

## MASTER CLASS

## Revisiting Anterior Colporrhaphy



BY CHARLES E. MILLER, M.D.

According to Dr. Sangeeta Mahajan, any descent of the anterior wall of the vagina or base of the bladder, whether provoked or without straining, can be considered clinically an anterior vaginal wall defect. However, the International Continence

Society uses a more precise definition: An anterior vaginal wall defect exists when the urethrovesical junction or any other part of the anterior vaginal wall is less than 3 cm from the hymenal ring.

It is now recognized that anterior vaginal wall prolapse occurs as a result of a specific defect in the vagina's support structure. Epidemiologically, aging, parity, obesity, cigarette smoking, chronic lung disease, congenital defects, white ancestry, and prior hysterectomy or prolapse surgery have been identified as risk factors associated with pelvic organ prolapse. Ultimately, management of anterior wall defects, which may be conservative or surgical, is indicated for the fol-

lowing reasons: discomfort, urinary retention, or genuine stress urinary incontinence.

Although retrospective case series, with a minimum of 1-year follow-up, by R. Porges, S.L. Stanton, and Walter and C. Maher, have documented success rates following anterior colporrhaphy for the treatment of anterior vaginal wall defects, in the range of 80%-100%; prospective studies by P.K. Sand and A.M. Weber demonstrate rates of success at 37%-57%.

Given the obvious challenge in providing success to our patient suffering with an anterior vaginal support defect with resulting prolapse, it is important to review the anatomy, perform proper evaluation, and provide appropriate surgical treatment, including use of graft materials.

In this edition of the Master Class in Gynecologic Surgery, I have once again called upon Dr. Dee E. Fenner, the Harold A. Furlong Professor of Women's Health and director of gynecology at the University of Michigan, Ann Arbor. This time Dr. Fenner will revisit anterior colporrhaphy for the treatment of anterior vaginal wall prolapse. Dr. Fenner provided her insight on the technique of posterior colporrhaphy and perineorrhaphy, that is, transvaginal rectocele repair, in the last installment of OB.GYN. NEWS's Master Class in Gynecologic Surgery. Her current research findings include mechanisms of vaginal wall support failure. Dr. Fenner is a nationally recognized expert and lecturer on urogynecology. The Master Class in Gynecologic Surgery once again owes a debt of gratitude to Dr. Fenner. ■

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## Treating Anterior Vaginal Wall Prolapse

The anterior vaginal wall is the most common site of initial pelvic organ prolapse. It is estimated that 80% of surgical repairs for vaginal wall prolapse involve the anterior compartment. It is also the most frequent site of operative failure. Reported rates of operative failure have run as high as 40%—much higher than rates of failure after posterior wall repairs.

There are several possible reasons the anterior vaginal wall may be more susceptible to prolapse and more difficult to repair. It could be that the anterior wall is not as well supported by the levator plate that counters the effects of gravity and abdominal pressure. Normally the anterior wall rests horizontally on the posterior

wall, and the posterior wall rests on the levator plate. When levator muscles weaken and increasing force is placed on the connective tissue supports, the anterior wall may be the first compartment to fall. It is also possible that the attachments of the anterior compartment to the pelvic sidewall or to the apex are weaker, or that the anterior wall itself is more elastic or less dense, or perhaps it is more susceptible to damage during childbirth or weakening with aging. For most women, anterior vaginal wall prolapse is probably the result of a combination of these factors.

Management of anterior wall prolapse is consequently a significant challenge—one that has led surgeons to use various graft materials to reduce the rate of failure of transvaginal repair and subsequent prolapse recurrence. Several studies have shown improvements in short-term recurrence rates, but long-term durability and safety of mesh-reinforced repair is unclear. We need a more complete assess-

ment of the anatomic and symptomatic efficacy of graft use in transvaginal repair.

The traditional anterior colporrhaphy with attention to apical suspension remains the preferred method for primary repairs. Apical attachment can be accomplished through a sacrocolpopexy, uterosacral ligament suspension, or sacrospinous ligament suspension. Sacrocolpopexy provides both apical and midline support for the anterior wall. For many surgeons, including myself, a sacrocolpopexy is the procedure of choice for women with a cystocele and apical descent.



BY DEE E. FENNER, M.D.

## Anatomy and Evaluation

Understanding pelvic floor anatomy—and the trapezoidal anatomy of the anterior

or vaginal wall—is critical to understanding the various types of cystocele and their repair. The trapezoidal plane of the anterior wall results from the ventral and more medial attachments near the pubic symphysis and the dorsal and more lateral attachments near the ischial spine. The wall is suspended on both sides to the parietal fascia overlying the levator ani muscles at the arcus tendineus fascia pelvis (ATFP).

The type of cystocele is defined by where there is a break in the fascial attachments to the pelvic sidewall. A loss of lateral attachment causes what we know as a paravaginal defect, or displacement cystocele. The goal of the paravaginal repair, therefore, is to reattach the lateral vaginal walls to the ATFP.

A transverse cystocele occurs when the top of the pubocervical fascia detaches from the cervix or vaginal apex; it is evidenced by the loss of anterior fornix. (When a transverse cystocele occurs following a hysterectomy, the prolapse frequently includes an enterocele and loss of

apical support that must also be repaired.) Central or distal cystoceles involve a loss of support near the pubis and tend to manifest as urethral hypermobility.

When one considers the trapezoidal anatomy of the anterior vaginal wall, the importance of restoring apical support is clear. Several studies have shown that variations in cystocele type and severity are often determined by the degree of apical support. Dr. John O.L. DeLancey and his associates, for instance, found that anterior wall prolapse was due to loss of apical support in one-half of women whose prolapse was measured on MRI scans (*Am. J. Obstet. Gynecol.* 2006;194:1438-43).

In another evaluation—a cohort study of 325 women—investigators similarly found that anterior vaginal wall prolapse was strongly associated with apical prolapse, and concluded that anterior vaginal wall defects that are surgically repaired usually require concomitant repair of the apex (*Am. J. Obstet. Gynecol.* 2006;195:1837-40).

Just as with posterior vaginal wall prolapse, one must first determine which part of the patient's support mechanism has failed. A careful physical evaluation must be done to identify the sites of defects and detachments. By supporting the lateral anterior walls at the level of the ATFP with a ring forceps, one can identify paravaginal defects and determine the role of apical failure.

While supporting the apex with a ring forceps, I ask the patient to bear down or cough. If her anterior wall remains in place and her cystocele disappears, I know an apical suspension is needed at the time of surgery. If she still has some relaxation, an apical suspension as well as an anterior colporrhaphy are needed.

One must also understand which symptoms are bothering the patient, if they are related to the physical findings, and if surgical correction of the anatomy will im-

prove her symptoms. Each woman should then be appropriately counseled about the possible impact of prolapse surgery on both bladder and sexual function.

It is a common misperception that most patients with cystoceles also have stress urinary incontinence. Descent of the mid-vagina under the bladder base may actually reduce the chance of stress urinary incontinence occurring. Instead, voiding dysfunction is more common, as straining and increased abdominal pressure can cause the cystocele to be pushed to the point that it creates an outlet obstruction by kinking or compressing the urethra.

In a review we conducted of 35 women with stage 3 or 4 anterior wall prolapse and elevated postvoid residuals greater than 100 mL on two separate occasions, 31 women (89%) had normal postvoid residuals following reconstructive surgery and correction of their anterior wall prolapse (*Am. J. Obstet. Gynecol.* 2000;183:1361-4).

Paradoxically, correction of the cystocele can unmask "occult" stress urinary incontinence. Prior to surgery, a full bladder stress test with the prolapse reduced may indicate that the patient is at risk for stress incontinence symptoms after her prolapsed repair. If a sacrocolpopexy is planned, the CARE (Colpopexy and Urinary Reduction Efforts) trial recommends the placement of a Burch colposuspension at the time of surgery, regardless of preoperative urodynamics. Whether this recommendation is true for vaginal repairs is currently unknown.

Preoperative discussions with the patient concerning her risks of incontinence after cystocele repair, the benefits and risks of prophylactic anti-incontinence surgery, and the need for future surgical correction should be had as part of the surgical decision-making process.

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Continued from previous page

### Technique for Anterior Colporrhaphy

Traditional anterior colporrhaphy involves plication of the “endopelvic fascia” or fibromuscular layer of the vaginal wall after the vaginal wall is split. Buttressing of the bladder neck with a Kelly plication stitch was originally described by Howard Kelly in 1913.

The anterior vaginal wall is grasped on each side of the midline with Allis clamps. The cuff is grasped if a vaginal hysterectomy has been performed. If the uterus is in situ, the Allis clamps are used to grasp the vagina approximately 1 cm from the cervicovaginal junction, and an initial transverse incision is made.

The anterior wall, between the mucosa and bladder, is injected with 10 cc of vasopressin solution, 20 U in 50 cc of normal saline. This improves hemostasis and hydrodissects the space. A midline incision to within 1-2 cm of the urethrovaginal neck is made.

The use of “three-point” traction can help with the dissection of the muscularis. The vagina is then grasped with several Allis clamps. The surgeon’s index finger distends the vaginal wall and allows the surgeon to determine the thickness of the dissection with the Metzenbaum scissors. The assistant can provide countertraction with a tonsil clamp or DeBakey forceps. The fibromuscular layer is split to the level of the inferior pubic ramus. The procedure is repeated on the opposite side of the vagina.

One modification I prefer is to begin the plication at the apex instead of the bladder neck. This way, I avoid the pitfall of stopping short of the apex and leaving a “gap” or weakness in the repair. It is the apical portion of the repair that is most important. I use permanent sutures, preferably 2-0 Ethibond.

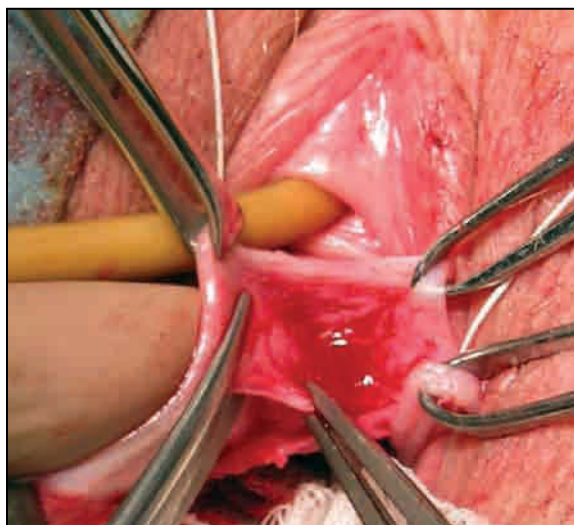
If the vaginal wall is the length needed to reach the apical supports, I use a transverse mattress stitch to plicate the fascia. If the vaginal wall needs to be shortened, I use a vertical mattress stitch. This will generally shorten the anterior wall 2-3 cm. For a large cystocele, two layers of plication can be used. The excess vaginal tissue is excised and closed with interrupted or running fine absorbable sutures.

When an apical repair procedure such as uterosacral ligament suspension or sacrospinous ligament suspension is performed in conjunction with anterior colporrhaphy—which is more often than not—the sutures for the apical repair should be placed and held prior to initiating the anterior colporrhaphy.

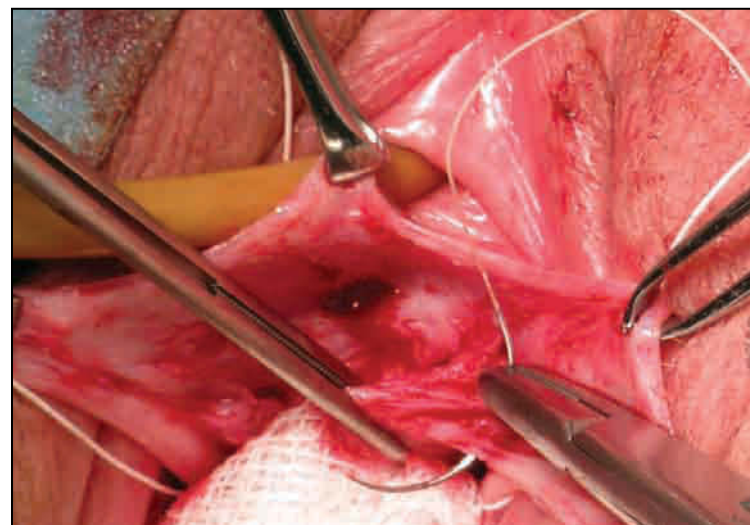
At the end of the anterior repair, the apical sutures are then incorporated into the vaginal cuff. Regardless of the type of transvaginal suspension, it is beneficial to bring one arm of the suspension suture through the anterior wall of the cuff and the other arm through the posterior cuff. This way, the anterior and posterior walls are brought together and suspended when the suture is tied.

### Graft Use

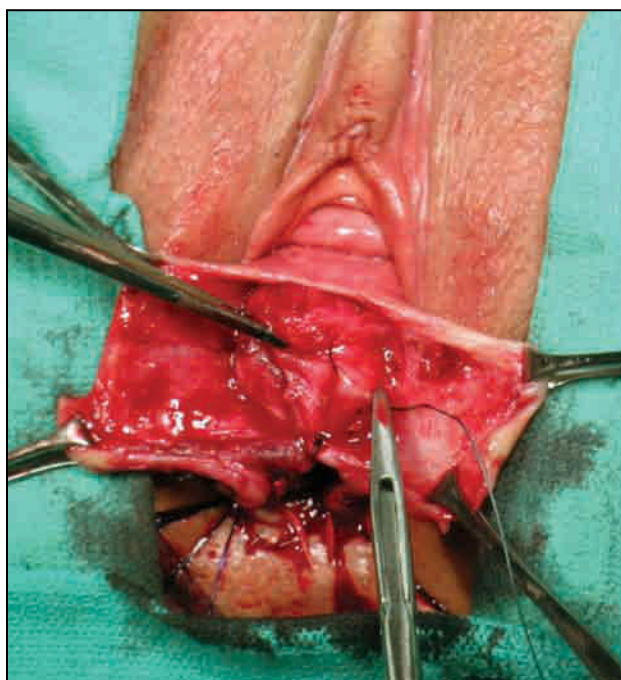
In 2008, the Society of Gynecologic Surgeons (SGS) systematically reviewed the literature and published clinical practice guidelines on vaginal graft use. The SGS



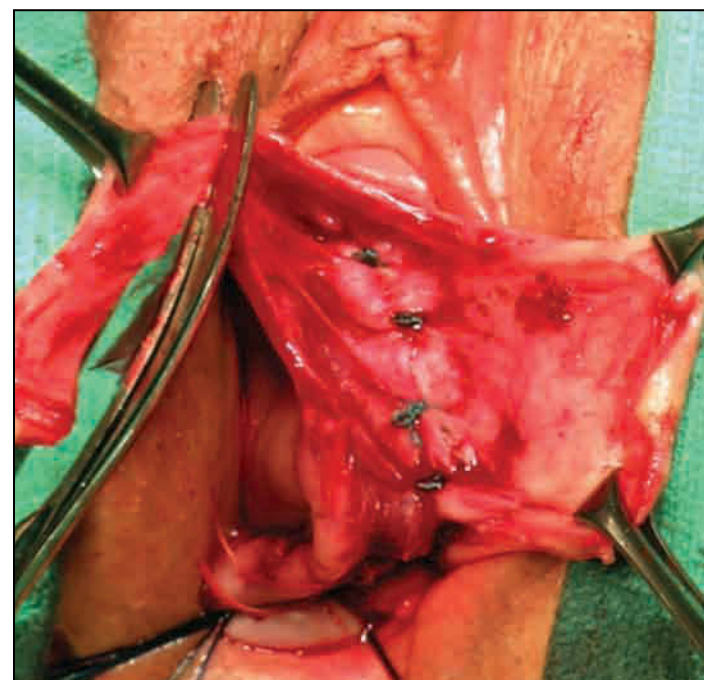
Three-point countertraction aids in the dissection of the vaginal wall.



The first vertical mattress stitch is placed at the vaginal apex during the surgery.



The second horizontal mattress stitch is placed, plicating the fibromuscular wall of the anterior wall.



The plication is complete. Minimal vaginal wall is trimmed prior to closing.

group concluded that nonabsorbable synthetic graft use may improve anatomic outcomes of the anterior vaginal wall, but that there are trade-offs in regard to additional risk. While more randomized studies on new mesh products are being conducted and reported, the data simply are insufficient to determine the anatomic or symptomatic efficacy of these types of grafts, the group said (*Obstet. Gynecol.* 2008;112:1131-42).

Similar to the SGS review, the Cochrane Collaboration completed a systematic review and concluded that the use of mesh or graft inlays at the time of anterior vaginal wall repair may reduce the risk of recurrent cystocele but that there was insufficient evidence to make recommendations for anterior vaginal wall or apical repair (*Cochrane Database Syst. Rev.* 2010;CD004014 [doi:10.1002/14651858.CD004014.pub4]).

Overall, the few randomized trials that have been done illustrate the balance of risks and benefits that the surgeon and patient must weigh prior to considering the use of vaginal mesh or graft for the treatment of anterior wall prolapse.

One study that randomized 202 women to anterior colporrhaphy with or without a low-weight polypropylene mesh showed lower recurrence of anterior wall prolapse at 1 year with mesh than without mesh on physical examination using the Pelvic Organ Prolapse

Quantification (POP-Q) system, but no differences in patient symptoms.

In this trial, the cure rate 1 year after surgery (defined as POP-Q stage 0 or 1) was significantly higher after the mesh-augmented repair compared with standard anterior colporrhaphy (62% vs. 93%). The use of mesh was, however, associated more often with stress urinary incontinence (23% vs. 10%). There were no differences in symptomatic outcomes. Mesh exposure was significant in the augmented group, 17% vs. 0% (*Obstet. Gynecol.* 2007;110:455-62).

In a one-surgeon, randomized controlled trial of 38 women who had traditional anterior colporrhaphy and 37 who had polypropylene mesh repair using the Perigee Transobturator Prolapse Repair System, Dr. John N. Nguyen concluded that repair with polypropylene mesh reinforcement offered lower anatomic recurrence rates at 1 year than did anterior

colporrhaphy without mesh reinforcement (*Obstet. Gynecol.* 2008;111:891-8).

In this study, prolapse and incontinence symptoms improved significantly in both treatment groups.

Overall, the current evidence seems to support the use of synthetic mesh to augment repairs of anterior vaginal prolapse but at the expense of an increased rate of complications, particularly mesh exposure.

In my practice, most recurrent anterior wall prolapses are associated with apical descent as well. In those patients, I recommend a sacrocolpopexy performed laparoscopically. I would reserve the use of transvaginal mesh for women who have recurrent isolated anterior vaginal prolapse with a well-supported apex. ■

DR. FENNER disclosed that she has received research funding from AMS in Minnetonka, Minn., the maker of the Perigee Transobturator Prolapse Repair System.

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Edited by Charles E. Miller, M.D.

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