three centimeters proximal to the dentate line, the mucosa and submucosa are infiltrated with a solution containing 1:200,000 units of epinephrine. A circumferential, full-thickness incision is made completely incising the outer cylinder of bowel. The rectosigmoid is mobilized by taking down its posterior and lateral mesenteric attachments. This procedure is continued until the redundant bowel cannot be pulled down any farther. Approximately 2 cm distal to the anus, the inner cylinder of bowel is transsected. Thus, a redundant segment of 6 to 25 cm of rectosigmoid is resected and the anastomosis is performed 1 to 2 cm above the dentate line either with interrupted sutures or with an intraluminal stapling device.[1] When stapling devices are used, the bowel should be transsected 1 cm longer to allow for placement of the purse-string suture. Of the 33 amputative rectosigmoidectomies performed, 16 employed

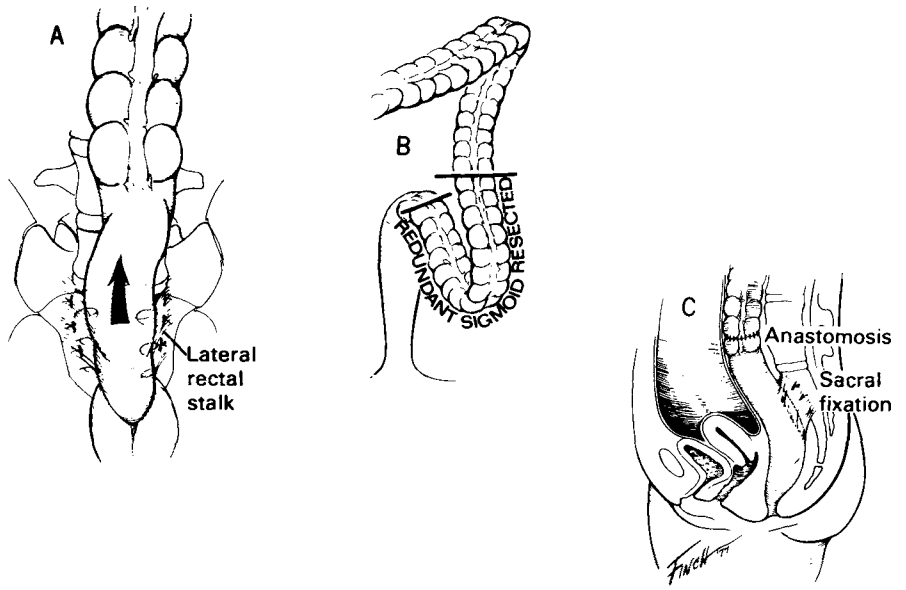

FIG. 2. Abdominoproctopexy and sigmoid resection.

a technique for anastomosis utilizing an intraluminal stapling device. We do not repair the levator ani or puborectalis muscles (Figs. 3 and 4).

Results

Patient Satisfaction and Recurrences: Thirty-six of the 138 patients who underwent abdominal proctopexy and sigmoid resection were lost to follow-up, leaving 102 patients for evaluation. Of this group, 81 percent were followed for two or more years, 70 percent for three or more years, and 57 percent for four or more years, with follow-up ranging from six months to 30 years. There were no operative deaths, and the average hospital stay was ten days. Two patients (1.9 percent) developed recurrences, one six months and the other two and one-half years postoperatively. One was managed by perineal rectosigmoidectomy and the other by low anterior resection, without subsequent recurrence. Sixty-one of the 102 patients were still available for interview. Seventy-two percent considered their results to be excellent, 8 percent good, 5 percent fair, and 15 percent poor. The 20 percent that considered their results fair or poor did so because of incontinence or severe constipation.

Eleven of the 33 female patients managed by perineal rectosigmoidectomy were lost to follow-up. Of the remaining 22 patients, follow-up ranged from six months to three years with an average of 1.9 years. This procedure is reserved for the elderly or debilitated patient, so follow-up is shorter. There were no operative deaths or recurrences. Eighteen of the 22 patients were contacted for interview. Sixty-seven percent considered their results to be excellent, 5 percent good, 17 percent fair, and 11 percent poor. The 28 percent considering their results fair or poor did so because of incontinence.

The nine female patients who underwent abdominal proctopexy and subtotal colectomy for correction of prolapse associated with colonic inertia were followed from one to six years with an average of two years. All were contacted for interview. Seven patients (78 percent) felt their results were excellent to good, while two patients (22 percent) felt results were poor because of incontinence.

Incontinence: Anal incontinence was graded A to D as follows: A = perfect; B = occasional incontinence of gas and mucus; C = frequent incontinence of gas, mucus, and liquid; and D = total incontinence. Categories A and B would generally be considered acceptable degrees of continence, while C and D are unacceptable and require frequent or constant wearing of a protective pad.

Forty percent of the 61 patients interviewed recalled varying degrees of incontinence prior to proctopexy and sigmoid resection, with 24 percent reporting major or total incontinence (Tables 1 and 2). Following surgery, 77 percent of the 61 patients had perfect continence, 8 percent minor incontinence, and only 15 percent unacceptable incontinence.

Surprisingly, only 23 percent of the 18 patients interviewed following perineal rectosigmoidectomy recalled varying degrees of incontinence prior to surgery (see Tables 2 and 3). After surgery, 11 percent reported minor incontinence and 28 percent unacceptable levels of incontinence.

Discussion

Even today some disagreement remains as to whether rectal prolapse represents a sliding hernia, an intussusception, or a combination of the two. In 1912, Alexis Moschowitz[2] described rectal prolapse as a sliding hernia and attempted to establish sound anatomic principles for its management. Following the principles of herniorrhapy, he felt that repair of the levator hiatus and obliteration of the deep cul-de-sac were essential. However, recurrence rates in the range of 48 percent cast doubt on his theories and relegated this procedure to a position of historic interest only.[3]

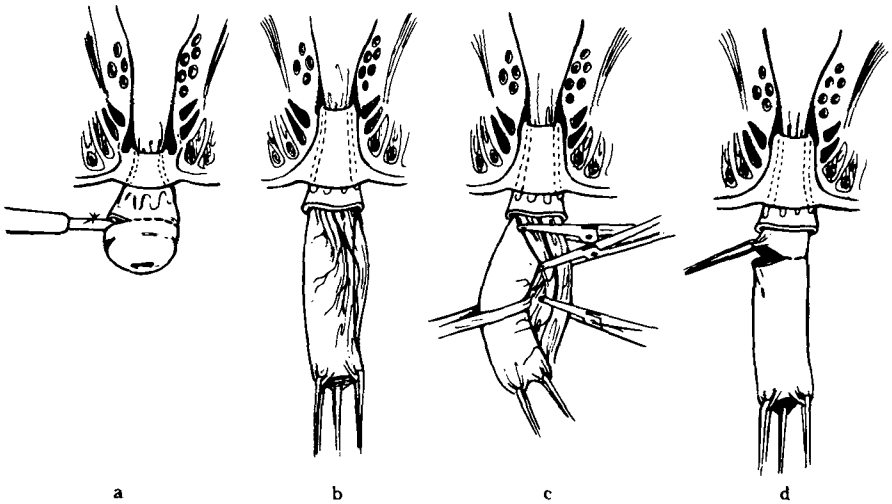

FIG. 3. a = beginning of incision 2-3 cm from dentate line; b = unfolding of prolapsing segment; c = division of mesentery; d = division of inner tube of intestine. (By permission of Surgery, Gynecology and Obstetrics.)

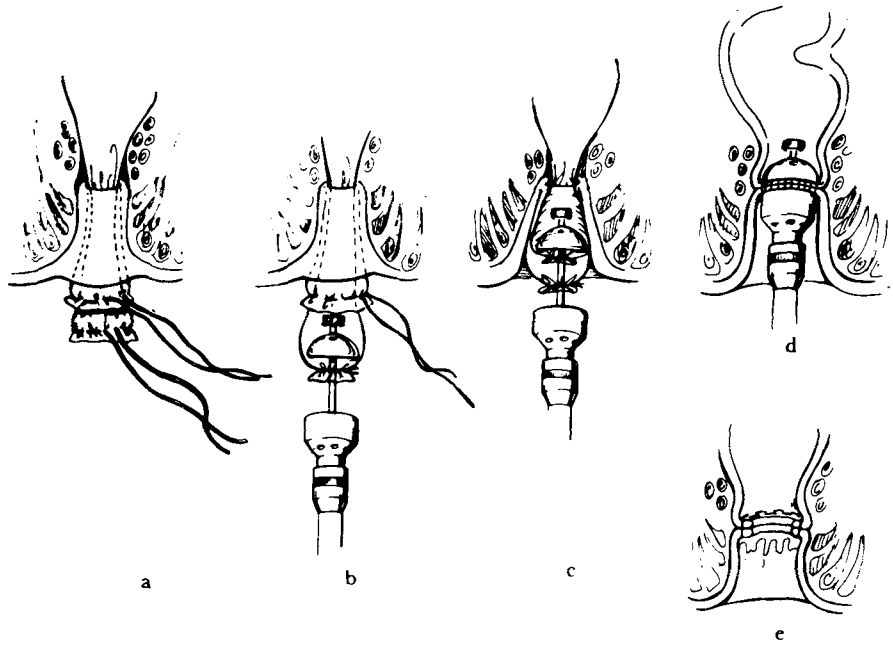

FIG. 4. a = placement of purse-string sutures; b = proximal purse-string suture secured around anvil; c = distal purse-string suture secured; d = closure of instrument, ready for firing; e = completed anastomosis. (By permission of Surgery, Gynecology and Obstetrics.)

Cineradiographic studies by Broden and Snellman,[3] later confirmed by Theuerkauf *et al.*[4] demonstrated that rectal prolapse is not a sliding hernia but rather an intussusception of low and mid-rectum. The anatomic abnormalities common to patients with rectal prolapse, *i.e.*, 1) abnormally deep cul-de-sac, 2) diastasis of the levators, 3) loss of horizontal position of the rectum with loss of its sacral attachments, 4) redundant rectosigmoid, and 5) patulous anus are results of the prolapse rather than its cause. As a better understanding of prolapse has evolved, so has its management, which entails prevention of intussusception by fixation, resection, or a combination of the two. It has not been shown that repair of the levator hiatus or the deep cul-de-sac is necessary.

The transabdominal suspension-fixation and resectional procedures yield the best results, but are limited to patients who are good surgical risks. Those procedures combining suspension-fixation with resection are associated with recurrence rates of 0 to 3.6 percent,[3,5-7] while those without resection vary from to 0 to 18.9 percent.[3,8-19]

Perineal procedures such as perineal rectosigmoidectomy, the Altemeier procedure or the Delorme procedure are tolerated well by the elderly, poor-risk patient, but are associated with recurrence rates varying from 2.8 to more than 60 percent. We are unable to explain this discrepancy.[3,20-23] Hughes[21] reported a recurrence rate of over 60 percent in 150 patients undergoing perineal rectosigmoidectomy with more than half being incontinent. Subsequently, Porter[22] published a series of 110 patients, many of whom underwent perineal suture of the levators as part of the procedure, with recurrence developing in 58 percent. The lack of recurrence in our series is probably a manifestation of the shorter follow-up in these elderly, debilitated patients who may not survive long enough for a recurrence to develop. The Delorme procedure may be an attractive alternative to perineal rectosigmoidectomy since Uhlig and Sullivan[24] have reported good functional results and a recurrence rate of only 6.8 percent in 44 patients followed two to ten years. Most surgeons, however, are unfamiliar with the techniques involved.

Procedures that narrow the anal orifice, such as the Thiersch anal encirclement procedure or its modifica-

TABLE 1. *Continence: Abdominal Proctopexy and Sigmoid Resection in 61 Patients*

	Grade of Continence	Preoperative		Postoperative	
		Patients	Percent	Patients	Percent
Acceptable	A (Perfect)	36	(59)	47	(77)
	B (Minor incontinence)	10	(16)	5	(8)
Unacceptable	C (Major incontinence)	5	(8)	5	(8)
	D (Total incontinence)	10	(16)	4	(7)
TOTAL		61		61	

TABLE 2. *Postoperative Continence*

Abdominal Proctopexy and Sigmoid Resection		Perineal Rectosigmoidectomy
Patients		Patients
42	Same	13
18	Improved	1
1	Worse	4
TOTAL 61		18

TABLE 3. *Continence: Perineal Rectosigmoidectomy in 18 Patients*

	Grade of Continence	Preoperative Patients	Preoperative Percent	Postoperative Patients	Postoperative Percent
Acceptable	A (Perfect)	14	(78)	11	(61)
	B (Minor incontinence)	2	(11)	2	(11)
Unacceptable	C (Major incontinence)	1	(6)	4	(22)
	D (Total incontinence)	1	(6)	1	(6)
TOTAL		18		18	

tions, continue to be associated with a high incidence of complications, do nothing for the underlying problem, and have a limited place in the current management of procidentia. In many poor-risk patients, who would have otherwise undergone an anal encirclement procedure, we have had gratifying results with perineal rectosigmoidectomy.

The Ripstein procedure utilizes a sling of Teflon® or Marlex® mesh to attach the rectum to the sacrum. The Wells procedure utilizes a sheet of Ivalon® sponge fixed to the sacrum and partially wrapped about the rectum. This modification leaves an anterior segment of bowel free, thereby eliminating the problems of stenosis, fecal impaction, and sling obstruction occasionally encountered following the Ripstein procedure. These procedures have similar recurrence rates varying from 0 to 12 percent.[8-19] Gordon and Hoexter,[25] polling members of the American Society of Colon and Rectal Surgeons, found that, following the Ripstein procedure, complications related to placement of the sling occurred in 16.5 percent of patients. Significant bowel management problems ranging from episodic abdominal pain to fecal impaction to sling obstruction are more frequent following the Ripstein procedure and are reported as 6.7 to 32.7 percent.[8,9,25] To many, this has represented a major drawback to the Ripstein procedure and is felt to be directly related to the anterior sling.

Those concerned about utilizing foreign material generally accomplish suspension-fixation by means of suture, fascial grafts or omental pedicles.[7,26-32] Abdominal proctopexy without foreign material has yielded recurrence rates of 0 to 12 percent.[27,31,32] Carter's 3 percent rate[27] in a recent series of 32 patients treated by suture proctopexy is attractive and bears consideration for those patients in whom sigmoid redundancy is not prominent.

Some favor routine resection, either sigmoid resection combined with proctopexy or low anterior resection. In the presence of foreign material, resection is relatively contraindicated due to the risk and severe consequences of infection. Where redundancy in the left colon is not significant, resection may not be necessary. However, leaving significant redundancy may explain the increased incidence of bowel management problems associated with sling suspension procedures. Our preferred procedure for the good-risk patient is abdominal proctopexy and sigmoid resection. Following this procedure, we experienced a 4 percent incidence of complications directly related to the anastomosis; half of the patients required reoperation. Though a segmental sigmoid resection has added to the magnitude of our procedure, its benefits are significant. Frykman and Goldberg,[26] the originators of this approach, felt that "of all the weaknesses or abnormalities required to produce rectal prolapse, the only factor that can be controlled with certainty is the length of the colon." Resection will prevent an early recurrence, while the mobilized rectum is becoming firmly adherent to the sacrum by means of fibrous scar tissue. Furthermore, segmental resection is ideally suited for those patients with significant sigmoid diverticular disease. Resection combined with an anatomic correction of the prolapse is beneficial for improving postoperative bowel habits. Sixty-three percent of our patients complained of preoperative constipation. After abdominal proctopexy and sigmoid resection, 56 percent experienced improvement in bowel habits, 35 percent remained unchanged, and 9 percent had progressively increasing problems.

We are now attempting to identify the subgroup of patients with severe colonic inertia by means of preoperative motility and transit time studies. Once identified, they are further studied by anal manometry. Those who have normal sphincter pressures and proven colonic inertia associated with procidentia are being managed by abdominal proctopexy and subtotal colectomy. In order to be a candidate for subtotal colectomy, the patient must be perfectly continent; those who were not had unsatisfactory results.

An accurate appraisal of recurrence is shown by our data, indicating a 1.9 percent recurrence rate following abdominal proctopexy and sigmoid resection with an 80 percent two-year or longer and a 70 percent three-year or longer follow-up. Review of the literature would confirm that the majority of recurrences, regardless of type of repair, will present within two to three years.[3,10,11,14,19,29]

Published series indicate the incidence of incontinence associated with procidentia varies from 26 to 81 percent. Approximately 50 percent of those patients who are incontinent will improve following a transabdominal repair of the prolapse, but this may require six to 12 months (Table 4). Persistent incontinence, despite anatomic correction of prolapse, represents the major cause of postoperative patient disability and dissatisfaction. Few studies have addressed the problem of incontinence in any depth. For some time it was believed that, with procidentia, mechanical stretching of the sphincter caused

TABLE 4. *Procidentia: Abdominal Repairs/Incontinence*

Author	Procedure	Patients	Percent Incontinence		Percent Improved
			Preoperative	Postoperative	
Morgan *et al.*[14]	Wells	103	81	39	52
Keighley *et al.*[12]	Wells	100	67	24	64
Holmstrom *et al.*[11]	Ripstein	59	54	22	59
Christiansen and Kirkegaard[30]	Orr-Loygue	24	46	25	46
Authors	Frykman-Goldberg	61	40	23	43

incontinence. However, Parks, *et al.*[33] pointed out that all patients with incontinence, either idiopathic or associated with prolapse, demonstrated abnormal perineal descent on straining. Electromyographic and biopsy studies confirmed Parks' theory that incontinence was the result of this abnormal perineal descent, which led to a traction injury of the pudendal nerves, resulting in denervation of the pelvic floor musculature and the sphincter.[33-35] This may explain the occasional persistence of incontinence, despite anatomic correction of procidentia.

Rather consistent results are reported following transabdominal procedures for correction of procidentia with incontinence improving in 43 to 64 percent (Table 4). Equally consistent is the fact that, following perineal rectosigmoidectomy, incontinence improves only 6 to 20 percent of the time and, in this respect, the functional results of transabdominal procedures are again superior to perineal rectosigmoidectomy (Table 5). The literature is rather sparse, and little data are available to answer the question of whether removal of a segment of distal anorectum may result in diminished continence. In 1949, O'Carroll[36] reported that, following perineal rectosigmoidectomy, patients demonstrated an afferent sensory alteration in their mechanism of continence. This sensory change, combined with a distal resection that reduces the ampullary reservoir, could explain our observation that continence is unlikely to improve and may occasionally diminish following perineal rectosigmoidectomy.

It appears, from the work of Keighley *et al.*,[37,38] that there is no prognostic value to preoperative manometry in predicting which patients will regain acceptable postoperative continence. If, however, the patient remains incontinent six to 12 months postoperatively, it appears that performance of a Parks postanal repair and/or plication sphincteroplasty will result in a significant number of these patients regaining satisfactory continence.

Conclusion

The vast majority of patients with procidentia can be managed by either abdominal proctopexy and sigmoid resection or perineal rectosigmoidectomy. Both procedures involve principles familiar to all abdominal surgeons and avoid the use of foreign material. Perineal rectosigmoidectomy is reserved for the elderly or debilitated patient because of our own concern for high recurrence rates reported by others and the occasional alteration of continence seen in association with this procedure. The Thiersch or modified anal encirclement procedures have a very limited place in the modern management of procidentia since the majority of elderly or debilitated patients can be managed safely and with better results by perineal rectosigmoidectomy. Abdominal proctopexy and subtotal colectomy should be reserved for a select group of prolapse patients with proven colonic inertia, normal continence and normal sphincter manometry. Those patients with unresolved incontinence six to 12 months postoperatively should be considered for a Parks postanal repair and/or plication sphincteroplasty.

TABLE 5. *Procidentia: Perineal Rectosigmoidectomy/Incontinence*

Author	Patients	Percent Incontinence		Percent Change
		Preoperative	Postoperative	
Friedman *et al.*[23]	27	41	33	20 Improved
Theuerkauf *et al.*[4]	10	50	40	20 Improved
Authors	18	23	39	6 Improved 20 Worsened

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Announcement

INTERNATIONAL CONFERENCE: FRONTIERS IN COLORECTAL DISEASE

In honor of the 150th anniversary of St. Mark's Hospital for Diseases of the Rectum and Colon, an international conference will be held at the Barbican Centre for Arts and Conferences, London, England May 29-31, 1985. The main symposia of the conference will deal with functional bowel disorders and neoplastic and inflammatory bowel diseases. There will be Free Paper and Poster sessions (call for abstracts October 1984) and Seminars in Patient Care. An attractive social program will be arranged for all participants including an Anniversary Banquet in Guildhall, one of the finest historical buildings in the City of London. For further information, contact 150th Anniversary Conference, Concorde Services Limited, 10 Wendell Road, London, W12 9RT England.