Optimizing Treatment for Rectal Prolapse

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Abstract

Rectal prolapse is associated with debilitating symptoms and leads to both functional impairment and anatomic distortion. Symptoms include rectal bulge, mucous drainage, bleeding, incontinence, constipation, tenesmus, as well as discomfort, pressure, and pain. The only cure is surgical. The optimal surgical repair is not yet defined though laparoscopic rectopexy with mesh is emerging as a more durable approach. The chosen approach should be individually tailored, taking into account factors such as presence of pelvic floor defects and coexistence of vaginal prolapse, severe constipation, surgical fitness, and whether the patient has had a previous prolapse procedure. Consideration of a multidisciplinary approach is critical in patients with concomitant vaginal prolapse. Surgeons must weigh their familiarity with each approach and should have in their armamentarium both perineal and abdominal approaches. Previous barriers to abdominal procedures, such as age and comorbidities, are waning as minimally invasive approaches have gained acceptance. Laparoscopic ventral rectopexy is one such approach offering relatively low morbidity, low recurrence rates, and good functional improvement. However, proficiency with this procedure may require advanced training. Robotic rectopexy is another burgeoning approach which facilitates suturing in the pelvis. Successful rectal prolapse surgeries improve function and have low recurrence rates, though it is important to note that correcting the prolapse does not assure functional improvement.

Keywords

- rectal prolapse
- Delorme
- perineal rectosigmoidectomy
- resection rectopexy
- ventral rectopexy

Rectal prolapse, or procidentia, is the protrusion of the full thickness of rectum beyond the anal verge and is evidenced on examination by concentric rings. Occult or internal rectal prolapse occurs when the rectal wall is prolapsed, but not beyond the anus. Both must be distinguished from mucosal prolapse, which is the protrusion of only the rectal or anal mucosa, and which manifests as radially oriented grooves. The definitive etiology of rectal prolapse is not yet clear, but anatomically it is ascribed to the rectum herniated through a deficient pelvic floor. Associated with this are findings such as weakened ligaments of the rectum and presacral fascia, a deep rectovaginal or rectovesical fossa, and a redundant sigmoid colon.¹

Consequences of Rectal Prolapse

Patients' symptoms include a rectal bulge, bleeding, mucous drainage, fecal incontinence, constipation, tenesmus, as well as rectal and pelvic pressure and pain. Not uncommonly, these symptoms lead to social isolation and depression. Mucous drainage occurs early in the condition and over time can develop into frank fecal incontinence, with the prolapsed rectum stenting opening the sphincters and thereby permitting stool leakage. In fact, between 50 and 75% of patients report experiencing incontinence.² Constipation may either lead to rectal prolapse via chronic straining or result from rectal prolapse, as the intussuscepting bowel

creates outlet blockage constipation. Constipation affects between 25 and 50% of patients with prolapse and may be seen in conjunction with colonic dysmotility or dyssynergic defecation.^{2,3}

Rectal prolapse can lead to anatomic distortions. Permanent sphincter damage arises from the continuous stretch and trauma by the prolapsing rectum as well as the chronic stimulation of the rectoanal inhibitory reflex. Pudendal neuropathy has been shown in 50% of patients with prolapse and may contribute to muscular atrophy of the external sphincter.^{4,5}

Patient Populations Affected

While both men and women are affected, women are six times more likely to develop rectal prolapse.⁶ Incidence in the female population peaks in the seventh decade, though approximately 30% of the patients are younger and nulliparous women, many of whom have severe psychiatric disease requiring medications which contribute to severe constipation. Male patients with prolapse often have dysmotility issues, disordered defecation, psychiatric diseases, and developmental delays.^{7,8}

Important Considerations

Factors influencing surgical decision-making include the presence of concomitant pelvic floor defects, colonic dysmotility, comorbidities, a history of abdominal surgery and adhesions, and whether the patient has had previous prolapse operations.

Pelvic Floor Defects

Patients with pelvic floor weakness commonly have multi-compartment prolapse.⁹ It is critical to determine whether patients have genital prolapse in addition to their rectal prolapse so as to avoid committing them to multiple procedures for related disease processes.¹⁰ This can be circumvented by taking a comprehensive history, performing a thorough vaginal and rectal exam, and obtaining additional consultation and testing as appropriate, such as urogynecological examination and urodynamics. Rectal and genital prolapse can be treated concurrently.¹¹ Several groups have demonstrated the safety, efficacy, and durability of abdominal sacrocolpopexy with rectopexy in patients with combined middle and posterior compartment prolapse.^{12,13} While concerns about mesh placement concomitant with bowel resection may arise, at least one series demonstrated no increase in complications when abdominal sacrocolpopexy using synthetic mesh was paired with sigmoid resection and anastomosis.¹⁴

Constipation is often intimately related to rectal prolapse, whether via chronic straining leading to the prolapse or via prolapsed rectum contributing to outlet constipation. A segment of patients will have slow transit constipation, and so in the case of severe constipation, consideration of formal evaluation of colonic transit time is warranted. Sitz marker studies with more than 20% of markers persisting at 5 days

should lead to consideration of colonic resection in addition to the planned prolapse surgery. Though sigmoid resection with rectopexy has been recommended in prolapse patients with constipation, one study found that in patients with preoperatively confirmed pan-colonic dysmotility, resection rectopexy failed to correct their abnormal transit times.¹⁵ For these patients, a subtotal colectomy may be the more efficacious resection.

Rectal Prolapse in the Aged Population

Traditionally, patient age was a critical factor in determining the surgical technique offered, particularly in deciding between abdominal or perineal approach. This division stems from the premise of performing perineal procedures using regional anesthesia, and minimizing exposure of frail patients to the greater complication risks and prolonged recovery associated with abdominal approaches. However, the balance is likely shifting due to data suggesting the safety and enhanced durability of abdominal approaches along with improved recoveries associated with minimally invasive procedures. Fang et al reviewed outcomes including mortality rate of perineal versus laparoscopic and open abdominal approaches for rectal prolapse using data from the American College of Surgeon National Quality Improvement Program (ACS NSQIP) database. This retrospective review found that elderly patients and patients with more comorbidities, as indicated by the ASA score, were more likely to be selected for a perineal approach. Patients 80 years and older were nearly twice as likely to have a perineal approach, whereas patients with an ASA score of 3 or 4 were 1.5 times as likely to undergo a perineal procedure versus those with an ASA score of 1 or 2. The mortality rate in patients undergoing abdominal procedures was lower than that in patients undergoing perineal procedures (0.13 vs. 0.9%), and there were no deaths in patients having laparoscopic abdominal rectal prolapse surgeries, though the overall numbers of death were quite low.¹⁶

Two reviews of laparoscopy in the elderly support the safety and efficacy of this approach. One group reported their outcomes in patients 80 years and older undergoing laparoscopic ventral rectopexy. They demonstrated a 13% complication rate and a 3% recurrence rate with median follow-up of 1.9 years.¹⁷ Another group reviewed their experience with laparoscopic procedures, which included rectopexy with and without mesh and resection. The median patient age was 70 years. The overall complication rate was 28% and their recurrence rate was 3.3% at a median follow-up of 1.8 years.¹⁸ A minimally invasive robotic approach has also been demonstrated to be safe in patients over 75 years, with a statistically similar morbidity rate and length of stay as compared with patients under the age of 75 undergoing the same procedures.¹⁹ Given the findings of lower morbidity than previously thought, coupled with greater durability, surgeons can consider elderly patients as candidates for abdominal approaches, particularly minimally invasive procedures.

Recurrent Rectal Prolapse

The rate of recurrence following rectal prolapse surgery varies, but may range as high as 20 to 30%. Despite this, there

are no guidelines as to the optimal surgical treatment for recurrent prolapse. A recent systematic literature review of surgical techniques and outcomes for recurrent rectal prolapse was unable to develop guidelines due to the heterogeneity of surgical techniques, the short-term follow-up in most studies, and the low quality of evidence.²⁰ One of the studies evaluated in this systematic review was by Steele et al, who evaluated the outcomes of 78 patients undergoing surgery for recurrent prolapse. Fifty-one underwent a perineal procedure and had a mean age of 71.5 years and 27 had an abdominal procedure and had a mean age of 58.5 years. The re-recurrence rate at a mean follow-up of 9 months was 37.3% for the perineal approaches versus 14.8% for the abdominal approaches.²¹ It is not surprising that perineal approaches, which have a higher recurrence rate for primary prolapse, also have a higher re-recurrence rate as compared with abdominal approaches.

In addition to re-recurrence, adequacy of vascular supply should be considered when determining surgical approach. Specifically, redo perineal rectosigmoidectomy can potentially result in a devascularized segment of bowel at risk for leak or stricture, though one recent study has demonstrated the safety of this approach provided that the previous anastomosis is included in the resected portion.²² If the initial procedure was a resection rectopexy, perineal rectosigmoidectomy as the redo operation risks leaving a devascularized segment of the bowel unless the initial anastomosis is resected.²³ Resection rectopexy after perineal rectosigmoidectomy carries similar risks, as the anastomosis depends on an intact marginal artery which can be disrupted with aggressive mobilization.

Patients with recurrent mucosal prolapse following ventral mesh rectopexy can be addressed with a rectal mucosal resection (Delorme) or, in the instance of significant prolapse, by reattaching the mesh to the sacrum or by reinforcing the existing mesh. Occasionally, more extensive rectal dissection and performance of resection and rectopexy may be required. Importantly, one should not attempt to excise the mesh attached to the rectum due to risk of bowel injury including perforation.

Description of Surgical Interventions

The commonly performed procedures for rectal prolapse are below, starting first with the perineal approaches followed by abdominal approaches. Selecting the best procedure for a particular patient will depend not only on the previously mentioned patient factors, but also on the provider's training and familiarity with techniques. Perineal approaches should be used sparingly in patients who can tolerate an abdominal approach given a relatively higher recurrence rate.

Perineal Procedures

Anal Encirclement

Anal encirclement, or the Thiersch procedure, entails reducing the prolapse and narrowing the anal canal with a subcutaneous suture or mesh material. This serves not to eliminate

the prolapse but to provide a mechanical barrier, preventing further descent. It has high recurrence rates, ranging from 33 to 44%, and can lead to severe outlet constipation. Therefore, its use tends to be reserved for patients deemed high risk for anesthetic complications.²⁴ It may also be used in patients with a permanent colostomy and rectal prolapse as a means of reducing protrusion and mucous drainage.

Delorme

Delorme described his eponymous procedure in 1900. It involves prolapsing the rectum, excising the mucosa of the prolapsed segment, plicating the muscular layers, and approximating the remaining mucosa. It has been used in patients with a short segment of prolapse and in patients felt to be high risk for abdominal approaches, such as those with significant intra-abdominal adhesions. While its complication rates are low, recurrence rates are not and range from 16 to 30%.^{25–27}

Perineal Rectosigmoidectomy

Also known as the Altemeier procedure, perineal rectosigmoidectomy consists of excising the full thickness segment of prolapsing rectum and creating a low end-to-end stapled or hand-sewn colorectal or coloanal anastomosis. This technique can worsen fecal incontinence, potentially due to the loss of the rectal reservoir. This procedure therefore can be done in combination with levatorplasty to tighten pelvic floor muscles and improve continence.²⁸ Complication rates are less than 10% but include severe complications such as anastomotic leak; recurrence rates are as high as 20%.²⁹

Abdominal Procedures

Suture Rectopexy

Rectopexy serves to affix the rectum to the sacrum. Rectopexy can be performed via open or minimally invasive techniques. Suturing the rectum to the sacrum aims to prevent intussusception of the redundant bowel; following suture rectopexy, further fixation of the bowel is expected to occur due to resultant surgical adhesions and fibrosis.¹ This technique requires mobilization of the rectum, but the degree varies from limited posterior or anterior to circumferential mobilization. It can include either unilateral or bilateral division of the lateral rectal ligaments. Division of the lateral stalks and extensive mobilization is correlated with lower recurrence but worse constipation, which may be either new onset or an exacerbation of preexisting constipation.^{30–33} It is likely the division of efferent nerves in the lateral ligaments and subsequent autonomic denervation which leads to such functional impairment. To decrease the risk of constipation, unilateral division of the lateral stalks and unilateral pexing of the mesentery should be considered.³⁴ Rectopexy has recurrence rates between 0 and 9%.^{35–37}

Resection Rectopexy

Frykman and Goldberg published on sigmoid resection with rectopexy in 1969.³⁸ Sigmoid resection has been thought to

lower the recurrence rate and decrease constipation, particularly in those reporting constipation preoperatively.^{30,32,39,40} Patients with severe constipation preoperatively should undergo formal assessment for slow transit constipation, as sigmoid resection is inadequate for their constipation and consideration should be given to performing a subtotal colectomy.¹⁵ Conversely, in patients whose main symptom is fecal incontinence, sigmoidectomy is unnecessary.^{34,41} Performance of sigmoid resection varies by region; in the United States, laparoscopic resection rectopexy is currently the most commonly performed procedure for rectal prolapse, whereas laparoscopic ventral rectopexy, without resection, is preferentially performed in European countries.^{42,43}

Anterior and Posterior Mesh Rectopexy

Anterior sling rectopexy, or the Ripstein procedure, entails complete rectal mobilization followed by placement of an anterior mesh sling, affixing the antimesenteric surface and sides of the rectum to the sacral promontory. Its goal is to hold the rectum in the hollow of the sacrum and restore the normal posterior curve of the rectum.⁴⁴ Complication rates range widely, with some series reporting greater than 50% morbidity rates, while recurrence rates vary from 0 to 13%.^{33,45–47} The issue with this procedure is obstruction and narrowing of the rectum, which can worsen or elicit constipation. In one series, 8.8% of patients newly developed constipation; in another series, 31.4% of patients' constipation either remained the same or was worsened with the Ripstein procedure.^{45,46} Modifications to reduce outlet obstruction include fixing mesh at its midpoint to the sacrum, bringing each end anteriorly, and suturing to the rectum. Even with this modification, the Ripstein procedure is waning in usage due to concerns for rectal outlet difficulties.

Posterior mesh rectopexy is modeled after the Wells procedure, which entailed suturing an Ivalon sponge to the presacral fascia, then wrapping the sponge edges three quarters of the way around a fully mobilized rectum and sewing the sponge in place. This sponge has been abandoned due to prohibitively high complication rates including infection. Current iterations involve mobilizing the rectum on the right side, with mobilization carried posteriorly only as needed to facilitate safe suturing of mesh to the sacral promontory. The mesh is then tacked to the rectum on the right side. Recurrence rates are low.³⁹

Laparoscopic Ventral Mesh Rectopexy

Laparoscopic ventral rectopexy was described by D'Hoore in 2004 as an alternative mesh rectopexy technique which spares the autonomic nerves and avoids the postoperative constipation seen in other mesh suspension techniques. It involves opening the rectovaginal septum down to the pelvic floor, then suturing a strip of mesh, usually polypropylene, to the ventral portion of the distal rectum and to the lateral rectum both above and below the pouch of Douglas. The mesh is then affixed to the sacral promontory. The posterior vagina is lifted and tacked to the mesh, thereby elevating the pelvic floor, and the peritoneum is closed over the mesh.⁴⁸

Ventral rectopexy is used not only for full-thickness rectal prolapse, but also for correcting rectoceles and internal rectal prolapse. It can be performed with procedures such as sacrocolpopexy for vaginal prolapse in patients with multi-compartment pelvic floor weakness. By dissecting only the anterior rectum and avoiding posterior rectal dissection and lateral stalk division, autonomic nerve damage is minimized, which greatly reduces the rate of postoperative constipation.⁴⁸

This approach is technically challenging, requiring a complete dissection of the rectovaginal or rectovesical septum followed by suturing the mesh in a confined space. Mackenzie and Dixon retrospectively reviewed their experience with laparoscopic ventral rectopexy to evaluate the learning curve. Operative time improved after 54 cases, though reduced recurrence rates and improved functional outcomes did not occur until after at least 82 cases.⁴⁹ Van Geluwe et al reported on their results after 400 laparoscopic ventral rectopexies. Their morbidity rate was 18%, recurrence rate was 4.6%, and recurrence was found to be mostly due to failure of mesh fixation to sacrum or incomplete prolapse reduction at the time of initial surgery.⁵⁰

Complications unique to ventral rectopexy relate to mesh placement and include mesh erosions, pelvic pain and dyspareunia, rectal stricture, and rectovaginal fistula.^{50–52} Sacral discitis is rare but may occur after any type of pexying procedure where tacks or sutures affix the mesh to the sacral promontory.^{53,54} Draaisma et al reported on two patients who developed discitis at the sacral promontory and cautioned that lower back pain following rectopexy should prompt consideration of this complication. They theorized discitis may arise from bacterial translocation from the bowel to the mesh and thus to the fixation site.⁵⁴

Outcomes following ventral rectopexy were evaluated in a recent meta-analysis of 728 patients in 12 case series, of which 7 case series included procedures with posterior rectal mobilization. Overall complication rates varied from 1.4 to 46.9%, with the most common complications being urinary tract infection or port-site or incisional hernias. An overall decrease of 23.9% in constipation was reported, though seven studies demonstrated new onset constipation at a rate of 14.4%. Fecal incontinence rate decreased in 44.9%. The recurrence rates ranged from 0 to 15.4%, with an overall recurrence rate of 3.4%.⁵²

A retrospective review compared an American cohort of patients undergoing laparoscopic resection rectopexy to a European cohort undergoing laparoscopic ventral rectopexy. Both procedures were associated with a reduction in constipation and fecal incontinence, but laparoscopic resection rectopexy had a significantly higher complication rate (32 vs. 7.5%).⁵⁵ As it stands, laparoscopic ventral rectopexy is currently the gold standard for operative repair of full-thickness rectal prolapse in European countries.⁵⁶

Robotic Rectopexy

Ventral rectopexy is ideally suited for the robotic platform, which can help overcome the challenges of visualization and instrument control inherent to operating deep in the pelvis.

Though not without disadvantages, which include the loss of haptic feedback as well as increased operating time and costs, robotic rectopexy facilitates dissection and mesh fixation. Many feel that suturing the mesh to the anterior rectum, perineal body, and lateral rectal attachments is technically easier when performed robotically versus with conventional laparoscopy and that robotic ventral rectopexy may have a shorter learning curve than laparoscopic ventral rectopexy.⁵⁷

In terms of patient benefit, there is some indication that functional outcomes, i.e., improvement in fecal incontinence, are improved with robotic versus laparoscopic ventral rectopexy.⁵⁸ One systematic review and meta-analysis which compared the outcomes between robotic rectopexy and laparoscopic rectopexy demonstrated similar recurrence, conversion, and reoperation rates. While operative time was found to be significantly longer for robotic rectopexy, the robotic approach was associated with significantly less blood loss, fewer complications, and a shorter length of stay.⁵⁹ These benefits are often evaluated against the higher costs of robotic surgery. Heemskerk et al compared a small series of conventional laparoscopic rectopexy to robotic rectopexy and found that on average, the operating time was 39 minutes longer with the robotic platform and the operating costs \$745 more.⁵⁷ Further comparisons of outcomes and costs with these minimally invasive approaches will be useful in guiding surgical technique.

Conclusion

Rectal prolapse is often a debilitating condition and surgery is necessary for adequate treatment. Deciding what surgical approach to offer is challenging, made more so by the lack of clear guidelines and the evolution in techniques available. The perineal approaches have historically been preferred for aged patients or those with significant comorbid conditions, but abdominal procedures, with their improved durability and minimally invasive techniques, should increasingly be considered for most patients. Though technically challenging, laparoscopic ventral rectopexy is emerging as the procedure with the best functional improvement and acceptable recurrence and complications rates. Whether this is better performed with traditional multiport laparoscopy versus the robotic platform remains to be determined. Prior to treating the prolapse, a thorough evaluation to identify slow transit constipation or other pelvic floor organ prolapse is critical, so that the operative approach and involvement of multidisciplinary teams can be adjusted as necessary. Patients must be counseled that not all disordered function will improve with surgery. While fecal incontinence often improves, it may not totally resolve. Depending on the procedure performed, constipation may improve, remain the same, worsen, or, in some cases, appear de novo. These steps can help ensure patient satisfaction and surgical success.

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