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Rectal Prolapse

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Key Concepts

- Individuals with rectal prolapse may complain of a myriad of symptoms: mucus discharge, rectal bulge, rectal bleeding, fecal incontinence, constipation, tenesmus, pelvic and rectal pain and pressure. Correction of the prolapse does not guarantee functional improvement.
- Successful outcomes measures after rectal prolapse surgery include both prolapse recurrence rates and functional outcomes. The surgeon should be familiar with different abdominal and perineal procedures to choose the best operation for each individual in the setting of initial and recurrent rectal prolapse.
- Laparoscopic ventral rectopexy is associated with functional improvement, low morbidity, and low recurrence rates but has a high learning curve for proficiency and advanced training may be required.
- Robotic rectopexy can be offered safely to patients and has advantages when suturing in the pelvis is required.
- The paradigm for treatment rectal prolapse in the elderly has changed from perineal to abdominal minimally invasive procedures in elderly and high risk patients.
- Rectal prolapse may coexist with vaginal prolapse and multidisciplinary evaluation and treatment should be considered in symptomatic patients.

Introduction

Rectal prolapse or procidentia is defined as extrusion of the full thickness of the circular folds of the rectum through the anal muscles beyond the anal verge. If the rectal wall is prolapsed but does not extend beyond the anus, it is called occult (internal) rectal prolapse or rectal intussusception. Both full-thickness and internal rectal prolapse should be differentiated from mucosal prolapse which occurs when only the rectal or anal mucosa protrudes beyond the anus. Several anatomic conditions are associated with rectal prolapse including a laxity of rectal attachments, a deep Pouch of Douglas cul-de-sac, lack of fixation of the rectum to the sacrum, and a large redundant sigmoid colon (Figure 60-1).

The peak incidence of rectal prolapse is reported in women aged 70 and may be associated with a spectrum of pelvic floor disorders such as vaginal prolapse (enterocele, cystocele, rectocele) and urinary incontinence. These disorders are generally attributed to multiparity and pelvic floor weakness [1]. Women are six times as likely as men to present with rectal prolapse [2]. Approximately one-third of female patients are nulliparous and younger women; men with rectal prolapse tend to suffer from disordered defecation, dysmotility, psychiatric comorbidities, eating disorders, and autism or developmental delays [3, 4].

Symptoms of rectal prolapse may include the feeling of a bulge, mucus drainage and/or fecal accidents, constipation, tenesmus, rectal pressure, pelvic pressure and pain, and rectal bleeding. These symptoms can be debilitating and can result in isolation and depression in affected individuals.

Fecal incontinence is reported in 50–75 % of patients with rectal prolapse [5]. Mucus discharge frequently is described early in the disease process and this can evolve into frank fecal accidents as the prolapsed segment keeps the sphincters open permitting stool to leak. Chronic stretch, trauma, and continuous stimulation of the rectoanal inhibitory reflex by the prolapsing tissue can result in permanent sphincter damage. Pudendal neuropathy has been demonstrated in 50 % of patients with prolapse [6] and may be responsible for denervation related atrophy of the external sphincter musculature [7].

Constipation is reported in 25–50 % of patients with rectal prolapse [5, 8] and may be associated with colonic dysmotility or pelvic floor dyssynergia. Chronic straining can lead to

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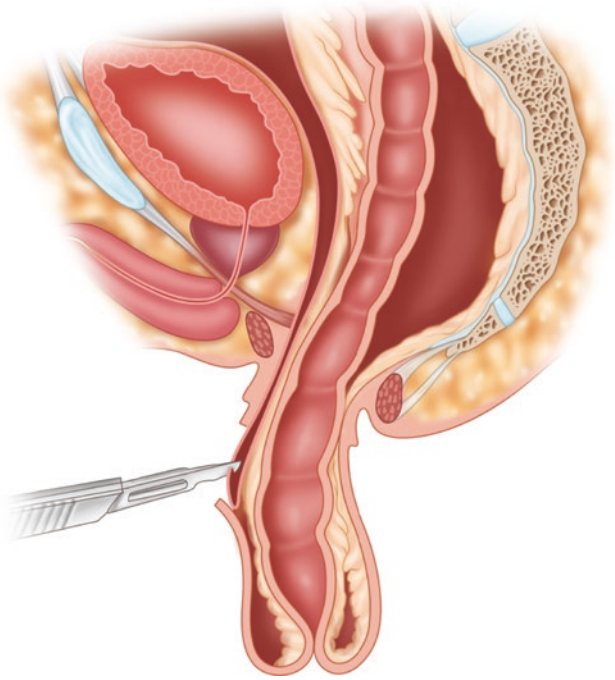

FIGURE 60-1. Cross section of rectal prolapse. Anatomical associations with rectal prolapse include laxity of rectal attachments, deep Pouch of Douglas, lack of fixation to the rectum, and redundant sigmoid colon.

rectal prolapse or the prolapse can induce outlet constipation with the intussuscepting bowel in the rectum creating a blockage of the outlet which is exacerbated by excessive straining.

Patient Evaluation

The evaluation of rectal prolapse should include a complete pelvic floor history and physical examination. An assessment of risk factors should be considered and treatment of constipation with fiber or laxatives should be considered. A screening evaluation with endoscopy in adults is performed to exclude coexisting conditions. If the diagnosis of rectal prolapse is suspected, but not detected on initial examination, the patient should be evaluated standing, squatting or on the commode in the straining position. If rectal prolapse is still elusive and the history is suggestive of a prolapse, the patient can be asked to photograph the prolapse at home. For those patients with vaginal prolapse or urinary symptoms, urogynecological examination and urodynamics should be considered for multidisciplinary pelvic floor repair. Additional testing such as anorectal physiology testing rarely changes the operative strategy but they can often guide treatment for associated functional abnormalities [9]. Defecography may reveal associated defects such as cystocele, vaginal vault prolapse, and enterocele that may require treatment [10, 11].

Non-operative Treatment

Non-operative treatment of rectal prolapse has shown to produce only temporary or symptomatic relief. Reduction of incarcerated rectal prolapse can be performed by coating the prolapse with table sugar to reduce edema and gently push the prolapse above the sphincters [12]. Biofeedback was used to improve postoperative function but has not been reported as a primary therapy [13].

Surgical Approaches for Rectal Prolapse

A single common theory for the cause of rectal prolapse has not been substantiated but the anatomic basis includes a deficient pelvic floor through which the rectum herniates. A deep pelvic cul-de-sac, attenuated ligamentous attachments to the rectum and presacral fascia, and a redundant sigmoid colon are frequently associated with rectal prolapse [14].

Surgery is the only curative treatment for rectal prolapse. A range of surgical procedures are available which differ with respect to approach: abdominal versus perineal. Additionally, the surgeon must decide about the method of fixation that will be used and if bowel will be resected. The optimal operation for rectal prolapse is unclear. Surgeons are inclined to individualize the patient's treatment when it comes to approach thus making it difficult to evaluate and compare results from case series. Low accrual rates for randomized trials and poor quality data continues to be a challenge when reviewing the literature for rectal prolapse surgery. Deen et al. performed a small randomized controlled trial ($n=20$) comparing perineal rectosigmoidectomy with an abdominal approach [15]. The recurrence rate was 10 % for the perineal group compared to 0 % for the abdominal group and functional results were better in the abdominal group. The PROSPER Trial compared the surgical treatments for rectal prolapse in 293 patients [16]. Seventy-eight abdominal procedures and 213 perineal procedures were performed. Overall, rectal prolapse recurrence rates were higher than anticipated but recurrence was not significantly different between groups.

Description of Surgical Interventions

Anal Encirclement

The Thiersch procedure involves reduction of prolapse and placement of a subcutaneous suture or mesh material to encircle the anus, thereby narrowing the anal canal. This procedure does not eradicate prolapse but prevents further descent by providing a mechanical barrier. It is associated

with recurrence rates ranging from 33 to 44 % but can lead to problems with severe outlet constipation. It is rarely recommended and only reserved for patients at high risk of anesthetic complications [17]. In some patients with rectal prolapse and a permanent colostomy, the treatment may be considered to prevent the symptoms of protrusion and mucus drainage.

Perineal Procedures

Delorme

A mucosal sleeve resection was described by Delorme in 1900 and involves stripping the mucosa of the prolapsed segment, plication of the muscle layers, and re-approximation of the mucosa (Figures 60-2, 60-3, 60-4, and 60-5). This procedure is advocated for patients with a short segment of full-thickness rectal prolapse or for patients who are considered "high risk" for abdominal procedures such as those with a "hostile abdomen." Procedure related operative complications are low but prolapse recurrence rates are high in the range of 16–30 % [18–20] (For a description of the procedure, please see Video 60.1 Delorme procedure, reproduced with the permission of the Department of Colon and Rectal Surgery, The Cleveland Clinic Foundation, Cleveland, OH, USA).

Perineal Rectosigmoidectomy

The perineal rectosigmoidectomy or the Altemeier procedure involves excising the prolapsing rectum and creating a low end-to-end stapled colorectal anastomosis or a sutured coloanal anastomosis (Figures 60-6, 60-7, 60-8, 60-9, 60-10, 60-11, and 60-12). This procedure can be combined with a levatorplasty to "tighten" the pelvic floor muscles with the goal to improve continence [21]. Fecal incontinence can be exacerbated after a perineal rectosigmoidectomy which may be due to loss of the rectal reservoir confounded by poor sphincter function. Recurrence rates have been reported as high as 20 % and complications rates (<10 %) include suture line bleeding, pelvic abscess, or anastomotic leak [22] (For a description of the procedure, please see Video 60.2 Altemeier procedure, reproduced with the permission of the Department of Colon and Rectal Surgery, The Cleveland Clinic Foundation, Cleveland, OH).

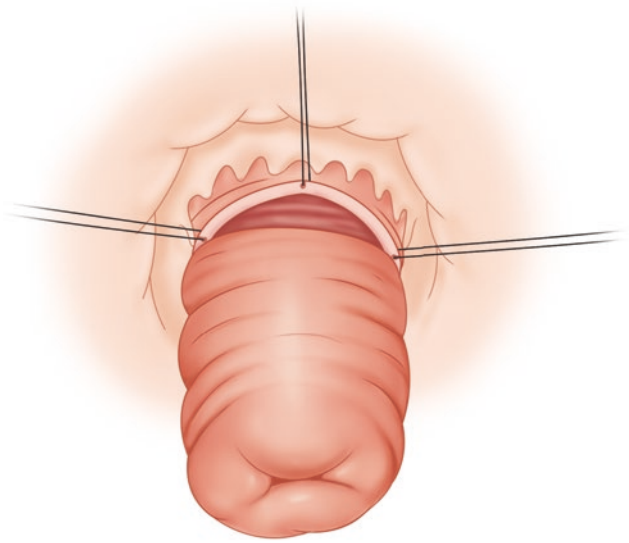

FIGURE 60-2. Delorme procedure. Two centimeters proximal to the dentate line, a circular line is marked out in the mucosa with the bovie. The area is injected with a vasoconstricting agent. An incision is then made through the mucosa but not full thickness through the entire rectal wall. The bovie is an excellent means to make the mucosal incision.

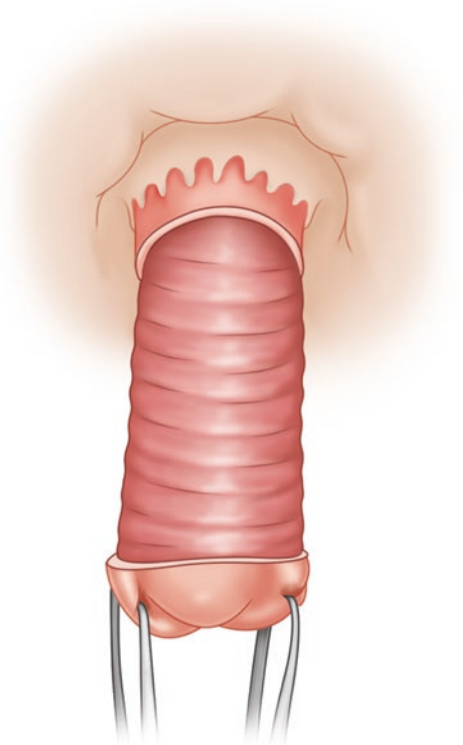

FIGURE 60-3. Delorme procedure. Working cephalad, a sleeve of mucosa is dissected off the muscular layer of the rectal wall. Liberal injection of saline with or without a vasoconstricting agent assists in developing the correct plane. Care is taken to achieve meticulous hemostasis as there are penetrating vessels in this plane of dissection which will need to be tied or coagulated.

Abdominal Procedures

Transabdominal Rectopexy

The goal of rectopexy is to anchor the rectum to the sacrum. This can be performed by open, laparoscopic, or robotic techniques. Fixation of the rectum with suture was first described by Cutait. The suturing is done to correct telescoping

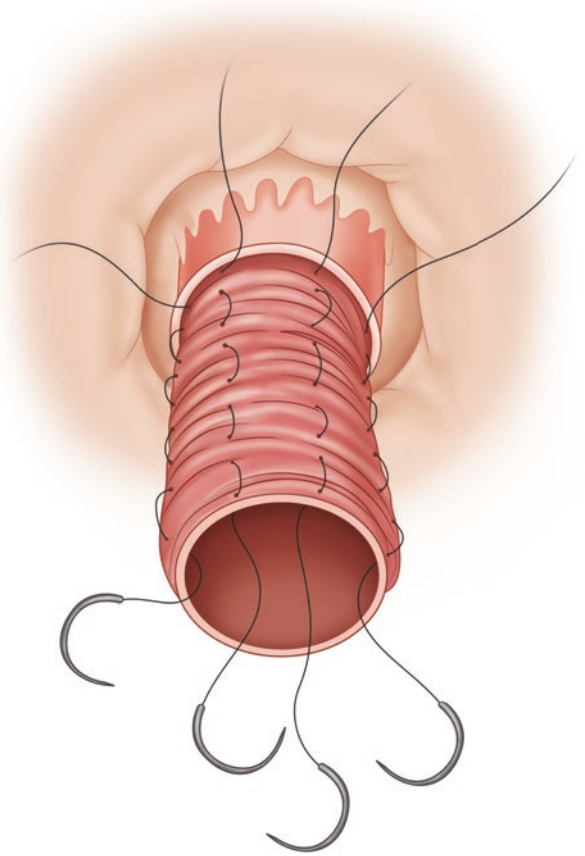

FIGURE 60-4. Delorme procedure. When there is tension at the plane of the mucosal dissection, this is completed. After ensuring that complete hemostasis exists, the muscular layer (the rectal wall) is approximated using sutures starting at the proximal cut mucosal end and including bites of the rectal wall every few centimeters until the other cut edge is reached at the anal region. Placement of these sutures is along the longitudinal axis of the rectal wall and are not full thickness but deep enough to ensure when tied they do not tear through the tissue. As these sutures are placed they compress the wall in an accordion (or concertina) like fashion. Four to six sutures are typically required to stabilize the compressed rectal wall.

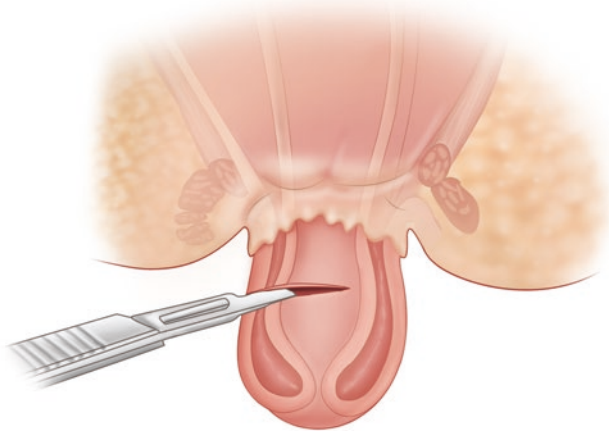

FIGURE 60-6. Altemeier procedure. A circular incision is mapped out approximately 2–5 cm cephalad to the dentate line in the rectal mucosa.

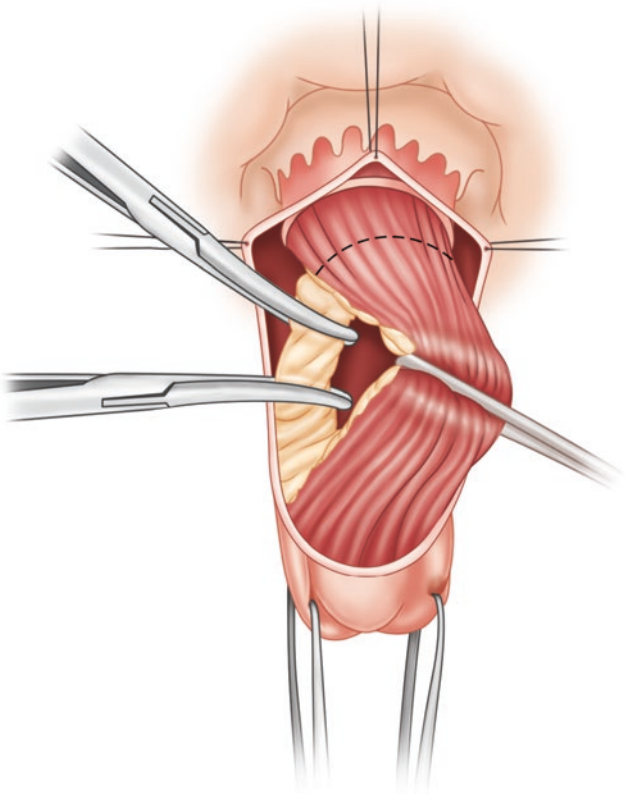

FIGURE 60-7. Altemeier procedure. The incision is deepened and is carried through the entire thickness of the rectal wall. The mesentery to the redundant prolapsed rectum is divided and tied, suture ligated, or cut and sealed using an energy device. Meticulous hemostasis is essential to avoid retracted blood vessels or a mesenteric hematoma.

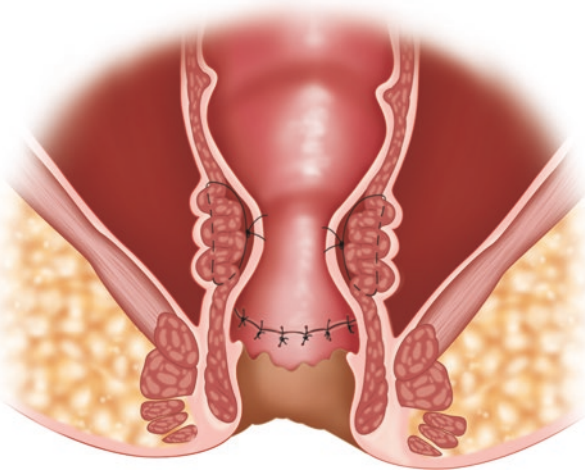

FIGURE 60-5. Delorme procedure. After the sutures that have been placed in the rectal wall are tied down, the two cut ends of the mucosa will be in close proximity. The mucosa is then reapproximated with sutures to create a neo-anastomosis in the anal canal proximal to the dentate line.

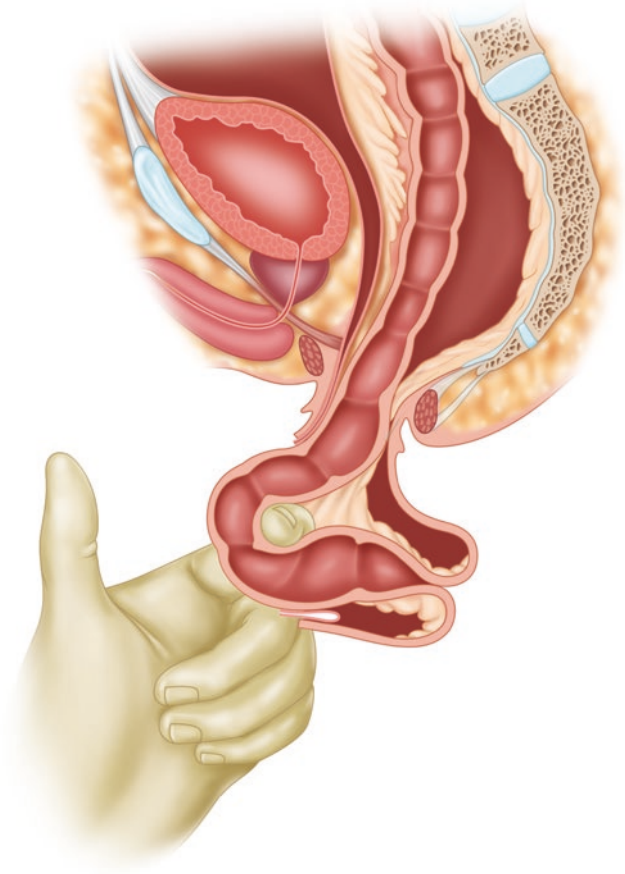

FIGURE 60-8. Altemeier procedure. The rectum is pulled out the anus and the mesentery divided stopping at a point just distal to where the rectum (or sigmoid) no longer easily can be pulled out the anus.

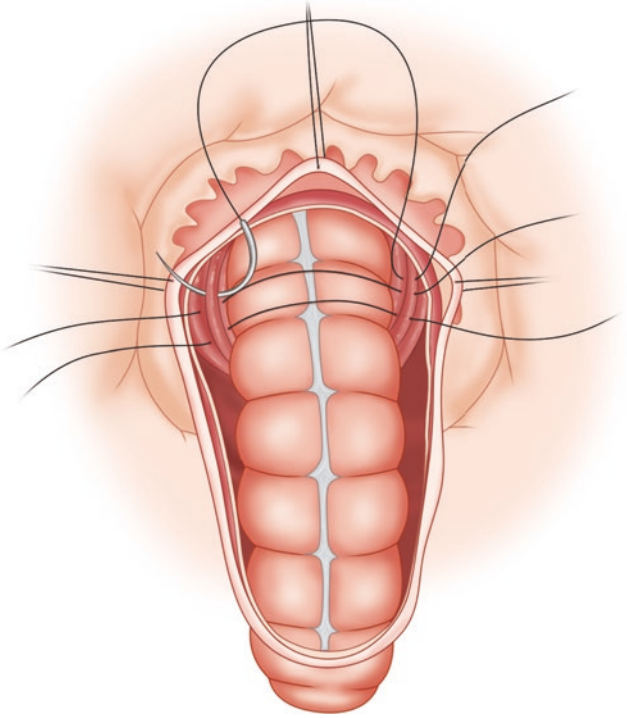

FIGURE 60-9. Altemeier procedure. Anteriorly the levator ani muscles may be approximated with sutures (levatorplasty) which may improve fecal continence.

of the redundant bowel and further fixation of the rectum is anticipated due to the resultant scarring and fibrosis [14]. Prolapse recurrence rates are reported from 0 to 9 % [23–25]. Mobilization of the rectum can vary based on the technique from circumferential to limited posterior and/or anterior and can include unilateral or bilateral division of the lateral rectal ligamentous attachments.

More extensive rectal mobilization and division of lateral stalks is associated with decreased recurrence rates but may precipitate new onset or worsening constipation [26]. New onset constipation after rectopexy is reported in 15 % of patients whereas 50 % described worsening of preoperative constipation [27]. Denervation of the rectum from the neural efferent nerves residing in the lateral ligaments is thought to contribute to worsening function. Unilateral preservation of a lateral stalk and unilateral fastening of the rectal mesentery to the sacrum should be considered to mitigate worsening function [9].

Transabdominal Resection Rectopexy

Sigmoid resection in conjunction with rectopexy was popularized by Frykman and Goldberg in 1969 [28]. It was thought that sigmoidectomy was associated with a lower recurrence rate and improved functional outcome with a minimal

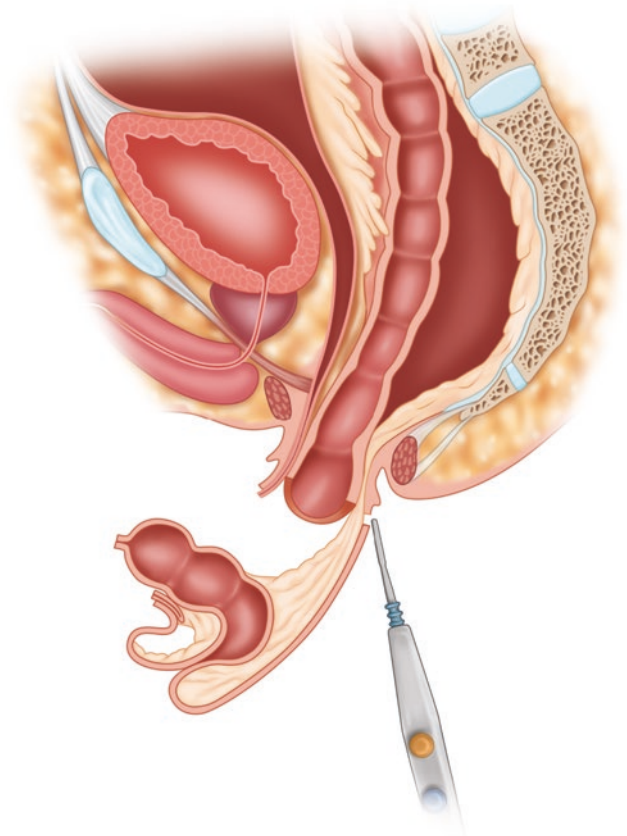

FIGURE 60-10. Altemeier procedure. The redundant rectum and sigmoid colon are excised. It is important to ensure that the proximal bowel has sufficient mesentery to avoid ischemia to this segment.

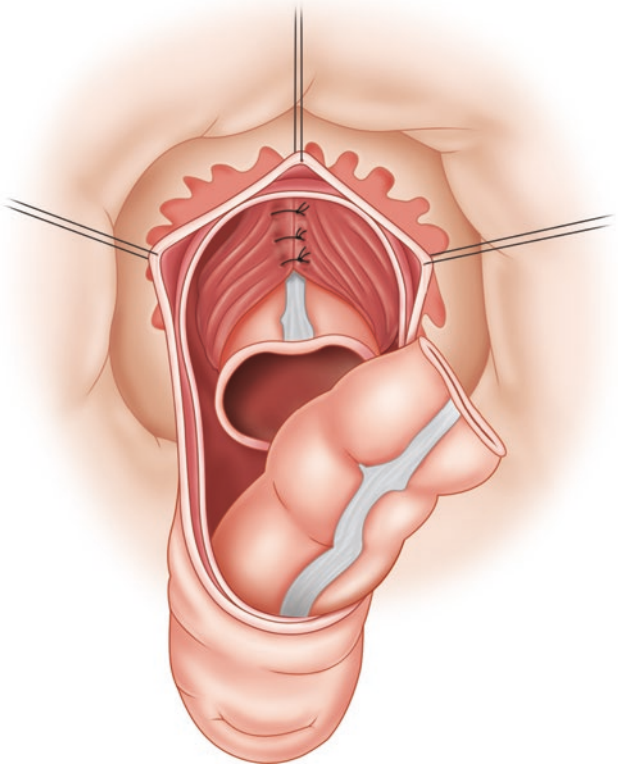

FIGURE 60-11. Altemeier procedure. The redundant rectum and sigmoid colon are excised. It is important to ensure that the proximal bowel has sufficient mesentery to avoid ischemia to this segment. This figure also demonstrates the completed levatorplasty.

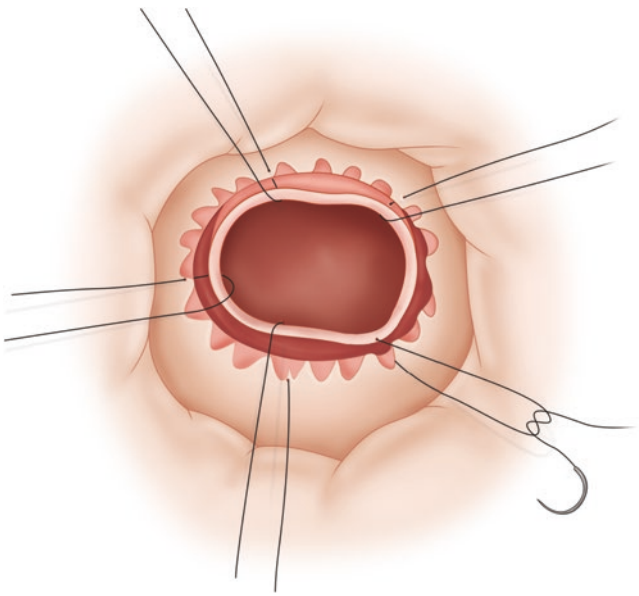

FIGURE 60-12. Altemeier procedure. A tension free end-to-end anastomosis is carried out using sutures (a circular stapled anastomosis also can be done).

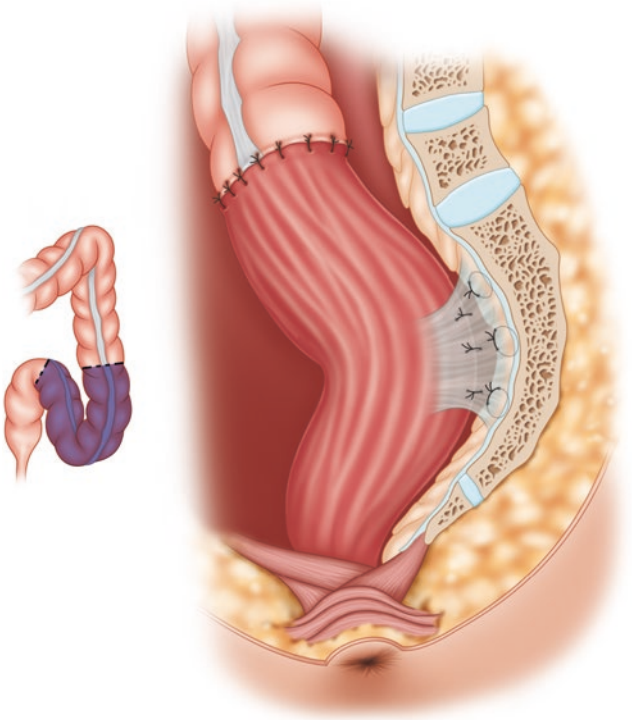

FIGURE 60-13. Resection/rectopexy. The sigmoid colon is excised and an end-to-end anastomosis performed. The rectum is mobilized and non-absorbable sutures are placed in the lateral rectal ligament. The suture is then placed in the anterior sacral ligament (tacks can also be used) to anchor the rectum securely to the sacrum at about the S1 level. It is important to position the needle to enter the sacrum at a right angle. The needle is pushed into the bone and minutely pulled back. Then the curve of the needle is followed when continuing the suture placement at the sacrum. This ensures the suture will be in the anterior sacral ligament. Two sutures on the right are typically placed. Sutures can be placed also on the left side of the rectum, but when tying them down, it is crucial to ensure the rectum is not kinked/occluded.

increase in morbidity [29, 30]. Sigmoid resection may reduce constipation in those who report the symptom preoperatively [31] and resecting the sigmoid may counteract new onset constipation which has been reported after extensive rectal mobilization (Figure 60-13). However, a sigmoid resection is thought to be unnecessary in individuals whose predominant complaint is fecal incontinence [32]. For some patients with confirmed slow colonic motility, sigmoid resection is an inadequate operation and a subtotal colectomy should be considered [33]. The American Society of Colon and Rectal Surgeons in its 2011 Clinical Practice Guideline *Practice Parameters for the Management of Rectal Prolapse* states that "a sigmoid resection may be added to rectopexy in patient with prolapse and preoperative constipation, but it is not necessary in those without constipation" [9].

In the USA, laparoscopic resection rectopexy currently is the most common treatment for full-thickness rectal prolapse [34, 35]. However in European countries, sigmoid resection is infrequently performed and laparoscopic ventral rectopexy is preferred.

Mesh Rectopexy

Fixation materials can vary from simple absorbable or non-absorbable suture to biologic or synthetic mesh. Placement of the mesh can include partial anterior rectal encirclement (Ripstein procedure), partial posterior rectal encirclement (Well's procedure), or partial anterior rectal encirclement (D'Hoore ventral rectopexy) prior to attachment of the mesh to the sacrum.

Ripstein Procedure (Anterior Sling Rectopexy)

Ripstein first described this procedure in 1952 [36]. After complete mobilization of the rectum, an anterior sling of fascia lata or synthetic material was fixed to the anti-mesenteric surface of the rectum and each of the sides then sutured to the sacral promontory. The goal is to restore the normal anatomic position of the rectum. Mortality rates are reported to be from 0 to 2.8 % and recurrence rates between 0 and 13 % [27, 37]. Functional outcomes include a trend towards improvement in continence and a mixed response to constipation [38]. One drawback of the original procedure was the potential of the mesh to obstruct the rectum. To limit the incidence of obstruction the procedure was modified to leave a gap in the mesh to avoid narrowing or kinking of the rectum [39]. Currently people performing this procedure will fix the mid portion of a rectangular piece of mesh to the sacrum and bring each arm around the rectum, suturing the arms to the sides of the rectum, leaving a gap in the anti-mesenteric rectal region. Roberts et al. reviewed their experience with Ripstein and noted a 52 % complication rate with a presacral hematoma reported in 8 % [40]. Recurrence rates in men were three times that in women (24 % vs. 8 %, respectively). They speculated that the difference in recurrence rates was due to technical difficulties in mobilizing the rectum in a narrow male pelvis [40]. The Ripstein procedure (even the modified form) is being used less and less due to the morbidity and potential for new rectal outlet difficulties.

Posterior Mesh Rectopexy

A posterior rectopexy utilizing the Ivalon® sponge was a popular procedure in the past. After nearly full mobilization of the rectum, a rectangular piece of sterilized Ivalon sponge was fixed to the presacral fascia using non-absorbable sutures. The rectum was then drawn upward out of the pelvis and the lateral edges of the sponge wrapped around the rectum to encompass three quarters of the circumference and sewn in place. Major complications included pelvic abscess (2.6–16 %) which required drainage and removal of the sponge. The recurrence rates were low presumably due to fixation from the inflammatory process resulting from the infection. However the infection rates were felt to be prohibitory and this sponge is no longer utilized in repairs.

Currently the posterior mesh rectopexy is fashioned after variations of the Well's procedure. Traditionally the rectum is only mobilized on the right enough posteriorly to allow safe suturing or tacking of a prosthetic material to the periosteum or anterior sacral ligament of the sacral promontory. The mesh is sutured to the rectum on the right side. Mortality rates range from 0 to 3 % and recurrence rates are reported to be 3 % [23, 25, 29].

Laparoscopic Ventral Rectopexy

Ventral rectopexy (VR) described by D'Hoore is based on correcting the descent in women of the posterior and middle compartment by mobilizing the rectovaginal septum down to the pelvic floor between the extraperitoneal rectum and the vagina [41]. The rectovaginal septum is reinforced with (traditionally polypropylene) mesh and the mesh is suspended to the sacrum, thus elevating the pelvic floor (Figure 60-14). VR can correct full-thickness rectal prolapse, rectoceles, and internal rectal prolapse and can be combined with vaginal prolapse procedures, such as sacrocolpopexy, in patients with multi-compartment pelvic floor defects.

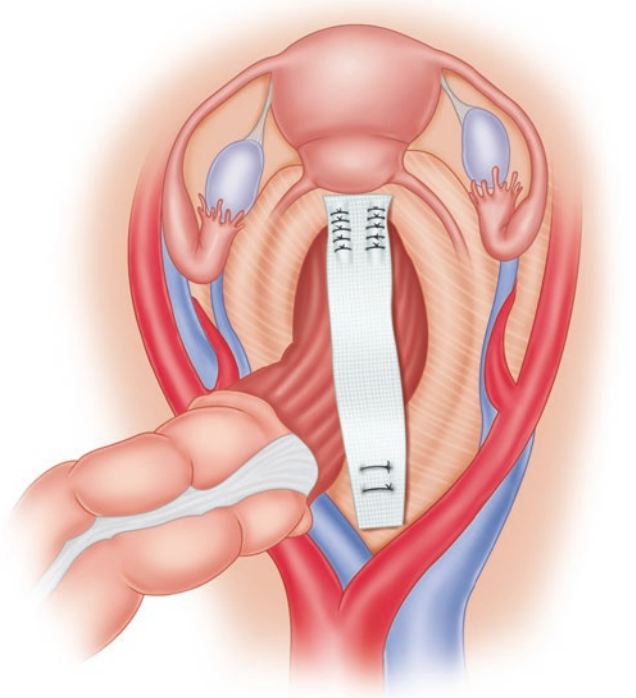

FIGURE 60-14. Ventral rectopexy. The anterior wall of the rectum is mobilized. The mesh (or graft) is attached with sutures to the anterior wall of the rectum. The mesh is then sutured to the anterior sacral ligament or tacked to the sacrum at about the S1 level.

Limiting dissection to the anterior rectum minimizes autonomic nerve damage associated with posterior dissection and division of the lateral stalks. A meta-analysis of 789 patients in 12 published series of laparoscopic VR reports recurrence rates for pelvic organ prolapse at 3.4 % (95 % CI 2.0–4.8) [42]. Complication rates varied between 14 and 47 %. The overall mean decrease in fecal incontinence score was 44.9 % (95 % CI 6.4–22.3) along with a significant decrease in constipation of 23.9 % (95 % CI 6.8–40.9). Laparoscopic VR is the current gold standard for treatment of rectal prolapse in European countries.

Laparoscopic VR is technically demanding and requires a complete ventral dissection of the rectovaginal septum (rectovesical in men) down to the pelvic floor and suturing skills within a confined space that further maximizes the difficulty. Mackenzie and Dixon reported that the proficiency gain learning curve for the relevant clinical and quality-of-life outcomes for laparoscopic VR was between 82 and 105 cases [43]. Proficiency with respect to reduced operating time was reached at 54 cases. Poor technique minimizes the functional benefit and increases the risk for complications. Recurrence after VR may be due to loss of fixation at the sacrum, inadequate mobilization in the rectovaginal space, or incomplete reduction of the prolapse [44].

Adverse outcomes that seem to be unique to VR include mesh complications such as rectal stricture, rectovaginal fistula, pain/dyspareunia, and mesh erosions [45]. Sacral discitis is an uncommon complication that can occur after any type of rectopexy or sacral colpopexy where tacks or sutures are applied to secure the mesh at the site of the sacral promontory [46]. In an analysis of 200 patients undergoing VR, Draaisma et al. noted two patients who experienced mesh infection complicated by discitis at the site of the proximal mesh fixation [47]. Bacterial translocation from the distal rectum to the mesh and ultimately, to the site of fixation at the sacral promontory may explain this complication.

Jonkers et al. retrospectively analyzed laparoscopic resection rectopexy (LRR) and laparoscopic ventral rectopexy (LVR) [48]. A reduction in constipation and incontinence was found in both cohorts but more complications occurred after LRR than LVR. In the absence of more rigorous clinical trials, European surgeons continue to avoid sigmoid resection in favor of VR [49].

Robotic Rectopexy

Robotic procedures offer the advantages of three dimensional visualization, tremor filtering, motion scaling, enhanced dexterity, and superior precision. Developments of robotic surgery have overcome some limitations of conventional laparoscopy such as the difficulties associated with rigid instruments, limited freedom of wrist movement, and technical challenges associated with operating in the confines of a deep pelvis. Disadvantages of robotic surgery include the loss of tactile feedback, the limited range of motion of the robotic arms, increased operative time, and higher equipment costs. Ventral rectopexy is ideally suited for robotic surgery. Robotic rectopexy improves visualization in the deep pelvis and suturing capability and facilitates dissection and mesh placement to the rectovaginal septum. Suturing the mesh to the perineal body, anterior rectum, and lateral rectal attachments is technically easier robotically than laparoscopic suturing. Robotic VR may have a faster learning curve than laparoscopic VR. There have been reports that functional outcomes are improved with robotic VR [50].

Systematic review and meta-analysis comparing the outcomes of robotic rectopexy (RR) versus laparoscopic rectopexy (LR) reveal similar recurrence, conversion, and reoperation rates [51]. The meta-analysis shows that operative time is significantly longer for RR but that RR is associated with a significantly lower blood loss, fewer postoperative complications, and shorter hospital course. However, blood loss was low in both groups (<200 cc) and overall complications were minor.

The cost effectiveness of robotic surgery is debatable. Heemskerk estimated that the cost of robotic compared to laparoscopic surgery exceeds $745 dollars [52]. The experience of the surgical team, learning curve, and surgeon's skill are important aspects that influence operative time and outcomes. Updated systematic analysis of costs could become important to justify increased expense (For a description of robotic rectopexy, please see Video 60.3).

Rectal Prolapse in the Elderly

When considering surgery for rectal prolapse in older patients, the balance between the morbidity of the procedure and overall outcome must be carefully considered. Traditionally age was used as one of the major criteria for deciding the approach (abdominal vs. perineal) for prolapse surgery. The rationale was that perineal procedures can be performed on frail patients with regional anesthesia without the complications and extended recovery associated with abdominal surgery. Fang et al. retrospectively queried the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database, studying surgeon preference for abdominal (open and laparoscopic) versus perineal procedures as it related to age of the patient [53]. The perineal approach was more commonly performed in patients >80 and those at highest risk. Mortality after perineal procedures was 1.3 % compared to 0.35 % for abdominal procedures. There were no deaths in the laparoscopic group. With the acceptance of laparoscopic surgery for rectal prolapse having lower morbidity, surgeons have taken a closer look at a more durable abdominal procedure in elderly patients. Laparoscopic surgery has been proven to be safe in the elderly and is associated with decreased ileus, less wound infections, and a decreased length of stay [54]. Acceptable morbidity has been reported in the elderly patients who underwent a laparoscopic mesh rectopexy [55]. Robotic rec-

topexy has also been shown to be a safe and effective option in patients older than 75 years [56]. Therefore, with the new era of minimally invasive surgical techniques, an increasing number of elderly patients will be considered for an abdominal procedure to address their rectal prolapse.

Recurrent Rectal Prolapse: What Is the NEXT Operation?

Although many studies have described the management of primary rectal prolapse, there are few reports which address the ideal surgical treatment for recurrent rectal prolapse. Unfortunately, a systematic literature review of the surgical management of recurrent rectal prolapse failed to develop a treatment algorithm due to the use of multiple techniques and low quality studies [57]. Considering single center studies, Steele et al. reported significantly more re-recurrences after reoperation using a perineal procedure compared with an abdominal procedure for their patients with recurrent rectal prolapse ($p=0.03$) [58]. This means that perineal procedures which have a higher incidence of recurrence after the primary procedure have an even greater chance at re-recurrence if utilized again for recurrent rectal prolapse. There is a theoretical risk that a redo perineal rectosigmoidectomy can result in a devascularized segment of rectum [59]. However, Ding et al. reported that redo perineal rectosigmoidectomy is as safe and feasible as primary perineal rectosigmoidectomy as long as the prior anastomosis is included in resected specimen [60]. However, this report also supported the previously mentioned studies regarding a substantially higher recurrence rate if a perineal rectosigmoidectomy is used to treat recurrent rectal prolapse [60].

One note of caution, if the initial repair was a sigmoid resection and rectopexy it is not advisable to perform a perineal rectosigmoidectomy if there is recurrent rectal prolapse. Unless the entire colorectal anastomosis is resected when performing the perineal resection for recurrence a devascularized segment of rectum can remain. Similarly, resection rectopexy following a perineal rectosigmoidectomy should be performed with caution as the distal bowel requires an intact marginal artery for its blood supply. Aggressive mobilization could compromise the artery and lead to distal bowel ischemia.

Recurrent mucosal prolapse after a ventral rectopexy can be ameliorated with a Delorme rectal mucosal resection. If the prolapse is too large to be addressed with a Delorme, the recurrence could be addressed by reattachment of the mesh to the sacrum or reinforcement of the existing mesh. In some situations a suture rectopexy or more extensive rectal dissection and resection/rectopexy may be required. We would not advise trying to excise the mesh that is attached to the rectal wall as this could lead to perforation (Table 60-1).

Combined Vaginal and Rectal Prolapse Procedures

Pelvic floor weakness results in multi-compartment dysfunction. Combined anterior/middle and posterior compartment prolapses and resultant bowel symptoms are common in patients with pelvic floor weakness and prolapse [61]. Failure to appreciate multi-compartment pelvic floor disorders along with a lack of collaboration between surgical specialties has resulted in 10–25 % of women with urogynecologic disorders requiring a second surgery for their colorectal dysfunction

Table 60-1. Surgical options for treatment of recurrent rectal prolapse based on the initial procedure

Initial procedure	Redo procedure options	Avoid
Resection rectopexy	1. Repeat resection rectopexy (in setting of constipation) 2. Ventral rectopexy 3. Delorme—patients with mucosal prolapse or limited full-thickness prolapse	Altemeier (perineal proctosigmoidectomy)
Rectopexy	1. Redo rectopexy 2. Resection/rectopexy 3. Ventral rectopexy 4. Altemeier (perineal proctosigmoidectomy) 5. Delorme	
Ventral rectopexy	1. Redo ventral rectopexy (in setting of technical failure) 2. Resection/rectopexy 3. Rectopexy 4. Delorme	Altemeier (perineal proctosigmoidectomy)
Delorme	1. Rectopexy—ventral or sutured 2. Resection/rectopexy 3. Redo Delorme 4. Altemeier (perineal proctosigmoidectomy)	
Altemeier (perineal proctosigmoidectomy)	1. Ventral rectopexy 2. Rectopexy	Resection/rectopexy

[1]. Some units have reported on combined simultaneous treatment of both rectal and genital prolapse [62]. Abdominal sacrocolpopexy with rectopexy for combined middle and posterior compartment prolapse is a safe procedure with a low risk of recurrence and improves bowel function and quality of life [63, 64]. While there could be concern about a bowel resection and mesh placement during the same procedure, one retrospective case series reported no increased risk of complications when a synthetic mesh was utilized for an abdominal sacrocolpopexy was performed in conjunction with a sigmoid resection and anastomosis [65]. A complete history which investigates pelvic floor health, a comprehensive vaginal and rectal examination, and selective advanced testing are crucial to identify and offer optimal treatment when weakness exists in multiple pelvic floor compartments.

Solitary Rectal Ulcer Syndrome

Solitary rectal ulcer syndrome (SRUS) is a disorder of defecation which is often associated with rectal prolapse or internal intussusception. Patients afflicted with this problem present with rectal bleeding, difficult defecation, tenesmus, mucus discharge, and anal pain of unknown etiology. On occasion, the rectal bleeding can be severe enough to require transfusion. On examination there is typically thickened mucosa located anteriorly (Figure 60-15) with ulcers seen in about 23 % of cases and polyps or masses in 74 % [66]. If present, rectal ulcers can be single or multiple shallow ulcers with hyperemic margins and a pale base. Commonly these ulcers occur on the anterior wall just above the sphincter complex but may occur anywhere in the rectal ampulla. This uncommon condition may be misdiagnosed as a polyp or even a cancer because of the alarming appearance seen in some with SRUS. Colitis cystica profunda (CCP) is felt to be a related disorder that produces similar symptoms to SRUS and may have a similar gross appearance. Both are felt to have some element of trauma associated etiology which may be due to intussusception traumatizing the wall as it invaginates downward. This may lead to ischemia which has been speculated to be part of the etiology. Characteristically on biopsy SRUS has fibrotic obliteration of the lamina propria. There can be a thickened muscularis mucosa. Biopsies of CCP demonstrate mucous cysts lined by columnar epithelium deep in the muscularis mucosa. It is conceivable that with trauma from a cephalad prolapsing area of rectum, mucosa could be thrust beneath the surface to produce these mucous cysts. A correct diagnosis of both these conditions is made with accurate pathologic evaluation.

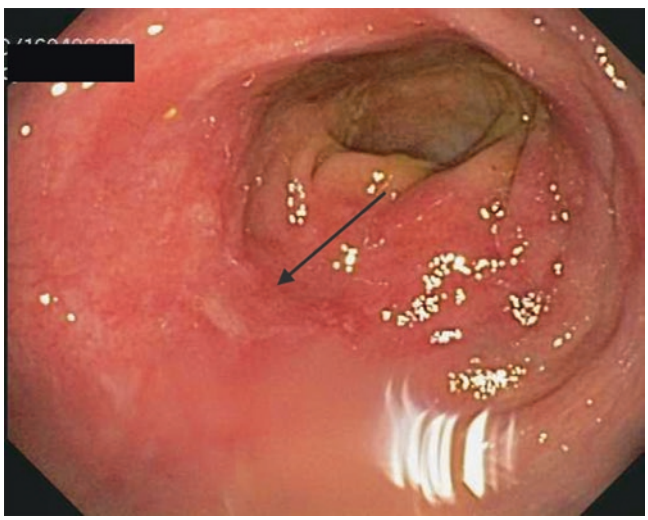

FIGURE 60-15. Solitary rectal ulcer. Inflammation and thickening of the anterior wall of the rectum with early stages of an ulcer.

The workup for both SRUS and CCP includes an in-depth history assessing for straining to defecate, rectal bleeding, and other anal symptoms. Endoscopy with biopsy is essential to make an accurate diagnosis. Treatment of these conditions is challenging and defecography and anal manometry may be useful to guide choices. Interestingly in SRUS, a thickened internal anal sphincter has been reported as a typical finding on endoanal ultrasonography [67].

Treatment is usually directed towards normalizing the defecatory disorder with diet modifications and bowel retraining utilizing pelvic floor physical therapy [68, 69]. Argon plasma coagulation has also been described as a potential treatment modality [70]. In our practice, transanal excision of the lesion is typically not favored as recurrence is particularly high. The Delorme procedure or a proctectomy with a coloanal anastomosis is another option, but again recurrence is high. One specific group of patients that may benefit from surgical intervention are those that have either internal intussusception demonstrated on defecography or overt rectal prolapse. These patients may be offered some form of rectopexy—either suture, mesh, or ventral rectopexy [71–73]. In our experience, anterior dissection may be particularly more challenging is missing the challenging than when dissecting for garden variety rectal prolapse not associated with SRUS or CCP, due to dense anterior fibrosis and inflammation.

In summary, this is a rare but frustrating condition most likely caused by some element of prolapse of the rectum. Conservative treatment is usually the favored approach as surgical intervention that utilizes excision of the lesion seems to have a high recurrence rate.

Conclusion

Surgery should always be considered the treatment of choice for rectal prolapse. The approach (perineal or abdominal) is debatable; however, current trends seem to favor abdominal procedures for all age groups unless the patient is extremely infirmed. Realistic expectations regarding functional outcomes should be reviewed prior to surgical intervention. Fecal incontinence may improve after surgery but full fecal

continence may not be attained. Additional therapy for fecal incontinence may be indicated after surgical healing. Constipation may improve, persist, or worsen after rectal prolapse surgery. Additionally some patients report new problems with constipation after rectal prolapse surgery. Treatment of pelvic floor pathologies should not be compartmentalized. Prolapse or dysfunction of other pelvic floor organs should actively be looked for and surgically addressed in conjunction with appropriate pelvic floor surgeons.

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