

# Abdominal techniques for surgical management of vaginal vault prolapse

Indications, techniques, and evidence-based rationale

**A** range of clinical conditions can suggest an abdominal approach for vaginal vault prolapse procedures. These include, but are not limited to:

- prior unsuccessful vaginal attempts
- obligate need for adnexal access
- markedly foreshortened vagina
- pelvic bony architectural limitations
- high risk for surgical failure (eg, athleticism, obesity, chronic obstructive pulmonary disease, congenital connective tissue disorder)
- desire for uterine preservation

In Part 1 (November 2005) of this 2-part article, we reviewed the most widely used and the newest vaginal techniques. Part 2 focuses on the abdominal approach, and compares vaginal and abdominal approaches.

## ■ High uterosacral ligament suspension

Surgical technique for this procedure for mild to moderate vaginal vault prolapse (stage I or II), using a vaginal approach, was described in Part 1, in the November issue of OBG MANAGEMENT. Abdominal repair involves the same concepts; like the vaginal approach, it is applicable only to the patient with mild to moderate vault prolapse. It will be less successful if it is performed to address complete vault prolapse.

## Technique

Identify and tag the remnants of the uterosacral ligaments at the level of the ischial spines. Once the ureters are identified and isolated, address the enterocele by obliterating the cul-de-sac via Halban's culdoplasty or abdominal McCall's culdoplasty.

Open the peritoneum over the vaginal apex and trim it back to the level of the endopelvic fascia of the vaginal wall. After excising the redundant peritoneum of the vaginal apex, identify and reapproximate the pubocervical fascia of the anterior vaginal wall and the rectovaginal fascia of the posterior vaginal wall using interrupted or running nonabsorbable suture.

Then use nonabsorbable sutures to suspend each corner of the prolapsed vagina from its respective ipsilateral uterosacral ligament.

## ■ Abdominal sacral colpopexy

Abdominal sacral colpopexy was first popularized by Addison and Timmons in the 1980s, and is the abdominal standard of apical prolapse repair due to its long-term durability.

Abdominal sacral colpopexy can be performed with or without uterine extirpation. When a hysterectomy is performed concomitantly, some surgeons prefer a supracervical approach, provided there is

**William Irvin, MD**  
Associate Professor  
Division of Gynecologic Oncology  
University of Virginia  
Health System  
Charlottesville, Va

**Kathie Hullfish, MD**  
Director, Division of Reconstructive  
Pelvic Surgery and Urogynecology  
University of Virginia  
Health System  
Charlottesville, Va

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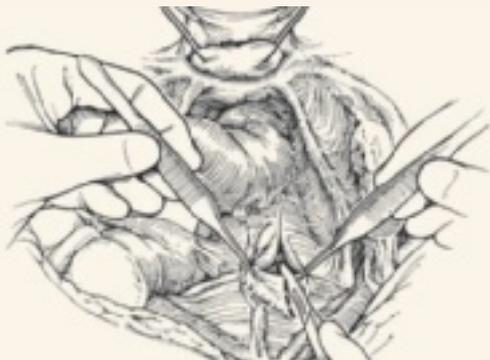
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**FIGURE 1**

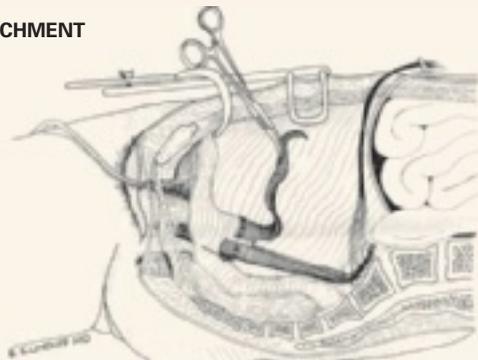
### Abdominal sacral colpoplexy technique

**INCISION**



A longitudinal incision in the peritoneum overlying the sacral promontory is extended 6 cm into the cul-de-sac, opening the retrorectal space.

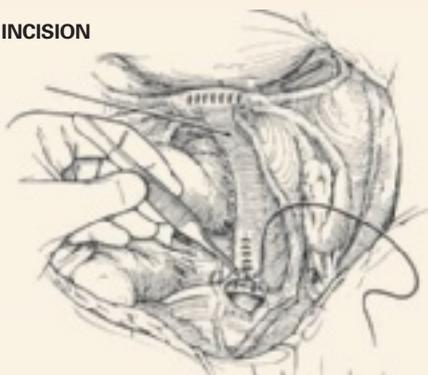
**MESH ATTACHMENT**



The mesh is attached through the fibromuscular thickness of the anterior vaginal wall, excluding the mucosa, with multiple interrupted sutures. Though the diagram suggests the use of 2 separate pieces of mesh (one for the anterior and one for the posterior walls), doubling a single piece of mesh and “fishmouthing” the end to be attached to the vagina will accomplish the same goal.

Reprinted from Addison WA, Cundiff GW, Bump RC, Harris RL. Sacral colpoplexy is the preferred treatment for vaginal vault prolapse. *J Gynecol Tech.* 1996;2:69-74. ©1996, with permission from Elsevier.

**CLOSING THE INCISION**



The 6-cm incision is closed over the top of the mesh, retroperitonealizing the prosthesis.

no history of cervical dysplasia, because, theoretically, the cervical stump serves as a firm and substantial point of fixation for the synthetic mesh that will be used to perform the repair. This in turn may diminish the likelihood of postoperative mesh erosion.

**Technique**

Reflect the sigmoid colon as far as possible into the left lateral pelvis to expose the sacral promontory. If it has not already been done, free all adhesions between the colon and pelvic peritoneum to fully mobilize the colon and permit its maximal retraction out of the pelvic field prior to making the peritoneal incision.

Also make it a point to identify all structures at risk during this portion of the procedure—namely, the common iliac vessels, ureters, and middle sacral artery and vein. The left common iliac vein is medial to the left common iliac artery and is particularly susceptible to injury during this phase of the procedure.

**Make a longitudinal incision** in the peritoneum overlying the sacral promontory and extend it approximately 6 cm from the promontory dorsally into the cul-de-sac, opening the retrorectal space (**FIGURE 1, TOP**). Using a fine tonsil forceps and cautery, very gently dissect the retroareolar filmy tissue overlying the anterior longitudinal ligament away from S1 in thin layers until the white periosteum of the anterior longitudinal ligament overlying S1 is clearly exposed. It now becomes very easy to visualize the course of the middle sacral artery and vein. With these vessels under direct visualization, place 2 permanent #0 sutures through the periosteum of S1.

**Do not attempt** to place these sutures deeper in the presacral space than the S1 vertebral body, or life-threatening and uncontrollable bleeding may result.

If there is no uterus, insert a probe such as an end-to-end anastomotic sizer or handheld Harrington retractor into the vagina and extend it, elongating and elevating the vaginal cylinder. It now becomes much easier to identify the interface

between the bladder and vagina prior to making the peritoneal incision.

If the interface remains indistinct, instill 150 cc of saline into the bladder to delineate its boundaries. Then elevate and incise the vesicouterine peritoneum overlying the junction between the bladder and vaginal apex; this provides access to the vesicocervical space. Dissect the bladder off the anterior vaginal wall in a caudal direction until the pubocervical fascia can be identified. Do not dissect away the peritoneum over the posterior vaginal wall, but leave it intact.

### Reconstructive materials

Although many different materials have been described, none have undergone rigorous comparisons. In our institution, we use soft polypropylene (*Surgipro*; US Surgical, Norwalk, Conn).

Fold a piece of 5-inch mesh over onto itself and suture the layers together to create a double-thickness configuration. Then “fishmouth” the caudal end of this mesh prosthesis, producing both an anterior and posterior leaf. With the obturator still within the vaginal cylinder stretching the vaginal apex, secure the posterior leaf of the mesh to the posterior vaginal wall with 3 to 5 nonabsorbable #0 sutures.

**Suture placement.** Thread each suture initially through the posterior leaf of the mesh, placed deeply through the fibromuscular thickness of the posterior vaginal wall, then bring it back out through the mesh at the same point. Place the sutures in a transverse line 1 to 2 cm apart and 3 to 4 cm distal to the vaginal apex.

Once all sutures have been placed, tie each of them, thereby securing the posterior leaf of the mesh to the posterior vaginal wall. Now perform a “mirror” procedure to secure the anterior leaf of the mesh prosthesis to the anterior vaginal wall. Then firmly attach the mesh prosthesis to the vaginal apex using several interrupted, permanent sutures.

At this point, the sutures previously placed through the periosteum of the

sacral promontory are threaded through the apex of the mesh prosthesis at a point that will allow the vagina to rest comfortably within the pelvis, without undue tension or traction once the sutures are tied into place (**FIGURE 1, MIDDLE**).

Trim any excess mesh, and close the 6-cm longitudinal peritoneal incision previously created in the cul-de-sac. Close the incision over the top of the mesh, retroperitonealizing the mesh prosthesis (**FIGURE 1, BOTTOM**).

### Paravaginal defect repair

The bladder base is intimately associated with the anterior vaginal wall via a triangular sheet of pubocervical fascia attached to and extending from the arcus tendineus fascia pelvis bilaterally. When the apex of the vagina prolapses through the introitus, as in total vault prolapse, the base of the bladder is torn free from these fascial attachments in the pelvis and herniates through the introitus along with the vaginal apex. By definition, a bilateral paravaginal defect will result. Thus, surgical repair of total vaginal vault prolapse almost invariably requires paravaginal defect repair as well.

The goal of paravaginal defect repair is to reattach, bilaterally, the anterolateral vaginal sulcus and its overlying endopelvic fascia to the pubococcygeus and obturator internus muscles and fascia at the level of the arcus tendineus fascia pelvis.

### Technique

Enter and gently develop the retropubic space of Retzius, taking care not to disrupt the myriad venous anastomotic networks of the plexus of Santorini, located on and around the bladder. Bluntly mobilize the bladder bilaterally, exposing the lateral retropubic spaces, the pubococcygeus and obturator internus muscles, and the obturator neurovascular bundles. Within each retropubic space, palpate the ischial spine. Then visualize the arcus, seen as a white ligamentous band, as it courses from the ischial

### FAST TRACK

**Surgical repair of total vaginal vault prolapse almost always requires paravaginal defect repair, as well**

## Why correct all defects at once?

When a patient has complete vault prolapse, she typically has defects in all 3 levels of pelvic support, and thus may need to undergo several different procedures to correct all anatomic defects and restore function.

In other words, vaginal vault prolapse rarely presents as an isolated defect. It more commonly occurs in conjunction with a cystocele, rectocele, enterocele, or some combination of these.<sup>1</sup> Richter reported that 72% of patients with vaginal vault prolapse had a combination of other pelvic floor defects as well.<sup>2</sup>

If all vaginal support defects are repaired at the time of sacral colpopexy, recurrent vault prolapse is rare. Failures can be minimized by suturing the suspensory mesh to the posterior vagina and anterior vaginal apex over as extended an area as possible. Also test the sutures once they are placed within the periosteum of the sacral promontory to ensure they will not pull free.

### FAST TRACK

**If all vaginal support defects are repaired at the time of sacral colpopexy, recurrent vault prolapse is rare**

spine caudally toward the ipsilateral posterior pubic symphysis. A lateral paravaginal defect representing avulsion of the vagina off the arcus tendineus fascia pelvis, or of the arcus tendineus fascia pelvis off the obturator internus muscle, can now be visualized.

While gently reflecting the bladder medially with a wide ribbon, insert a few fingers of the nondominant hand into the vagina and elevate the ipsilateral anterolateral vaginal sulcus. Then place a suture through the fibromuscular thickness of the lateral vaginal apex, just above the uplifting fingers in the vagina, and then slightly cephalad into the arcus tendineus fascia pelvis or obturator internus fascia on the pelvic sidewall, at a point 1 to 2 cm distal to the ischial spine. Place 3 to 5 additional sutures in a similar fashion at 1-cm intervals. The most distal suture should be placed as close as possible to the pubic ramus into the pubourethral ligament. If necessary, repeat the procedure on the contralateral side. Then tie all sutures into place, thereby completing the repair.

### ■ Plan on occult incontinence

Total vaginal vault prolapse is commonly associated with some degree of urethral

kinking, with subsequent outflow tract obstruction. As a result, most patients with complete vault prolapse do not complain of incontinence at the initial presentation. However, once the anatomic axis of the vagina is restored and the bladder is replaced within the pelvis with subsequent straightening of the urethra, occult incontinence often is uncovered. Although the patient may have a wonderful anatomic repair of severe vault prolapse at the completion of the surgical procedure, she will not be satisfied if she suddenly finds herself floridly incontinent.

**Consider formal multichannel cystometrics** prior to surgery in all women undergoing repair of total vault prolapse. If genuine stress urinary incontinence is present when the prolapse is reduced, an anti-incontinence procedure can be scheduled at the same time as the surgical repair. A Burch procedure can be performed for type IIA or IIB genuine stress incontinence, or a pubovaginal sling procedure can be performed for type III stress incontinence.

### Posterior colporrhaphy/perineorrhaphy

These procedures are now performed to treat the remaining rectocele and perineal defect, when present.

### ■ Vaginal vs abdominal route

Somewhat surprisingly, the abdominal route appears to produce better long-term results. In a prospective, randomized controlled trial comparing both routes for the repair of total vault prolapse, Benson et al<sup>9</sup> found that, after 5 years of follow-up, women managed vaginally had a 6-fold increased incidence of recurrent vault prolapse, a 3-fold increased incidence of recurrent cystocele, and twice the reoperation rate, compared with women whose initial repair was abdominal.

In the study, 48 women with total vault prolapse underwent vaginal bilateral sacrospinous fixation and paravaginal defect repair, and 40 underwent abdomi-

nal sacral colpopexy and paravaginal defect repair. Although the vaginal approach was associated with a shorter operative time and decreased hospital stay in the short term, it necessitated longer postoperative catheter use and was associated with more urinary tract infections and postoperative incontinence and a higher overall failure rate.

Sze and colleagues<sup>4</sup> addressed a similar question in retrospective fashion, reviewing the medical records of 117 women surgically treated for total vault prolapse. Sixty-one women underwent vaginal sacrospinous ligament fixation and Raz urethropexy, while 56 underwent abdominal sacral colpopexy and Burch urethropexy. After a mean follow-up of 24 months, 33% of the women managed vaginally developed recurrent pelvic organ prolapse, compared with only 19% of the women managed abdominally. In addition, 26% of the women managed vaginally had recurrent urinary incontinence, compared with only 13% of the women managed abdominally.

A separate randomized, prospective study by Maher et al<sup>5</sup> compared abdominal sacral colpopexy (n = 47) and vaginal sacrospinous ligament fixation (n = 48) for stage II to IV vault prolapse. After a mean follow-up of 2 years, subjective and objective success rates did not differ significantly between the 2 routes.

### Why is the abdominal route more durable?

Any number of reasons may apply:

- The traditional surgical procedure for vaginal management of total vault prolapse—sacrospinous ligament fixation—distorts the axis of the vagina.
- Native tissues are not as strong as synthetic materials. In postmenopausal women, a repair in which the thin, atrophic vaginal apex is secured to the sacrospinous ligament will not have the same durability as a repair involving mesh.
- In vaginal paravaginal repair, the extensive periurethral dissection required can

damage fine branches of the pudendal nerve that innervate and control the urethral sphincter. Such extensive dissection is not required for paravaginal repair from the abdominal approach.

- In the vaginal approach, it can be difficult to gain adequate exposure high in the retroperitoneum to reattach the endopelvic fascia of the vaginal apex to the arcus at its origin just distal to the ischial spine.

### ■ The long view

The surgical options described in this article have varying degrees of risk and benefit. Multicenter, prospective surgical trials are needed to clarify these risks and benefits and provide physicians and their patients with reliable information. Ultimately, pursuit of a surgical “cure” will be supplanted by sustainable forms of disease prevention. Until then, decisions about prolapse surgery are best left to the judgment of the surgeon and the desires of his or her patient. ■

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#### FAST TRACK

**Extensive dissection is not required for paravaginal repair from the abdominal approach**