



Alternative Approaches to Traditional Rectal Prolapse Repair in Conjunction with Vaginal Prolapse Surgery

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Abstract

For some patients with both rectal and vaginal prolapse, a perineal approach to combined prolapse repair with rectal fixation would improve prolapse outcomes and be less morbid than an abdominal approach. Utilization of the sacrospinous ligaments and uterosacral ligaments for vaginal apical suspension has been well described with good surgical outcomes and improvement in vaginal prolapse symptoms. We describe using the sacrospinous ligament and uterosacral ligament as a point of fixation for rectal prolapse and vaginal prolapse *via* a transvaginal approach. Two patients with full thickness rectal prolapse and Stage 3 pelvic organ prolapse were evaluated for combined rectal prolapse and pelvic organ prolapse repair. Choice of surgical approach was based on comorbidities, frailty status, prior surgeries, possible hostile abdomen and need to avoid mesh procedures. One patient underwent transvaginal bilateral sacrospinous rectopexy with concurrent sacrospinous colpopexy and one patient underwent transvaginal bilateral uterosacral rectopexy with concurrent uterosacral colpopexy. At 1-year follow-up, both patients who underwent perineal approach with suture rectopexy and transvaginal apical suspension had no complications or symptomatic or anatomical recurrence. Transvaginal sacrospinous rectopexy and colpopexy and transvaginal uterosacral ligament rectopexy and colpopexy are both minimally invasive and technically feasible techniques for the treatment concomitant rectal prolapse and vaginal prolapse.

Keywords: Combined surgery; Pelvic organ prolapse; Rectal prolapse; Transvaginal sacrospinous ligament fixation; Transvaginal uterosacral ligament fixation

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Introduction

A weakened pelvic floor and attenuated structural support can result in the simultaneous prolapse of both the rectum and adjacent pelvic organs. In patients presenting with Rectal Prolapse (RP), the concurrent rate of Pelvic Organ Prolapse (POP) is between 21% and 34% [1,2]. In recent years, the awareness that these two disorders share a common pathophysiology has led to the pioneering of surgical techniques to address multi-compartment prolapse in a single surgery. This multi-disciplinary approach by pelvic reconstructive surgeons and colorectal surgeons has low morbidity and good long-term improvement in patient-reported symptoms [3-5].

Surgical treatment for concurrent prolapse can be performed via the perineal or abdominal route. The abdominal route usually involves a combined ventral rectopexy and sacrocolpopexy. Ventral rectopexy avoids the surgical risks of new-onset constipation and anastomotic leaks after colon resection and has low recurrence rates ranging from 3% to 15% with good long-term results [6,7]. Similarly, sacrocolpopexy is considered the gold standard for vaginal apical prolapse and large series have demonstrated better anatomic outcomes, less recurrent prolapse and less dyspareunia than transvaginal suspension procedures [8,9]. Recently, combined minimally invasive abdominal sacrocolpopexy and ventral rectopexy has become more popular as both surgeries require similar pelvic dissections with the benefits of decreased length of hospitalization, shorter recovery periods, improved cosmetics and increased patient satisfaction [3,4,10-12].

However, abdominal repair for POP and RP is not appropriate for all patients. Patients with previous surgeries, comorbidities or preference to avoid mesh may be better candidates for perineal repair or transvaginal repair [13,14]. The two most common perineal repairs for rectal prolapse are the Delorme and the Altemeier procedures, which involve mucosal or full thickness resection. These procedures are less invasive and cause less postoperative pain than an abdominal approach,

but have higher risks of anastomotic leaks, infection, bleeding, fecal incontinence, fecal impaction and stricture [15-19]. Perineal repairs for rectal prolapse are often performed with a combined transvaginal apical suspension procedure in patients with concurrent POP and RP.

For some patients, the perineal approach may be less morbid than the abdominal approach, but the risks of anastomotic leaks or infection from colonic resection outweigh the benefits. A perineal approach with rectal fixation without resection for rectal prolapse would be ideal for these patients. Transvaginal sacrospinous rectopexy with mesh for the treatment of rectal prolapse has been previously described with low complication rates and good anatomical and functional outcomes [20].

Here, we describe a combined approach to treat POP and RP using the sacrospinous ligament or uterosacral ligament as a point of fixation for rectal prolapse and vaginal prolapse via a suture-based transvaginal approach. Utilization of the sacrospinous ligaments and uterosacral ligaments for vaginal apical suspension has been well described with good surgical outcomes and improvement in vaginal prolapse, as both the sacrospinous ligament and uterosacral ligament are reliably strong structures and easily accessed transvaginally [21,22]. In our novel approach, RP and POP can be concomitantly treated by attaching the same suspension sutures to both the rectum and vaginal apex.

Materials and Methods

Following Institutional Review Board (IRB) approval, two patients with full thickness rectal prolapse and Stage 3 pelvic organ prolapse were enrolled into our pilot study. After a detailed explanation of the planned operative approach, informed consent was obtained. Choice of the perineal and vaginal surgical approach was based on comorbidities, prior surgeries, possible hostile abdomen and need to avoid mesh procedures. The first patient is a 64 year old gravida 2 para 1 with Stage 3 uterovaginal prolapse, Stage 3 anterior vaginal wall prolapse, Stage 2 posterior vaginal wall prolapse and full thickness rectal prolapse. As the patient had a history of multiple abdominal procedures and poor cardiovascular health, a perineal rectopexy and transvaginal colpopexy was recommended. The patient desired hysterectomy at the time of her procedure, which would grant intraperitoneal access to the bilateral uterosacral ligaments. Thus, she was counseled for a transvaginal uterosacral ligament rectopexy and uterosacral ligament colpopexy. The second patient is a 71 year old gravid 2 para 2 with Stage 3 vaginal vault prolapse, Stage 3 anterior wall prolapse, Stage 3 posterior vaginal wall prolapse and predominantly anterior full thickness rectal prolapse. This patient also had a history of multiple abdominal procedures and, thus a perineal rectopexy and transvaginal colpopexy was also recommended. As the patient had a prior hysterectomy, an extraperitoneal sacrospinous ligament fixation was planned and she was counseled for a transvaginal sacrospinous ligament rectopexy and sacrospinous ligament colpopexy.

Native-tissue transvaginal approach to pelvic organ prolapse

Typically, an uterosacral ligament suspension or a sacrospinous ligament fixation is performed to treat vaginal prolapse. Adequate knowledge of the anatomy of the ischial spines, coccygeous muscles, sacrospinous ligament, as well as the pararectal anatomy is crucial. The Sacrospinous Ligaments (SSL) extends from the ischial spines on each side to the sacrum along the coccygeous muscle. The SSL is identified by palpating the ischial spine and tracing the flat triangular

thickening medial and posterior to the sacrum. It is a reliably strong structure, easily accessible and serves as an excellent fixation point. SSL Suspension (SSLS) is generally performed unilaterally and most surgeons prefer the right side as the bowel enters the pelvis on the left side [23]. Bilateral SSLS is also commonly performed, but outcomes after bilateral technique are similar to unilateral SSLS [24,25]. Transvaginal sacrospinous fixation for vaginal vault prolapse has been shown to offer good long-term anatomical results with excellent vault suspension and high patient satisfaction [26,27].

An additional popular native-tissue transvaginal approach for the management of apical prolapse is bilateral uterosacral ligament colpopexy. The uterosacral-cardinal ligament complex is made of smooth muscle, connective tissue and nerves and is thought to provide support to the pelvic organs. Uterosacral ligament colpopexy is an intraperitoneal procedure and identification of the uterosacral ligaments is mandatory to perform the suspension. The uterosacral ligaments originate from the S1 to S4 vertebrae to insert near the cervix and the intermediate portion of this ligament can serve as a durable fixation point. Clinical experiences show that prolapse repair with USL suspension is safe and effective [27,28]. Uterosacral ligament suspension is typically the apical suspension of choice if performed with a concurrent hysterectomy as they are easily identified inserting onto the cervix during colpotomy [28]. An intraperitoneal uterosacral ligament suspension can also be performed in patients with vaginal vault prolapse if the vaginal apex is very narrow and cannot reach the sacrospinous ligament without significant tension or a suture bridge.

Surgical technique

Transvaginal uterosacral ligament rectopexy uterosacral ligament colpopexy:

1. The vaginal apex is grasped with two Allis clamps and the lateral aspects of the vaginal apex are marked with two sutures to facilitate reconstruction.
2. The apex is incised with a scalpel and the vaginal epithelium is dissected off the peritoneum. The peritoneum is then excised to obtain intraperitoneal access.
3. If performing a vaginal hysterectomy, the uterosacral ligaments are identified at their insertion on the uterus, transected bilaterally and then tagged to help with identification of intraperitoneal uterosacral ligaments once the uterus has been removed.
4. Bowel is packed out of the operative field with several moist tail sponges. A wide Deaver retractor is used to elevate the moist packs out of the operative field and allows identification of the uterosacral ligaments (USLs).
5. The ischial spines are palpated transperitoneally. The remnants of the USLs are found posterior and medial to the ischial spine. The ureters can be identified by direct visualization of ureteral peristalsis or by digital palpation at the level of the ischial spines ~2 cm ventrally from the USL.
6. Gentle traction with Allis clamps on the caudal part of the USL can also facilitate identification and palpation of the USL.
7. Two to three delayed absorbable sutures are passed in the USL at the level of the ischial spine, where the ureter tends to diverge from the USL. USL fixation is performed from ventrally to dorsally or laterally to medially to reduce the risk of inadvertent ureteral entrapment.

8. Each suture is marked with a different instrument to allow successive correct positioning, and the moist sponges are removed.

9. The same procedure is performed on the contralateral side.

10. Diagnostic cystoscopy is then performed to assess bilateral ureteral patency with tension on the sutures.

11. The posterior vaginal wall is infiltrated in the midline with a mixture of 1% lidocaine and epinephrine diluted 1:200,000. A longitudinal incision is made from the apex inferiorly in the posterior vaginal wall and the vaginal epithelium is then separated from the underlying muscularis.

12. A finger is then placed in the rectum and the dentate line is identified. The redundant rectal mucosa is then reduced.

13. These sutures are then brought through the anterolateral surface of the rectum with a free needle at a level of approximately 1 cm to 2 cm proximal to the dentate line.

14. After anchoring the sutures to the uterosacral ligaments and the anterior surface of the rectum, the sutures are pulled taught without tying to ensure the appropriate amount of tension on the rectum and to ensure that the rectal prolapse is reduced.

15. One arm of each suture is passed through the anterior muscularis surrounding the vaginal apex and the other through the posterior endopelvic fascia in a serial fashion. The sutures thereby cross the width of the vaginal apex.

16. Transvaginal uterosacral ligament rectopexy and uterosacral ligament colpopexy is performed on the contralateral side in order to maintain anatomical position of the rectum.

17. Traction on the free end of the sutures draws the anterior rectum and vaginal apex directly onto the uterosacral ligament and the sutures are tied by pulley stitches.

18. All sutures are then tied, re-approximating the anterior and posterior vaginal muscularis, closing any potential enterocele defect, and elevating the vaginal apex and rectum toward the sacrum.

Transvaginal sacrospinous ligament rectopexy and sacrospinous ligament colpopexy:

1. A pelvic examination is first performed to identify the sacrospinous ligaments by palpating the ischial spine and tracing posteriorly and medially to the sacrum.

2. The apex of the vagina is grasped with two Allis clamps and then reduced to the sacrospinous ligaments. The intended apex is then marked with two sutures at the site where it will attach to both the right and left SSLs.

3. The SSL can be accessed via a posterior vaginal or anterior vaginal approach. For concurrent rectal prolapse surgery when the sacrospinous ligament will be the point of fixation, the posterior vaginal dissection works most effectively.

4. The posterior vaginal wall is infiltrated in the midline with a mixture of 1% lidocaine and epinephrine diluted 1:200,000. A longitudinal incision is made in the posterior vaginal wall and the vaginal epithelium is then separated from the underlying muscularis. The dissection is continued to the level of the ischial spine exposing the pre-rectal fascia.

5. The perirectal space is opened by mobilizing the rectum

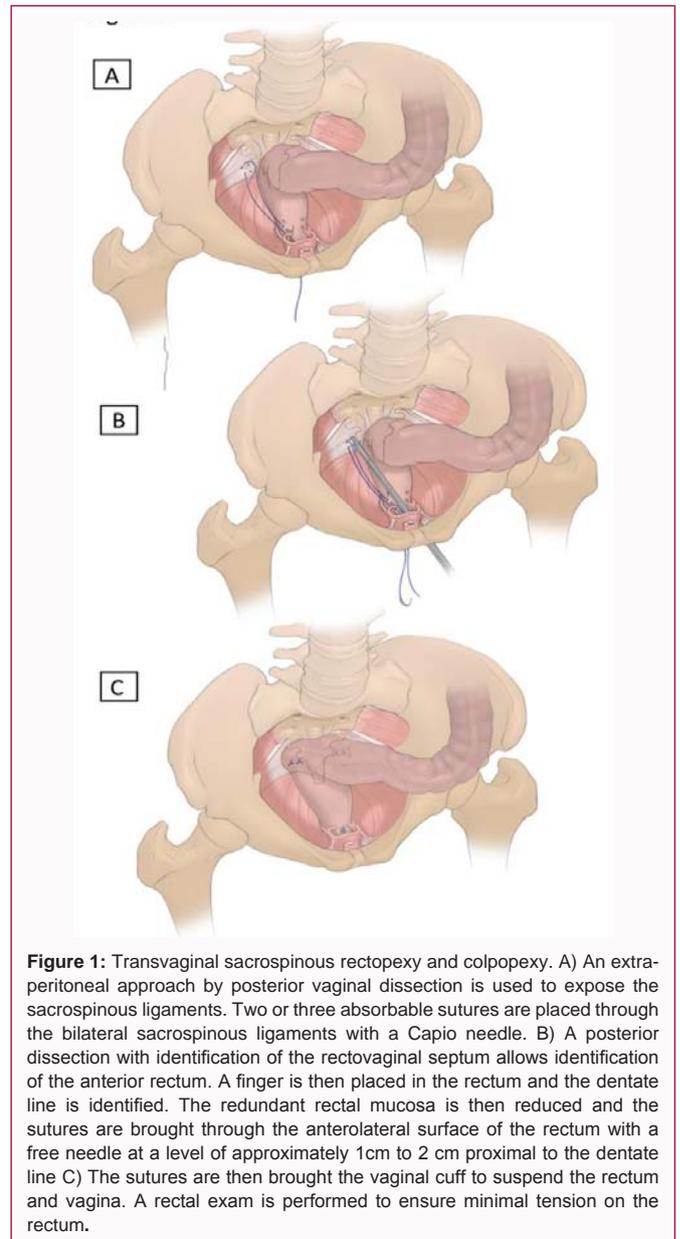


Figure 1: Transvaginal sacrospinous rectopexy and colpopexy. A) An extra-peritoneal approach by posterior vaginal dissection is used to expose the sacrospinous ligaments. Two or three absorbable sutures are placed through the bilateral sacrospinous ligaments with a Capiro needle. B) A posterior dissection with identification of the rectovaginal septum allows identification of the anterior rectum. A finger is then placed in the rectum and the dentate line is identified. The redundant rectal mucosa is then reduced and the sutures are brought through the anterolateral surface of the rectum with a free needle at a level of approximately 1cm to 2 cm proximal to the dentate line C) The sutures are then brought the vaginal cuff to suspend the rectum and vagina. A rectal exam is performed to ensure minimal tension on the rectum.

medially and then bluntly perforating the rectal pillar.

6. The ischial spine is palpated and three Breisky-Navratil retractors are inserted to provide adequate exposure, one to displace the bladder and peritoneum anteriorly, one to displace the rectum medially and a third on the ischial spine to protect the pudendal neurovascular bundle and optimize visibility of the coccygeus muscle– sacrospinous ligament complex.

7. With the ligament clearly visible, two to three delayed absorbable sutures are placed through the ligament approximately one and one-half finger-breadths medial to the ischial spine. Sutures can be positioned with a needle holder or a suturing device (e.g., Capiro device, Miya hook, Deschamps ligature carrier and nerve hook, laparoscopic suturing devices) (Figure 1A).

8. A finger is then placed in the rectum and the dentate line is identified. The redundant rectal mucosa is then reduced.

9. These sutures are then brought through the anterolateral

surface of the rectum with a free needle at a level of approximately 1 cm to 2 cm proximal to the dentate line (Figure 1B).

10. After anchoring the sutures to the ligament complex and the anterior surface of the rectum, the sutures are pulled taught without tying to ensure the appropriate amount of tension on the rectum and to ensure that the rectal prolapse is reduced.

11. Each of the sutures is then placed through the muscularis on the undersurface of the posterior vaginal epithelium and then brought through the apex of the vagina using a free needle.

12. Transvaginal sacrospinous ligament rectopexy and sacrospinous ligament colpopexy is performed on the contralateral side in order to maintain anatomical position of the rectum.

13. Traction on the free end of the sutures draws the anterior rectum and vaginal apex directly onto the sacrospinous ligament and the sutures are tied by pulley stitches (Figure 1C).

14. The posterior wall of the vagina is then closed taking care not to entrap the sacrospinous ligament-anterior rectum sutures.

15. Diagnostic cystoscopy is performed at the end of the procedure to assess bilateral ureteral patency.

Results

Both patients were counseled for perineal procedures given their history of multiple abdominal surgeries. Both patients underwent simultaneous Delorme procedures due to more extensive rectal prolapse. Patient 1 underwent sacrospinous rectopexy in addition to mucosal resection for rectal prolapse with a large anterior component. Patient 2 underwent sacrospinous rectopexy in addition to mucosal resection for a large rectal prolapse (6 cm) and poor cardiovascular health that prohibited an abdominal procedure. The operative time was 215 minutes longer in the patient who underwent a transvaginal hysterectomy and cystocele repair. Mean estimated blood loss was 75 cc. Both patients stayed one night in the hospital and were discharged on post-operative day 1. There were no major intraoperative or immediate post-operative complications. Both patients had follow-up examinations at least 1 year after surgery and neither patient had symptomatic or anatomical recurrence (Table 1).

Discussion

In this paper, we describe two techniques of rectal and vaginal apical fixation using the perineal approach for combined rectal and pelvic organ prolapse. Vaginal prolapse repair using the uterosacral ligaments and sacrospinous ligaments is both safe and durable. While the sacral promontory as a point of fixation has been successful for transabdominal rectopexy, utilization of the sacrospinous ligament or uterosacral ligaments as the point of fixation allows a perineal approach to rectal prolapse repair. Additionally, this approach uses the same dissection to repair multi-organ prolapse.

Gurland et al. [20] previously described transvaginal sacrospinous rectopexy for seven patients with rectal prolapse. They aimed to avoid abdominal surgery in elderly patients and improve long-term results of the perineal approach for the repair of rectal prolapse. Initial results have been encouraging with good suspension in all but one patient who had recurrence at 18 weeks.

Preliminary data from this feasibility study shows that perineal suture rectopexy using the sacrospinous or uterosacral ligaments could provide excellent suspension and long-term durability.

Transvaginal rectopexy and colpopexy could be a good option to repair combined rectal prolapse and pelvic organ prolapse in elderly women or patients who should avoid abdominal surgery. Long-term follow-up and prospective randomized studies are needed to better assess symptomatic and anatomic recurrence and establish durability in comparison to other available procedures for combined rectal and pelvic organ prolapse.

Combined multidisciplinary pelvic floor clinics offer the opportunity for the colorectal surgeon and urogynecologist to examine the patient jointly. Several studies have suggested that a multidisciplinary approach to POP and RP may improve surgical outcomes and patient symptoms [29]. The choice of surgical approach can then be tailored to each patient and can lead to more pragmatic approach of correcting both vaginal and rectal prolapse at the same time. Transvaginal sacrospinous rectopexy and colpopexy and transvaginal uterosacral ligament rectopexy and colpopexy are both minimally invasive and technically feasible techniques for the treatment concomitant rectal prolapse and vaginal prolapse.

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