

47

Rectal Prolapse

Anthony M. Vernava, III and David E. Beck

Prolapse, in general, is defined as: “A falling down of an organ or part . . . from its normal position.” Rectal prolapse is a “falling down” of the rectum so that it is outside the body. Its appearance is that of an erythematous, proboscis-like object and is a true intussusception of the rectum through the sphincters. The condition is embarrassing and can be socially debilitating although it is rarely a medical emergency. It is associated with fecal incontinence, and in women, is associated with other pelvic floor abnormalities. The precise cause of rectal prolapse is unknown although two theories of etiology have been proposed. At the beginning of the nineteenth century, Moschowitz¹ suggested that prolapse is a sliding hernia through a defect in the pelvic fascia. More recently, and with the benefit of cindefecography, Broden and Snellman² proposed that prolapse is actually a circumferential intussusception of the rectum. It is this latter theory that most investigators subscribe to. The majority of patients afflicted with rectal prolapse have a long history of constipation and straining.

The disorder is more common in women, especially in older age groups. Affected men tend to be younger (20–40 years of age) and usually have a predisposing disorder (e.g., congenital anal atresia). Women are at increased risk of developing prolapse by virtue of their anatomy (i.e., wide pelvis) and because of childbearing. Vaginal delivery is known to stretch the pudendal nerves and long-term neurologic damage can occur at this time resulting in perineal descent, prolapse, and incontinence. A vast number of different procedures have been described to manage the disorder serving as testimony to the uncertain etiology of the disease and the resultant disagreement about optimal surgical therapy (Table 47-1).

Patient factors that influence the choice of operation are: age, sex, medical condition, extent of prolapse, bowel function, and status of fecal continence. Procedure-related factors that influence the choice of operation include: extent of procedure, potential morbidity, recurrence rate, impact on fecal continence and bowel habit, familiarity and ease of technique.

Patient Evaluation

Constipation and straining, fecal incontinence, and erratic bowel habits typify the symptoms associated with prolapse. These symptoms are nonspecific and are associated with both mucosal pathology and functional bowel disease therefore, a complete evaluation before operation is necessary.

Spontaneous prolapse is obvious on inspection (Figure 47-1).³ Some patients may require straining to produce the prolapse, and the straining patient is best examined in the squatting or sitting position. The patient can be examined while he or she is on the toilet by having the patient lean forward or using a long rod to which a mirror is attached placed between the patient's legs to view the prolapse. Another option is to place a flexible endoscope into the toilet with the viewing end pointed toward the perineum.

Full-thickness prolapse is distinguished by its concentric rings and grooves as opposed to the radially oriented grooves associated with mucosal prolapse (Figure 47-2). Inspection should also include examining the perianal skin for any maceration or excoriations. A digital rectal examination is important to detect concomitant anal pathology and to assess resting tone and squeeze pressure of the anal sphincters and function of the puborectalis muscle.

Colonoscopy or flexible sigmoidoscopy with barium enema should be performed to rule out associated mucosal abnormalities. Defecography is usually not necessary in the evaluation of full-thickness prolapse but it is an essential part of the evaluation of internal procidentia (rectoanal intussusception). Anal manometry can help assess sphincter function; longstanding prolapse typically damages the internal anal sphincter and may cause poor resting pressures.⁴ In such patients, synchronous levatorplasty should be considered at the time of prolapse repair and may further improve continence.⁵ In a manometric study evaluating patients with rectal prolapse, Spencer⁴ reported that the anorectal inhibitory reflex was frequently absent or abnormal, that resting anal pressures were abnormally low, and squeeze pressures were normal. Anal electromyography and pudendal nerve terminal

TABLE 47-1. Operations described for rectal prolapse

Transabdominal procedures	
1. Repair of the pelvic floor	Abdominal repair of levator diastasis Abdominoperineal levator repair
2. Suspension-fixation	Sigmoidopexy (Pemberton-Stalker) Presacral rectopexy Lateral strip rectopexy (Orr-Loygue) Anterior sling rectopexy (Ripstein) Posterior sling rectopexy (Wells) Puborectal sling (Nigro)
3. Resection procedures	Proctopexy with sigmoid resection Anterior resection
4. Perineal procedures	Perineal rectosigmoidectomy (Altemeier) Rectal mucosal sleeve resection (Delorme) Perineal suspension-fixation (Wyatt) Anal encirclement (Thiersch + modification)

motor latency are generally not clinically helpful unless there is a history of severe straining. In such cases, anal electromyography presence of inappropriate puborectalis contraction. When discovered, biofeedback can be used for therapy. Colonic transit times should be done in patients with a coexisting history of severe constipation so that the correct operation can be chosen. Individuals with slow-transit constipation and site markers concentrated in the left and sigmoid colon typically benefit from a synchronous sigmoid colectomy and rectopexy versus rectopexy alone or even perineal rectosigmoidectomy.

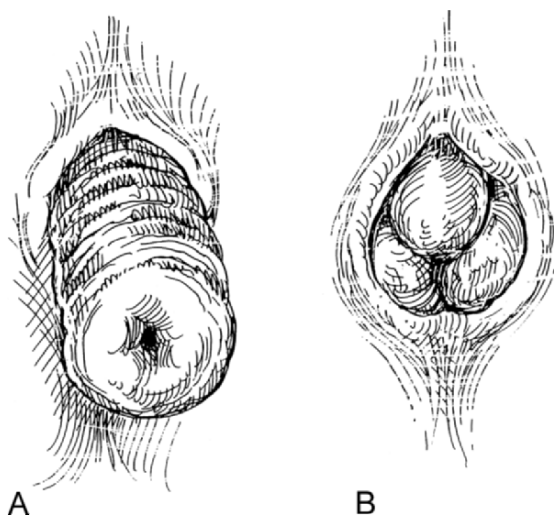


FIGURE 47-1. Mucosal versus full-thickness prolapse. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center). A. circumferential full-thickness prolapse; concentric mucosal folds B. Radial folds seen with hemorrhoidal prolapse.

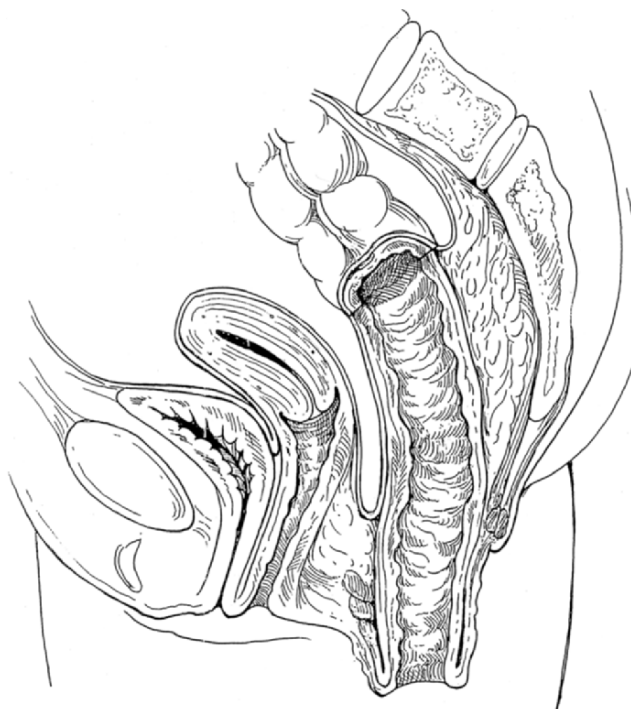


FIGURE 47-2. Sagittal view of full-thickness rectal prolapse. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

Surgical Procedures

The surgeon must decide between a perineal operation and an abdominal procedure. Men are at risk for sexual dysfunction with an abdominal approach, therefore this option is chosen cautiously. The risk of impotence for abdominal rectopexy should approach 1%–2% in skilled hands.

The most common abdominal operations are resection with or without rectopexy or rectopexy alone. The perineal procedures are perineal rectosigmoidectomy (Altemeier) or mucosal sleeve resector (Delorme). Elderly, high-risk patients are best treated by perineal procedures which can be performed under a regional anesthetic, or even a local anesthetic with intravenous sedation. Healthy adults with normal bowel habits may undergo either rectopexy ± sigmoidectomy or perineal rectosigmoidectomy ± levatorplasty. Bowel function has a role in determining specific therapy. Constipated patients should undergo resection and rectopexy. Incontinent patients should undergo either abdominal rectopexy or perineal rectosigmoidectomy + levatorplasty. Recurrent prolapse mandates knowledge of the prior repair because that information will dictate future options; the prior dissection may limit the available alternatives because of blood supply divided.

Perineal Procedures

Perineal Rectosigmoidectomy

Perineal rectosigmoidectomy was popularized by Altemeier and his name is the eponym attached to the procedure.⁶ The operation can be performed under a general or spinal anesthetic or even a local anesthetic with intravenous sedation. Typically, patients receive a mechanical and antibiotic bowel preparation. The prone position is preferred; however, the left lateral (Sim's) or lithotomy position can also be effectively used. The rectal wall is injected with an epinephrine containing compound for hemostasis. A circumferential incision is made in the rectal wall approximately 1–2 cm above the dentate line (Figure 47-3). The incision is deepened until the full thickness of the rectal wall has been divided. Once a full-

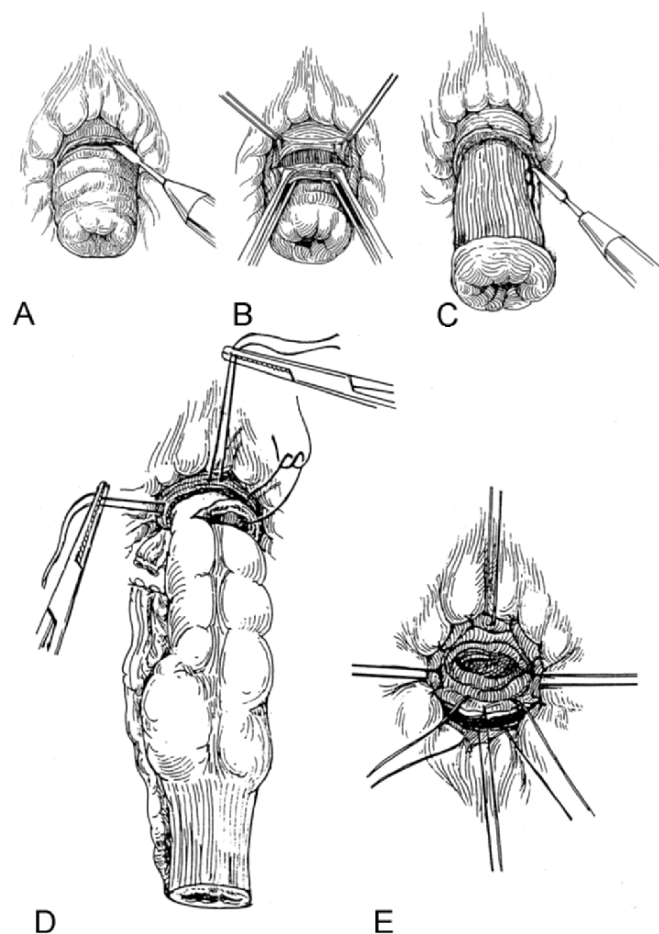


FIGURE 47-3. Perineal rectosigmoidectomy. **A, B** Incision of rectal wall. **C** Division of vessel adjacent to bowel wall. **D** The prolapsed segment is amputated. Stay sutures previously placed in distal edge of outer cylinder are placed in cut edge of inner cylinder. **E** Anastomosis of distal aspect of remaining colon to the short rectal stump. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

thickness incision has been made, the cut edge of the rectum is pulled down and the mesorectum is divided and ligated, progressively advancing more cephalad. Anteriorly, a peritoneal reflection (hernia sac) is encountered. The dissection continues until there is no further redundancy remaining in the rectum/sigmoid colon, this requires judgment and experience. After the redundant rectum has been adequately mobilized, it is divided and a hand-sutured coloanal anastomosis is performed. An EEA stapler can also be used to perform the anastomosis. In cases of severe fecal incontinence, a levator plication can be performed before the coloanal anastomosis improves continence in two-thirds of patients.^{5,7} After the procedure, patients are allowed to ambulate and eat on postoperative day 1.

Reported results of the perineal rectosigmoidectomy are summarized in Table 47-2. Mortality has been low and morbidity ranges from 5% to 24%. Most morbidity is from the preexisting medical problems; however, most series report anastomotic complications in a small number of patients. Recurrence rates range from 0% to 10% in series with a follow-up of 6 months to 5 years. Recurrence rates are higher for series with longer follow-up. Improvement in incontinence has been reported in the majority of patients in whom levatorplasty is performed.¹⁶

Delorme Procedure

Another perineal option is mucosal proctectomy first discussed by Delorme in 1900.¹⁷ It is ideally suited to those patients with full-thickness prolapse limited to partial circumference (e.g., anterior wall) or less-extensive prolapse.

The Delorme's procedure for treating rectal prolapse differs from the perineal rectosigmoidectomy (Altemeier) in that only the mucosa and submucosa are excised from the prolapsed segment (Figure 47-4). Delorme's procedure can be performed under general, spinal, or local anesthesia. The bowel is prolapsed and the submucosa infiltrated with epinephrine solution. One centimeter cranial (proximal) to the dentate line, the outer cylinder is incised through the mucosa only. The mucosa and submucosa are dissected off the

TABLE 47-2. Results of perineal rectosigmoidectomy

Authors	No. of patients	Recurrence (%)	Mortality (%)	Morbidity (%)
Altemeier et al. ⁶	106	3	00	24
Friedman et al. ⁸	027	50	00	12
Gopal et al. ⁹	18	6	06	17
Finlay and Aitchison ¹⁰	17	6	06	18
Williams et al. ¹¹	114	11	00	12
Johansen et al. ¹²	20	0	05	05
Kim et al. ¹³	183	16	00	14
Azimuddin et al. ¹⁴	36	16	—	—
Zbar et al. ¹⁵	80	4	—	—

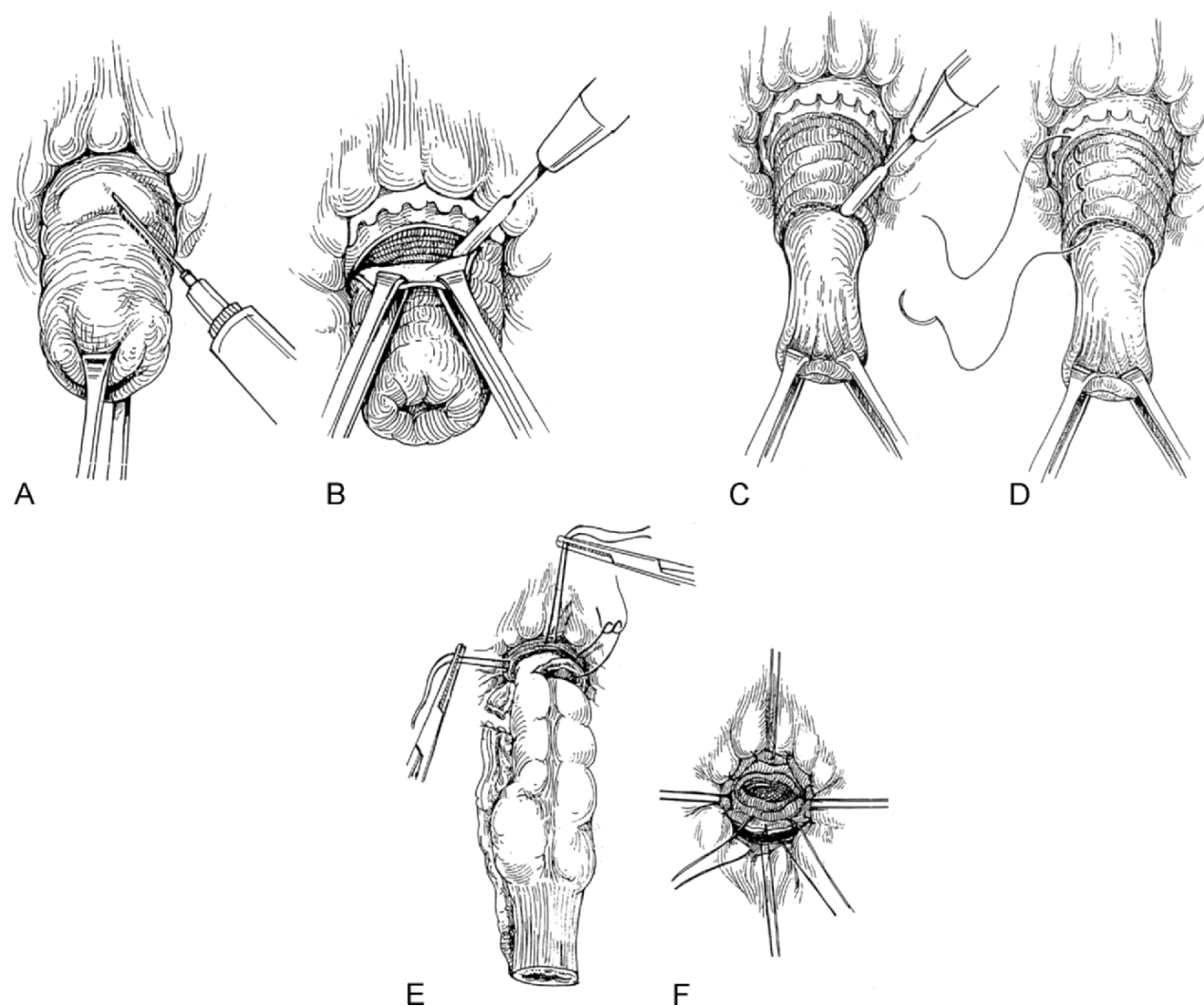


FIGURE 47-4. Delorme's procedure. **A** Subcutaneous infiltration of dilute epinephrine solution. **B** Circumferential mucosal incision. **C** Dissection of mucosa off muscular layer. **D** Plicating stitch approximating cut edge of mucosa, muscular wall, and mucosa just proximal to dentate line. **E** Plicating stitch tied. **F** Completed anastomosis. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

underlying muscle. The mucosectomy may be more difficult in patients with prior anal surgery or a history of diverticulitis. The plane of dissection may be facilitated by continued submucosal injection of epinephrine solution as the dissection continues toward the apex of the prolapse. Four polyglycolic acid sutures (2-0) are placed sequentially in the rectal muscle at the anterior, posterior, and lateral positions as the dissection continues. These sutures plicate the muscle and provide traction. The dissection is carried into the apex and the mucosa which has been dissected free is transected. The polyglycolic acid sutures (2-0) are used to reconnect the edges of the bowel. Four additional sutures are used to approximate the bowel between the placating sutures. Additional 3-0 sutures are placed in an interrupted or running manner to complete the circumferential approximation of the mucosal edges.

Results of Delorme's procedure are summarized in [Table 47-3](#). Reported operative mortality rates from a series of patients treated by Delorme's procedure range from 0% to 2.5%.¹⁸⁻²³ Morbidity reported at 0% to 32% includes hemorrhage, anastomotic dehiscence, stricture, diarrhea, and urinary retention. Recurrence rates (7%–22% at 1–13 years

TABLE 47-3. Results of Delorme's procedure

Authors	No. of patients	Recurrence (%)
Uhlig and Sullivan ¹⁸	44	7
Monson et al. ¹⁹	27	7
Senapati et al. ²⁰	32	13
Oliver et al. ²¹	41	22
Tobin and Scott ²²	43	26
Graf et al. ²³	14	21

postoperatively) are higher than with a perineal rectosigmoidectomy. Incontinence is improved in 40%–50% of patients.¹⁶ Constipation was not a problem in most series.

Thiersch Procedure

Anal encirclement was first described by Thiersch in 1891.²⁴ He placed a silver wire subcutaneously around the anus with the patient under local anesthesia. The mechanism of this procedure was to mechanically supplement or replace the anal sphincter and stimulate a foreign body reaction in the perianal area. There were several reports of the use of this procedure in the early part of this century, especially in Europe.²⁵

William Gabriel is credited with reviving interest in Thiersch's operation in the 1950s.²⁵ He reported on 25 cases of incontinence or minor rectal prolapse. He did not recommend this operation for major degrees of prolapse.

For this operation, the patient is placed in the prone jack-knife, lithotomy, or left lateral position (Figure 47-5). A local anesthetic is administered and a radial incision made on both

sides of the anus about 2 cm from the anal verge. A curved hemostat or special circular needle is used to tunnel from one incision to the other above the anoperineal ligament anterior to the anus, keeping external to the external anal sphincter. The material for encirclement is brought through the tunnel. Tunneling is continued posterior to the anus above the anococcygeal ligament and the encircling material brought through so that the two ends meet.²⁶ The encircling material is then secured by tying snugly over an index finger in the anus. A variety of materials used for encirclement include nylon, silk, silastic rods, silicone, Marlex mesh, Mersilene mesh, fascia, tendon, and Dacron.¹⁰ Complications of this procedure include breakage of the suture or wire, fecal impaction, sepsis, and erosion into the skin or anal canal. The Thiersch operation does not correct the prolapse but narrows the anus enough that the prolapse is confined to the rectum, accomplishing this goal in 54%–100% of cases.²⁷ Because of its failure to correct prolapse and the morbidity of this procedure, it is reserved for the most seriously ill patients who are unable to undergo one of the previously described perineal procedures. Results of the Thiersch procedure are summarized in Table 47-4.

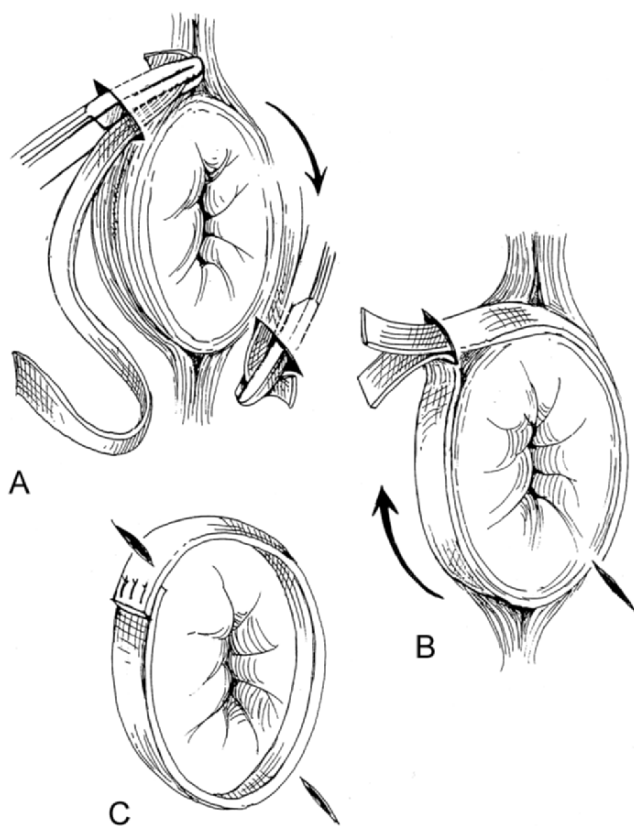


FIGURE 47-5. Anal encirclement (Thiersch). **A** Lateral incisions with prosthetic mesh tunneled around the anus. **B** Mesh completely encircling the anal opening. **C** Completed anal encirclement procedure. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

Abdominal Procedures

Abdominal Rectopexy and Sigmoid Colectomy

Abdominal rectopexy and sigmoidectomy was initially described in 1955 by Frykman³⁵ for management of full-thickness rectal prolapse and it remains an essential treatment option. The operation consists of four essential components: 1) complete mobilization of the rectum down to the levator musculature, leaving the lateral stalks intact; 2) elevation of the rectum cephalad with suture fixation of the lateral rectal stalks to the presacral fascia just below the sacral promontory; 3) suture of the endopelvic fascia anteriorly to obliterate the cul-de-sac; and 4) sigmoid colectomy with anastomosis. The modern components of the operation are essentially the same with the exception that most surgeons no longer obliterate the cul-de-sac (Figure 47-6). Results with abdominal rectopexy and sigmoidectomy are summarized in Table 47-5.

TABLE 47-4. Results of Thiersch procedure

Authors	No. of patients	Recurrence (%)	Mortality (%)	Morbidity (%)
Jackaman et al. ²⁸	52	33	—	—
Labow et al. ²⁹	9	0	—	0
Hunt et al. ³⁰	41	44	—	37
Poole et al. ³¹	15	33	—	33
Vongsangnak et al. ³²	25	39	—	59
Earnshaw and Hopkinson ³³	21	33	—	—
Khanduja et al. ³⁴	16	0	—	25

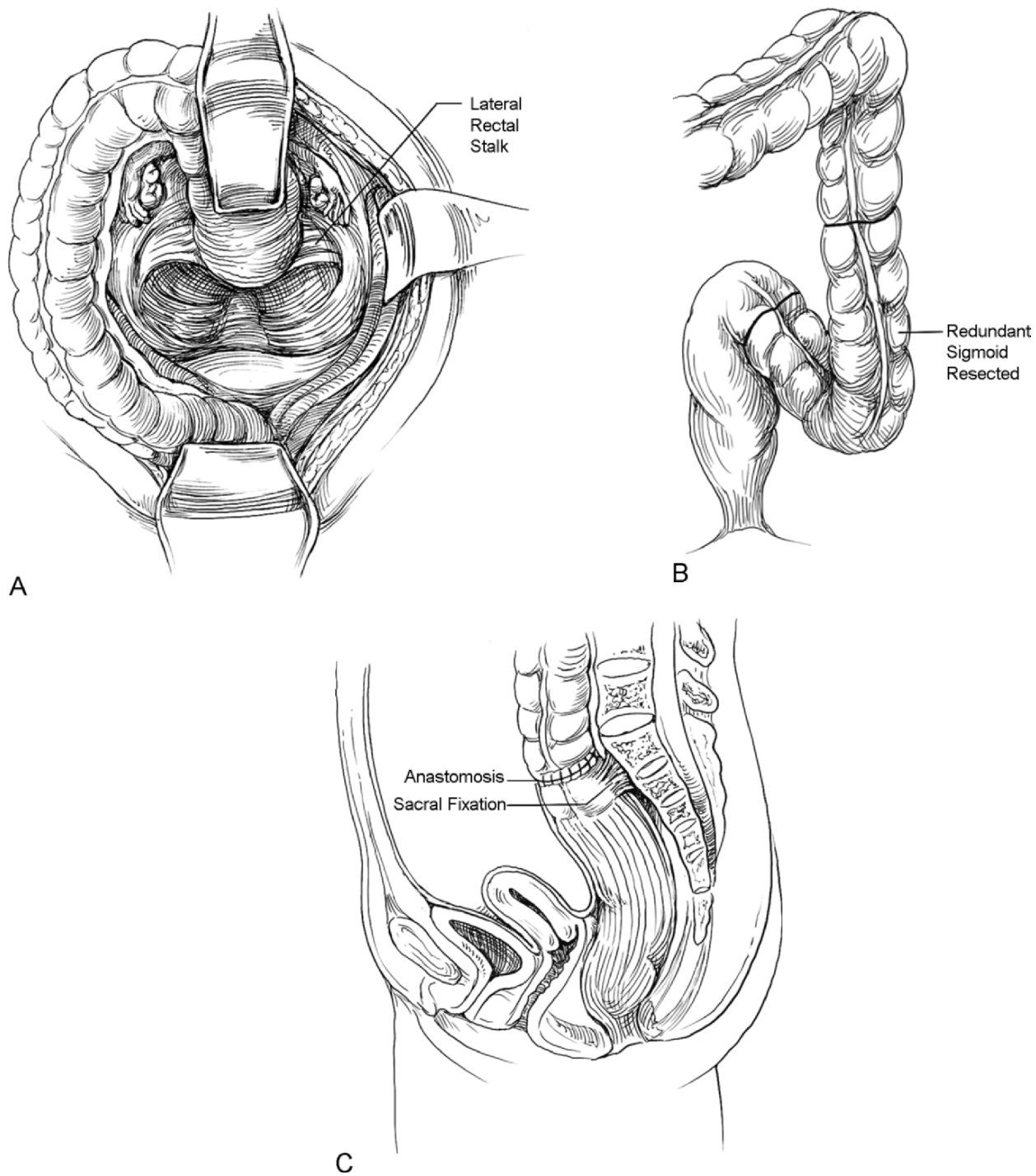


FIGURE 47-6. Abdominal rectopexy and sigmoidectomy. **A** Rectum is fully mobilized in the posterior avascular plane. **B** Redundant sigmoid colon is resected. **C** Anastomosis is completed and rectopexy sutures are placed.

Abdominal Rectopexy

Simple suture rectopexy without sigmoid colectomy has been reported as an effective surgical treatment for rectal prolapse.^{43,44} Typically, this operation has been used in patients

who do not have associated constipation with prolapse. The rectum is mobilized down to the levator floor preserving the lateral ligaments. The lateral rectal stalks are then sutured to the presacral fascia just below the sacral promontory, using

TABLE 47-5. Results of abdominal rectopexy and sigmoid colectomy

Authors	No. of patients	Recurrence (%)	Mortality (%)	Morbidity (%)
Watts et al. ³⁶	102	1.9	00	04
Husa et al. ³⁷	48	09	02.1	00
Sayfan et al. ³⁸	13	00	00	23
McKee et al. ³⁹	09	00	00	00
Luukkonen et al. ⁴⁰	15	00	06.7	20
Canfrere et al. ⁴¹	17	00	00	—
Huber et al. ⁴²	39	00	00	7.1

a nonabsorbable suture, such as Prolene. Results are summarized in [Table 47-6](#).

Ripstein Procedure

Described in 1963 by Ripstein and Lanter,⁴⁵ the Ripstein operation had been one of the most popular procedures for management of rectal prolapse. It is currently seldom used, probably because of the success of alternate therapies and because this particular operation requires the use of prosthetic material, placed around the rectum.

The rectum is mobilized posteriorly down to the coccyx. A 5-cm piece of prosthetic mesh (Marlex or Prolene) is sutured to the presacral fascia, 5 cm below the sacral promontory in the midline. The rectum is retracted cephalad and the lateral edges of the sling are wrapped around the rectum and sutured to it ([Figure 47-7](#)). Care must be taken to avoid making the wrap too tight and causing an obstruction. Results are summarized in [Table 47-7](#).

Ivalon Sponge

The Ivalon (polyvinyl alcohol) sponge wrap operation, first described in 1959 by Wells,⁵⁰ is currently the most popular operation for rectal prolapse in the United Kingdom. The operation is performed with the patient in the lithotomy position and the rectum is mobilized posteriorly down to the levator ani. Anterior mobilization of the rectum is also performed. A piece of Ivalon is then placed in the pelvis, sutured to the presacral fascia with nonabsorbable sutures, and then wrapped around the rectum which has been retracted cephalad. The sponge is then sutured to the rectum such that only three-fourths of the rectum is wrapped (the anterior rectum is left free of the sponge). The peritoneum is then closed over the sponge excluding it from the peritoneal cavity ([Figure 47-8](#)). In the United States, surgeons have used praline or Marlex mesh instead of a polyvinyl alcohol sponge

TABLE 47-6. Results of abdominal rectopexy

Authors	No. of patients	Recurrence (%)	Mortality (%)
Loygue et al. ⁴³	140	3.6	01.4
Blatchford et al. ⁴⁴	42	02	00

to perform a posterior wrap. Results of posterior wraps are summarized in [Table 47-8](#).

Laparoscopic Rectopexy

Laparoscopic approaches to the management of full-thickness rectal prolapse, including rectopexy alone, or in combination with sigmoid colectomy have been reported to have comparable success rates and morbidity to open surgery, with the added benefit of shorter hospital stays. These laparoscopic approaches likely represent the future direction of definitive operative management.⁵²⁻⁵⁵ Heah et al.⁵³ reported on 25 patients, with a mean age of 72 years, who underwent laparoscopic rectopexy without resection for management of full-thickness prolapse. Four of 25 patients (16%) required conversion to open operation. Morbidity occurred in 3 of 25 patients (12%). There were no cases of recurrent prolapse or mortality.

Ashari et al.⁵⁴ reported a 10-year, single-center experience with laparoscopically assisted resection rectopexy for management of full-thickness rectal prolapse in 117 patients. Mortality occurred in 1 of 117 patients (0.8%) and morbidity in 9%. Seventy-seven of the 117 patients (66%) were followed a median period of 62 months. Recurrent full-thickness rectal prolapse occurred in 2 of 77 patients (2.5%) and mucosal prolapse occurred in 14 (18%). Operative times decreased by 39% (from 180 to 110 minutes) over 10 years.

Kairaluoma et al.⁵⁵ reported a case-controlled comparison between open and laparoscopic surgery for rectal prolapse involving 106 patients (53 in each group) and included both rectopexy alone and rectopexy combined with resection. Morbidity and mortality were statistically no different between the laparoscopic group and the open surgery controls. Recurrent full-thickness rectal prolapse occurred in 6% of the laparoscopic group and 13% of the open surgery group but this was not statistically significant ($P = .186$). Hospital stay was significantly shorter in the laparoscopic group than in the open surgery controls for both rectopexy alone and for rectopexy combined with sigmoid colectomy.

Recurrent Prolapse

As discussed previously, recurrence is not uncommon after surgical treatment of prolapse. Depending on the specific initial therapy selected, recurrent full-thickness rectal prolapse can occur in more than 50% of patients, although most recent reports place recurrent prolapse after resection with rectopexy to be less than 10%. Typically, perineal operations for prolapse have a higher risk of recurrence compared with abdominal approaches. Over a 30-year period, Hool et al.⁵⁶ reported recurrent rectal prolapse in 24 of 234 patients (10%). Nine of the 24 recurrences occurred after an initial perineal operation and 15 of 24 recurrences occurred after an initial abdominal approach.

When full-thickness rectal prolapse recurs, it is important to reevaluate the patient for both constipation and other

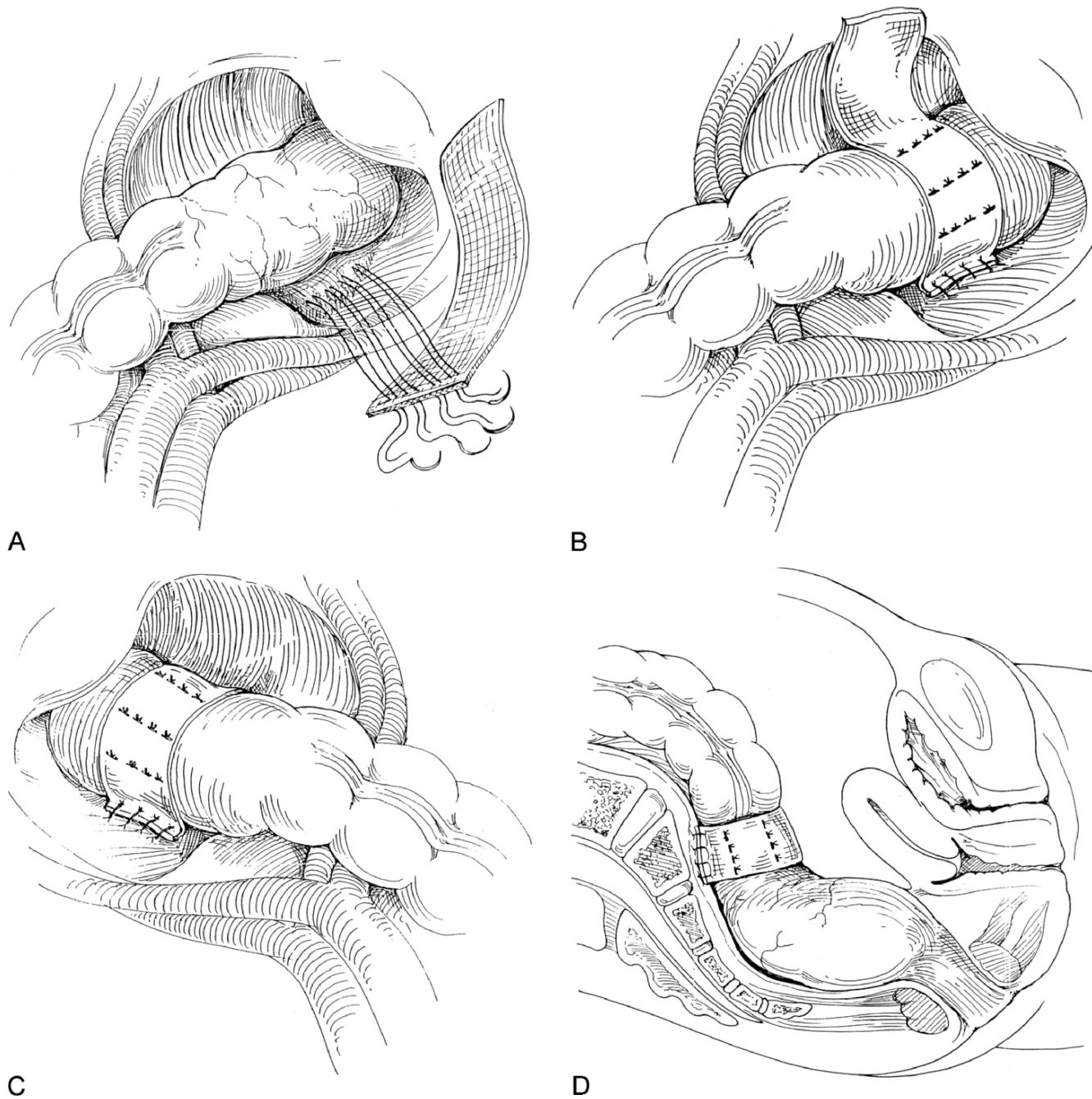


FIGURE 47-7. Mesh rectopexy (Ripstein). **A** Posterior fixation of sling on one side. **B** Sling brought anteriorly around mobilized rectum. **C** Sling fixed posteriorly on the opposite side. **D** Sagittal view of the completed rectopexy. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

pelvic floor abnormalities in order to tailor the management to address those issues. Therefore, patients with recurrent prolapse will require evaluation in the anorectal physiology laboratory with manometry and defecography. Patient comorbid conditions will also have an important role in treatment selection, as was likely the case in selecting the initial operation.

TABLE 47-7. Results of Ripstein procedure

Authors	No. of patients	Recurrence (%)	Mortality (%)	Morbidity (%)
Ripstein and Lanter ⁴⁵	289	00	00.3	—
Gordon and Hoexter ⁴⁶	1111	02.3	-	16.6
Eisenstadt et al. ⁴⁷	30	00	00	13.3
Tjandra et al. ⁴⁸	134	08	00.6	21
Winde et al. ⁴⁹	35	00	00	28

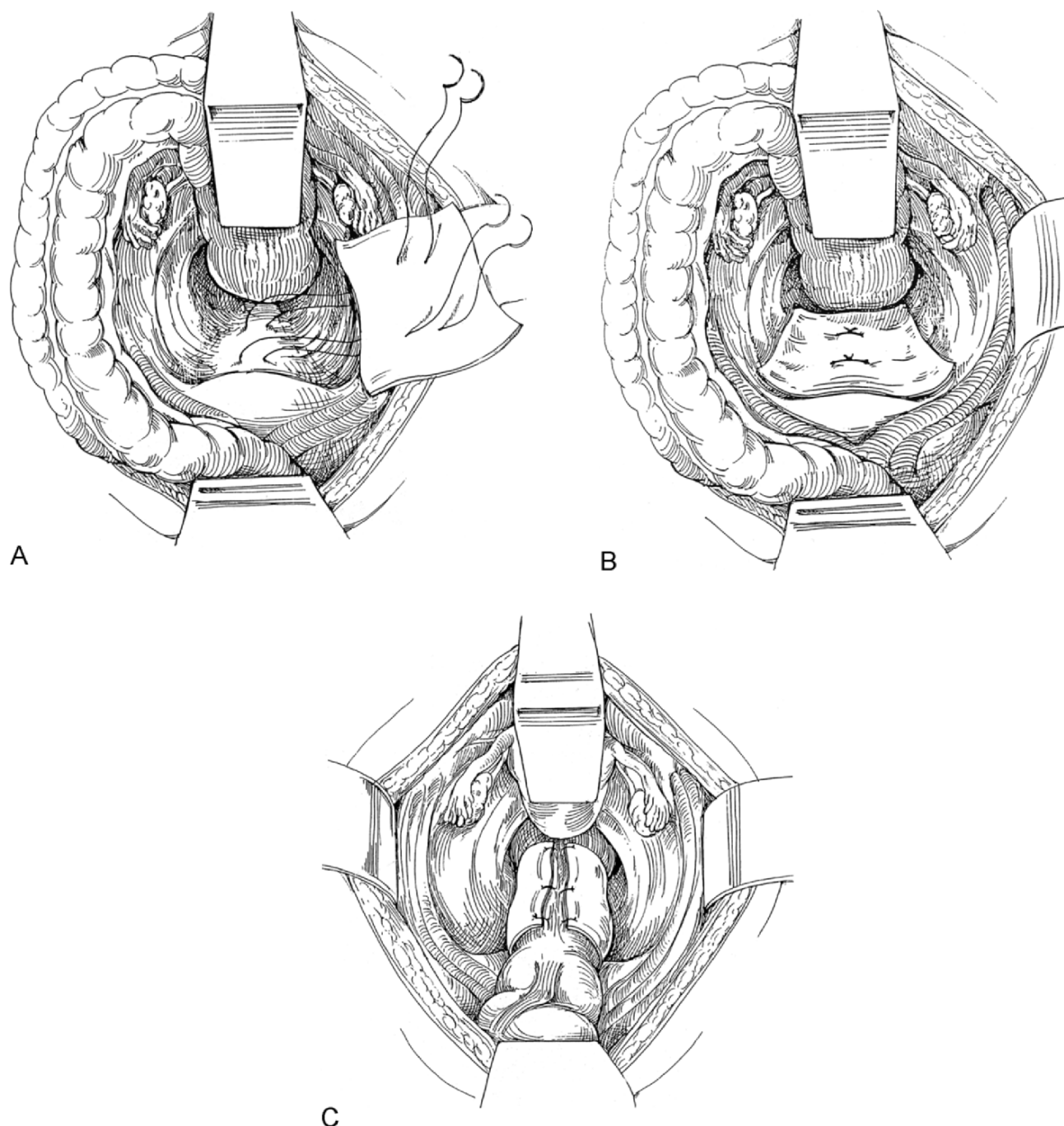


FIGURE 47-8. Ivalon (polyvinyl alcohol) sponge rectopexy (Wells). **A** Polyvinyl sponge being fixed to the sacrum. **B** Sponge in place before fixation to the rectum. **C** Incomplete encirclement of the rectum anteriorly with the sponge sutured in place. (From Beck and Whitlow.³ Copyright 2003 by Taylor & Francis Group LLC (B). Reproduced with permission of Taylor & Francis Group LLC (B) in the format Textbook via Copyright Clearance Center).

A major consideration in determining the best surgical option to treat the recurrent prolapse is the residual blood supply of the remaining large bowel. Any patient who has undergone a prior rectal or sigmoid resection with anastomosis requires very careful evaluation before undergoing a secondary procedure. The initial operative procedure performed for prolapse has a dominant role in determining the selection

of the next operation. In such patients, the obvious risk to a secondary resection is ischemia to the segment of large intestine between two anastomoses.

Recurrent full-thickness rectal prolapse can be successfully managed using the same operative options applied to initial disease. Reports in the literature place successful treatment of recurrence at between 85%–100%.^{57,58} Unfortunately, although

TABLE 47-8. Results of Ivalon sponge operation

Authors	No. of patients	Recurrence (%)	Mortality (%)	Morbidity (%)
Sayfan et al. ³⁸	16	00	00	12.5
Luukkonen et al. ⁴⁰	15	00	00	13.3
Novell et al. ⁵¹	31	3	00	19

most authors indicate the initial operative technique, the recurrence, and the secondary operative technique, they fail to adequately describe their rationale for selection of the secondary procedure. For that reason, there is very little data upon which to base an intelligent treatment decision for management of recurrent prolapse. There is no specific algorithm available that can be applied to select the best operation for treating recurrence, except that many reports suggest treating young patients using an abdominal approach and elderly patients using a perineal approach. The treating surgeon is left to make an individualized recommendation from the options that are summarized in Table 47-9. Also, the bowel dysfunction associated with prolapse, including constipation and diarrhea, is largely unimproved after correction of the recurrence.⁵⁶⁻⁵⁸

Fengler et al.⁵⁷ reported the results of managing recurrent full-thickness rectal prolapse in 14 patients who had initially undergone perineal rectosigmoidectomy (10), anal encirclement (2), Delorme procedure (1), and anterior resection (1). The average length of time to recurrence was 14 months. Salvage operations performed to manage the recurrence included: redo perineal rectosigmoidectomy (7), abdominal rectopexy (1), resection + rectopexy (2), Delorme procedure (1), anal encirclement (1). Patients were followed for 50 months after treatment for their recurrence. One patient died from an unrelated problem. Among the 13 remaining patients, no patient experienced a re-recurrence of the prolapse. Successful management of the recurrent prolapse failed to resolve fecal incontinence in three patients.

Pikarsky et al.⁵⁸ reported on 27 patients with recurrent full-thickness rectal prolapse. Initial operations included: abdominal rectopexy (7), Delorme procedure (7), perineal rectosigmoidectomy (7), anal encirclement (4), and resection rectopexy (2). Operations performed for recurrence included: perineal rectosigmoidectomy (14), resection rectopexy (8), rectopexy (2), pelvic floor repair (2), and Delorme procedure (1). Re-recurrence of prolapse occurred in 4 of 27 (15%) after a median follow-up period of 24 months.

TABLE 47-9. Management options for recurrent rectal prolapse

Initial operation	Options for management of recurrence
Perineal rectosigmoidectomy	Redo perineal rectosigmoidectomy Abdominal rectopexy (avoid resection)
Abdominal rectopexy	Redo abdominal rectopexy (±sigmoid colectomy) Perineal rectosigmoidectomy
Abdominal rectopexy + resection	Redo abdominal rectopexy (±re-resection) Avoid perineal rectosigmoidectomy

If the patient has undergone an initial perineal rectosigmoidectomy, then a repeat perineal rectosigmoidectomy or abdominal rectopexy can be safely performed. However, in such cases, abdominal rectopexy with sigmoid colectomy should be avoided because of the risk of ischemia to the retained rectal segment. For those patients who have undergone prior abdominal rectopexy but who now have recurrent prolapse, a redo abdominal rectopexy is an acceptable approach.

Solitary Rectal Ulcer Syndrome and Colitis Cystica Profunda

Solitary rectal ulcer syndrome (SRUS) and colitis cystica profunda (CCF) are uncommon conditions frequently associated with rectal prolapse.⁵⁹ SRUS is a clinical condition characterized by rectal bleeding, copious mucous discharge, anorectal pain, and difficult evacuation. Despite its name, patients with this condition can have single, multiple, or no rectal ulcers. When present, the ulcers usually occur on the anterior rectal wall just above the anorectal ring. Less frequently, they may occur from just above to 15 cm above the dentate line. Ulcers usually appear as shallow with a “punched out” gray-white base surrounded by hyperemia.

Cystica profunda is a benign condition characterized by mucin-filled cysts located deep to the muscularis mucosae. Although cysts can occur in any segment of the digestive tract submucosa, they are most frequent in the colon and rectum. When these lesions are found in the colon or rectum they are called CCF and appear as nodules or masses on the anterior rectal wall. Patients can be asymptomatic (with the lesions identified on screening endoscopy) or complain of rectal bleeding, mucous discharge, or anorectal discomfort. Most will admit to difficulty with bowel movements. CCF is a pathologic diagnosis whose most important aspect is to differentiate it from colorectal adenocarcinoma. This prevents unnecessary radical operations.

CCP and SRUS are closely related diagnoses and some authors consider them interchangeable. The etiology of these conditions remains unclear, but a common feature is chronic inflammation and/or trauma. The inflammation may result from inflammatory bowel disease, resolving ischemia, or trauma associated with internal intussusception or prolapse of the rectum, direct digital trauma, or the forces associated with evacuating a hard stool.

In symptomatic patients, an endoscopic evaluation of the distal colon and rectum will reveal the lesions described above. Defecography documents intussusception in 45%–80% of patients. The differential diagnosis of both CCF and SRUS includes: polyps, endometriosis, inflammatory granulomas, infectious disorders, drug-induced colitides, and mucus-producing adenocarcinoma. Differentiation among these entities is possible with an adequate biopsy. Biopsies obtained via a rigid proctoscope, or an endoscopic snare excision, may be necessary to obtain enough tissue for an accurate

diagnosis. CCF is characterized pathologically by mucous cysts lined by normal columnar epithelium located deep to the muscularis mucosae. The overlying mucosa may be normal or ulcerated and the submucosa surrounding the cysts is fibrotic and contains a mixed inflammatory infiltrate. In adenocarcinoma, the epithelium is dysplastic and the surrounding stroma is reactive.

Treatment is directed at reducing symptoms or preventing some of the proposed etiologic mechanisms. Conservative therapy (high fiber diet and modifying bowel movements to avoid straining) will reduce symptoms in most patients and should be tried first. Patients without rectal intussusception should be offered biofeedback to retrain their bowel function.⁶⁰ Pharmacologic therapy has had limited success, but is reasonable to try before embarking on surgery. If symptoms persist, a localized resection may be considered in selected patients.⁶¹ Those suitable for localized resection should be significantly symptomatic, be good surgical risks, and have localized, accessible areas of disease. Patients with prolapse are considered for surgical treatment [abdominal rectopexy, segmental resection and rectal fixation, perineal proctectomy (Altemeier), or a mucosal proctectomy (Delorme)]. Those without prolapse may be offered excision which varies from a transanal excision to a major resection with coloanal pullthrough.

Conclusion

Optimum management of patients with rectal prolapse requires careful patient evaluation for synchronous functional bowel disorders. Although the precise etiology of rectal prolapse remains unclear, the condition is frequently associated with constipation and straining and, intuitively these coexisting symptoms seem to have a role in the development of prolapse in many patients. Management of any associated constipation, either medically or by the addition of sigmoid colectomy, seems important to the ultimate outcome of treatment, although it remains unclear as to whether successful management of constipation results in a lower risk of recurrent prolapse. Fecal incontinence is a frequent complication of full-thickness rectal prolapse; unfortunately, successful treatment of the prolapse results in only a 50% chance of improvement in preexisting fecal incontinence.

Operative management can be divided into abdominal approaches and perineal approaches. Generally, abdominal rectopexy, with or without resection, has a higher morbidity but a much lower risk of recurrence than perineal rectosigmoidectomy. Selection of the best specific procedure for a given patient remains highly individualized, at the physician's discretion, and depends on variables such as the patient's general medical condition, comorbid disorders, the presence of incontinence or constipation, and any prior surgery for prolapse. Typically, the clinician balances the risk of recurrent prolapse against the operative morbidity (e.g., abdominal

rectopexy versus perineal rectosigmoidectomy). Therapeutic options such as anal encirclement and placement of mesh are not routinely performed in the United States given the reasonably good results achieved with either abdominal rectopexy (\pm sigmoid colectomy) or perineal rectosigmoidectomy. Laparoscopic rectopexy with or without sigmoid colectomy seems to be both safe and effective and will likely replace open abdominal surgery in the management of rectal prolapse. At this time, it is unclear whether laparoscopic rectopexy is more effective and is as safe as perineal rectosigmoidectomy for elderly, high-risk patients.

SRUS and CCF are uncommon colorectal conditions associated with prolapse. As benign conditions, efforts are directed to establishing the diagnosis, excluding malignancy, and treating symptoms. A directed history, physical examination, and endoscopic biopsy will confirm the diagnosis. Therapy to modify bowel movements and habits has had the most success. If these measures fail, surgical therapy to correct rectal prolapse or locally excise the lesions may be considered.

References

1. Moschcowitz AV. The pathogenesis, anatomy and cure of prolapse of the rectum. *Surg Gynecol Obstet* 1912;15:7–21.
2. Broden B, Snellman B. Procidentia of the rectum studied with cineradiography: a contribution to the discussion of causative mechanism. *Dis Colon Rectum* 1968;11:330–347.
3. Beck DE, Whitlow CB. Rectal prolapse and intussusception. In: Beck DE, ed. *Handbook of Colorectal Surgery*. 2nd ed. New York: Marcel Dekker; 2003:301–324.
4. Spencer RJ. Manometric studies in rectal prolapse. *Dis Colon Rectum* 1984;27:523–525.
5. Prasad ML, Pearl RK, Abcarian H, Orsay CP, Nelson RL. Perineal proctectomy, posterior rectopexy, and postanal levator repair for the treatment of rectal prolapse. *Dis Colon Rectum* 1986;29:547–552.
6. Altemeier WA, Culbertson WR, Schowengerdt CJ, Hunt J. Nineteen years' experience with the one stage perineal repair of rectal prolapse. *Ann Surg* 1971;173:993–1006.
7. Ramanujam PS, Venkateh KS. Perineal excision of rectal prolapse with posterior levator ani repair in elderly high risk patients. *Dis Colon Rectum* 1988;31:704–706.
8. Friedman R, Mugga-Sullam M, Freund HR. Experience with the one stage perineal repair of rectal prolapse. *Dis Colon Rectum* 1983;26:789–791.
9. Gopal FA, Amshel AL, Shonberg IL, Eftaiha M. Rectal procidentia in elderly and debilitated patients. Experience with the Altemeier procedure. *Dis Colon Rectum* 1984;27:376–381.
10. Finlay IG, Aitchison M. Perineal excision of the rectum for prolapse in the elderly. *Br J Surg* 1991;78:687–689.
11. Williams JG, Rothenberger DA, Madoff RD, Goldberg SM. Treatment of rectal prolapse in the elderly by perineal rectosigmoidectomy. *Dis Colon Rectum* 1992;34:209–216.
12. Johansen OB, Wexner SD, Daniel N, Noguera JJ, Jagelman DG. Perineal rectosigmoidectomy in the elderly. *Dis Colon Rectum* 1993;36:767–772.

13. Kim D, Tsang C, Wong W, Lowry A, Goldberg S, Madoff R. Complete rectal prolapse: evolution of management and results. *Dis Colon Rectum* 1999;42:460–469.
14. Azimuddin K, Khubchandani I, Rosen L, Stasik J, Riether R, Reed J. Rectal prolapse: a search for the “best” operation. *Am Surg* 2001;67:622–627.
15. Zbar A, Takashima S, Hasegawa T, Kitabayashi K. Perineal resectosigmoidectomy (Altemeier’s procedure): a review of physiology, technique and outcome. *Tech Coloproctol* 2002;6:109–116.
16. Whitlow CB, Beck DE, Opelka FG, Gathright JB, Timmcke AE, Hicks TC. Perineal procedures for prolapse. *J La State Med Soc* 1997;149:22–26.
17. Delorme E. Sur le traitement des prolapsus du rectum totaux pour l’excision de la muqueuse rectale ou rectocolique. *Bull Mem Soc Chir Paris* 1900;26:499–578.
18. Uhlig BE, Sullivan ES. The modified Delorme operation: its place in surgical treatment for massive rectal prolapse. *Dis Colon Rectum* 1979;22:513–521.
19. Monson JR, Jones AN, Vowden P, Brennan TG. Delorme’s operation: the first choice in complete rectal prolapse? *Ann R Coll Surg Engl* 1986;68:143–146.
20. Senapati A, Nicholls RJ, Chir M, et al. Results of Delorme’s procedure for rectal prolapse. *Dis Colon Rectum* 1994;37(5):456–460.
21. Oliver GC, Vachon D, Eisenstar TE, et al. Delorme’s procedure for complete rectal prolapse in severely debilitated patients. *Dis Colon Rectum* 1994;37(5):461–467.
22. Tobin SA, Scott IHK. Delorme operation for rectal prolapse. *Br J Surg* 1994;81:1681–1684.
23. Graf W, Ejerblad S, Krog M, et al. Delorme’s operation for rectal prolapse in elderly or unfit patients. *Eur J Surg* 1992;158:555–557.
24. Goldman J. Concerning prolapse of the rectum with special emphasis on the operation by Thiersch. *Dis Colon Rectum* 1988;31:154–155.
25. Gabriel WB. Thiersch’s operation for anal incontinence and minor degrees of rectal prolapse. *Am J Surg* 1953;86:583–590.
26. Khanduja KS, Hardy TG Jr, Aguilar PS, et al. A new silicone prosthesis in the modified Thiersch operation. *Dis Colon Rectum* 1988;31:380–383.
27. Williams JG. Perineal approaches to repair of rectal prolapse. *Semin Colon Rectal Surg* 1991;2:198–204.
28. Jackaman FR, Francis JN, Hopkinson BR. Silicone rubber band treatment of rectal prolapse. *Ann R Coll Surg Engl* 1980;62:386–387.
29. Labow S, Rubin R, Hoexter B, Salvati E. Perineal repair of procidentia with an elastic fabric sling. *Dis Colon Rectum* 1980;23:467–469.
30. Hunt TM, Fraser IA, Maybury NK. Treatment of rectal prolapse by sphincteric support and using silastic rods. *Br J Surg* 1985;72:491–492.
31. Poole GV Jr, Pennell TC, Myers RT, Hightower F. Modified Thiersch operation for rectal prolapse. Techniques and results. *Am Surg* 1985;51:226–229.
32. Vongsangnak V, Varma JS, Smith AN. Reappraisal of Thiersch’s operation for complete rectal prolapse. *J R Coll Surg Edinb* 1985;30:185–187.
33. Earnshaw JJ, Hopkinson BR. Late results of silicone rubber perianal suture for rectal prolapse. *Dis Colon Rectum* 1987;30:86–88.
34. Khanduja KS, Hardy TG, Aguilar PS, et al. A new silicone prosthesis in the modified Thiersch operation. *Dis Colon Rectum* 1988;31:380–383.
35. Frykman HM. Abdominal proctopexy and primary sigmoid resection for rectal procidentia. *Am J Surg* 1955;90:780–789.
36. Watts JD, Rothenberger DA, Buls JG, Goldberg SM, Nivatvongs S. The management of procidentia: 30 years experience. *Dis Colon Rectum* 1985;28:96–102.
37. Husa A, Sainio P, Smitten K. Abdominal rectopexy and sitmoid resection (Frykman-Goldberg) operation for rectal prolapse. *Acta Chir Scand* 1988;154:221–224.
38. Sayfan J, Pinho M, Alexander-Williams J, Keighley MRB. Sutured posterior abdominal rectopexy with sigmoidectomy compared with Marlex rectopexy for rectal prolapse. *Br J Surg* 1990;77:143–145.
39. McKee RF, Lauder JC, Poon FW, Aichison MA, Finlay IG. A prospective randomized study of abdominal rectopexy with and without sigmoidectomy in rectal prolapse. *Surg Gynecol Obstet* 1992;174:145–148.
40. Luukkonen P, Mikkonen U, Jarvinen H. Abdominal rectopexy with sigmoidectomy vs rectopexy alone for rectal prolapse: a prospective randomized study. *Int J Colorectal Dis* 1992;7:219–222.
41. Canfrere VG, des Barannos SB, Mayon J, Lehar PA. Adding sigmoidectomy to rectopexy to treat rectal prolapse: a valid option? *Br J Surg* 1994;581:2–4.
42. Huber FT, Stein H, Siewert JR. Functional results after treatment of rectal prolapse with rectopexy and sigmoid resection. *World J Surg* 1995;19:138–143.
43. Loygue J, Hugier M, Malafosse M, Biotois H. Complete prolapse of the rectum: a report on 140 cases treated by rectopexy. *Br J Surg* 1971;58:847–848.
44. Blatchford GJ, Perry RE, Thorson AG, Christensen MA. Rectopexy without resection for rectal prolapse. *Am J Surg* 1989;158:574–576.
45. Ripstein CB, Lanter B. Etiology and surgical therapy of massive prolapse of the rectum. *Ann Surg* 1963;157:259–264.
46. Gordon PH, Hoexter B. Complications of Ripstein procedure. *Dis Colon Rectum* 1978;21:277–280.
47. Eisenstadt TE, Rubin RJ, Salvati EP. Surgical treatment of complete rectal prolapse. *Dis Colon Rectum* 1979;22:522–523.
48. Tjandra JJ, Fazio VW, Church JM, Milsom JW, Oakley JR, Lavery IC. Ripstein procedure is an effective treatment for rectal prolapse without constipation. *Dis Colon Rectum* 1993;36:501–507.
49. Winde G, Reers B, Nottberg H, Berns T, Meyer J, Bunt H. Clinical and functional results of abdominal rectopexy with absorbable mesh graft for treatment of complete rectal prolapse. *Eur J Surg* 1993;159:301–305.
50. Wells C. New operation for rectal prolapse. *Proc R Soc Med* 1959;52:602–603.
51. Novell JR, Osborne MJ, Winslet MC, Lewis AAM. Prospective randomized trial of Ivalon sponge versus sutured rectopexy for full thickness rectal prolapse. *Br J Surg* 1994;81:904–906.
52. Baker R, Senagore AJ, Luchtefeld MA. Laparoscopic-assisted vs. open resection. Rectopexy offers excellent results. *Dis Colon Rectum* 1995;38:199–201.
53. Heah SM, Hartley JE, Hurleey J, Duthie GS, Monson JR. Laparoscopic suture rectopexy without resection is effective

- treatment for full-thickness rectal prolapse. *Dis Colon Rectum* 2000;43:638–643.
54. Ashari LH, Lumley JW, Stevenson AR, Stitz RW. Laparoscopically-assisted resection rectopexy for rectal prolapse: ten years' experience. *Dis Colon Rectum* 2005;48:982–987.
 55. Kairaluoma MV, Viljakka MT, Kellokumpu IH. Open vs. laparoscopic surgery for rectal prolapse: a case-controlled study assessing short-term outcome. *Dis Colon Rectum* 2003;46:353–360.
 56. Hool GR, Hull TL, Fazio VW. Surgical treatment of recurrent complete rectal prolapse. *Dis Colon Rectum* 1997;40:270–272.
 57. Fenger SA, Pearl RK, Prasad ML, et al. Management of recurrent rectal prolapse. *Dis Colon Rectum* 1997;40:832–834.
 58. Pikarsky AJ, Joo JS, Wexner SD, et al. Recurrent rectal prolapse: what is the next good option? *Dis Colon Rectum* 2000;43:1273–1276.
 59. Beck DE. Colitis cystica profunda. In: Johnson LR, ed. *Encyclopedia of Gastroenterology*. San Diego: Elsevier Science; 2003:374–375.
 60. Vaizey CJ, van den Bogaerde JB, Emmanuel AV, Talbot IC, Nicholls RJ, Kamm MA. Solitary rectal ulcer syndrome. *Br J Surg* 1998;85:1617–1623.
 61. Beck DE. Surgical therapy for colitis cystica profunda and solitary rectal ulcer syndrome. *Curr Treat Options Gastroenterol* 2002;5:231–237.