Laparoscopic Pelvic Floor Repair

Part III – Support of the Anterior and Posterior Vaginal Wall

Robert D. Moore DO*, John R. Miklos MD*, Neeraj Kohli MD**

*Urogynaecology & Reconstructive Pelvic Surgery, *Atlanta Urogynaecology Associates, Atlanta GA; **Harvard Medical School, Cambridge MA.*

LEVEL II SUPPORT - LAPAROSCOPIC APPROACH TO CYSTOCELE REPAIR

As previously described, the pubocervical fascia of the anterior vaginal wall provides primary support for the bladder and urethra. The pubocervical fascia is apically suspended by the uterosacral-cardinal ligament complex, laterally attached at the fascia overlying the obturator internus via the arcus tendineous fascia pelvis, and distally fused to the pubic bone and urogenital diaphragm. A breech or break in the integrity of the pubocervical fascia may result in a cystocele. Fascial breaks can be defined by the location of the break: transverse defects occur as a horizontal defect at the pericervical ring, lateral or paravaginal defects (Figure 6) occur at the insertion of the white line on the lateral pelvic sidewall, and midline defects occur along the longitudinal axis of the anterior vaginal wall.

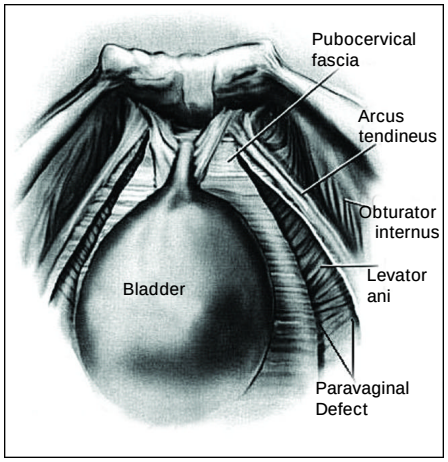


Figure 6. Paravaginal defects: lateral vaginal wall defects result in cystourethrocele as seen from the space of Retzius.

Successful surgical correction of the cystocele depends on the type of defect found in the pubocervical fascia. Clinical preoperative assessment in the office is important in determining the correct surgical approach. On examination of the anterior vagina, anterolateral support should be confirmed. If one or both anterolateral sulci are absent and vaginal rugation is present, then a detachment of the pubocervical fascia from the fascial white line – a paravaginal defect – should be suspected.

Cystocele due to lateral defects can be treated in a site-specific fashion by performing a paravaginal repair. (Figure 17)

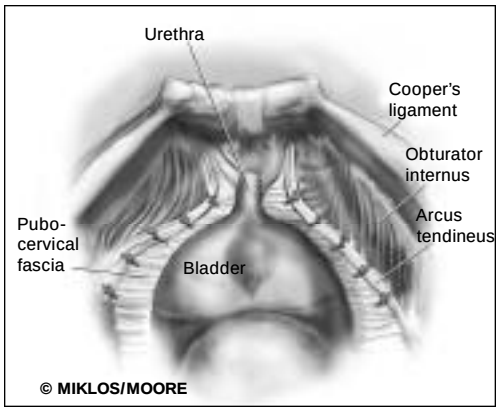


Figure 17. Paravaginal repair: the reapproximation of the pubocervical fascia to the obturator internus at the arcus tendineus fascia pelvis.

The paravaginal repair has been described via open abdominal, transvaginal and laparoscopic approaches.[17] The authors believe that the abdominal and laparoscopic approaches are the preferred method for the following reasons:

1) transvaginal paravaginal repairs requires extensive dissection and theoretically could lead to an increase in local neuropathy;
2) abdominal/ laparoscopic approaches allow for an unobstructed view of the white line and pubocervical fascial break, while the transvaginal approach reduces visualization and may impede the optimal site specific repair;
3) extensive lateral dissection for the transvaginal approach requires the surgeon to completely take down any remaining good lateral attachment, allowing for paravaginal access to the white line, and
4) the laparoscopic/abdominal approach, compared to the transvaginal approach, does not require splitting of the vaginal mucosa from the underlying fibromuscular “fascia” and thus provides more secure suture attachment on the vagina.

Laparoscopic paravaginal repair – technique

Port placement is a matter of surgeon's preference. We routinely perform open laparoscopy at the inferior margin of the umbilicus and place three ancillary ports under direct vision. The bladder is filled in a retrograde manner with 200-300 m/ of normal saline, allowing for identification of the superior border of the bladder edge. Entrance into the space Retzius is accomplished by a transperitoneal approach using a harmonic scalpel. The incision is made approximately 3 cm above the bladder reflection, beginning along the medial border of right obliterated umbilical ligament. Immediate identification of loose areolar tissue at the point of incision confirms a proper place of dissection.

After the space of Retzius has been entered and the pubic ramus visualized, the bladder is drained in order to prevent injury during dissection. Separation of the loose areolar and fatty layers using blunt dissection develops the retropubic space, and dissection is continued until the retropubic anatomy is clearly visualized. The pubic symphysis and bladder neck are noted in the mid-

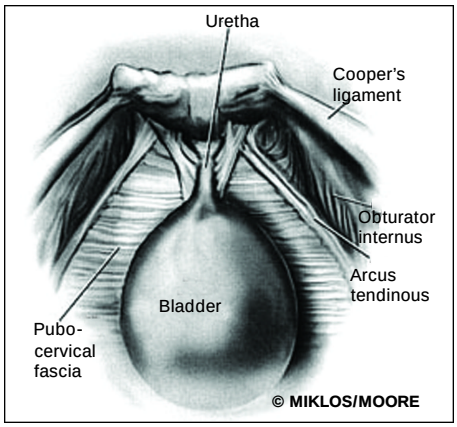
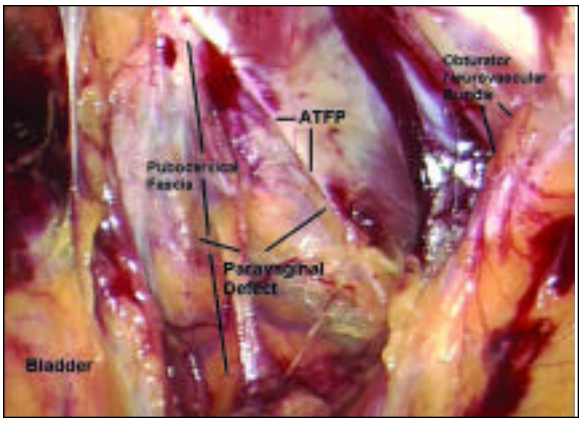


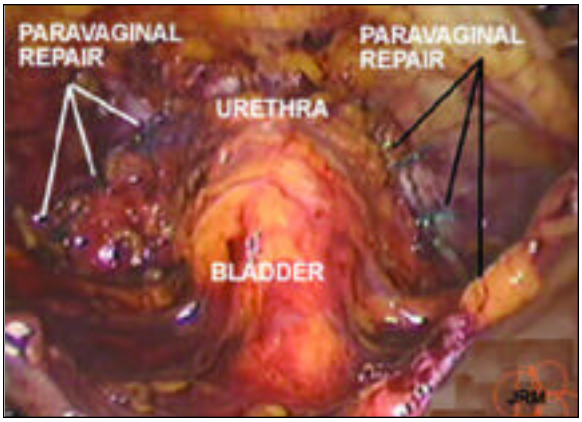
Figure 5. Space of Retzius – normal anatomy.

line and the obturator neurovascular bundle, Cooper's ligament and the arcus tendinous fascia pelvis are identified bilaterally along the pelvic sidewall (Figure 5). The anterior vaginal wall and its point of lateral attachment from its origin at the pubic symphysis to its insertion at the ischial spine are identified. If paravaginal wall defects are present, then the lateral margins of the pubocervical fascia will be detached from the pelvic sidewall at the arcus tendinous fascia pelvis. To facilitate identification, it is often necessary to elevate the vagina with a finger in the vagina while gently dissecting the bladder and the paraurethral and paravesical fat medially. Often, the broken edge of the pubocervical fascia has fallen inferior to the bladder and its elevation is the optimal method to discern the discrete fascial break. Once appropriately dissected, the lateral margins of the detached pubocervical fascia and the broken edge of the white line can usually be clearly visualized, confirming the paravaginal defect.

The first suture is placed near the apex of the vagina though the paravesical portion of the pubocervical fascia. The needle is then passed through the ipsilateral obturator internus muscle and fascia around the arcus tendineus fascia at it origin 1-2 cm distal to the ischial spine. The suture is secured using an extracorporeal knot-tying technique. Good tissue approximation is accomplished without a suture bridge. Sutures are placed sequentially along the margins of the paravaginal defects from the ischial spine toward the urethrovesical junction. If the patient does not demonstrate stress urinary incontinence or urethral hypermobility, a series of 4-5 sutures are placed ipsilaterally between the ischial spine and the midurethra. If the patient has bilateral paravaginal defects, the same technique is employed



Pic A. Paravaginal Defect on Right Side.



Pic B. Completed Bilateral Paravaginal Defect Repair.

on the opposite side. (Pic A & B) In our experience, unilateral paravaginal defects are rare. After reviewing 300 of our operative reports for patients undergoing paravaginal repair, (279/300) 93% of patients were found to have bilateral paravaginal defects.

If patients have stress urinary incontinence, a retropubic urethropexy procedure can be performed concomitantly. Incontinence and its laparoscopic treatment is beyond the scope of this paper. However, this information was recently reviewed and described by the authors.[18]

Level 2 Support Procedures - Clinical Results

Clinical results are lacking with respect to the

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laparoscopic approach to paravaginal repair. However, many surgeons, including the authors, believe that laparoscopy is only a mode of surgical access. The technique of reconstructive surgery, if performed identical to the open approach, should have cure rates equal to that of abdominal procedures previously studied.

There is limited data reviewing the complication rate of lower urinary tract injuries. Data on open Burch procedures alone, using 2 sutures bilaterally, reports injury to the lower urinary tract to be approximately 10%. Speight et al demonstrated a 2.3% bladder injury rate with no ureteral injuries when performing a laparoscopic paravaginal repair with or without a Burch using 4-5 sutures bilaterally (total 8-10 sutures).[19] The authors attribute the lower complication rate to the experience of the surgeons and the visualization afforded by laparoscopy.

LEVEL II & III SUPPORT – LAPAROSCOPIC APPROACH TO RECTOCELE REPAIR

Laparoscopic repair of a rectocele is infrequently performed as most gynecologic surgeons find the vaginal approach to be preferred. However, in some cases including high rectocele or placement of mesh/graft from the perineal body to the uterosacral ligaments, the laparoscopic technique may have additional advantages. The technique employees open laparoscopy and placement of ports as previously described. The rectovaginal septum is opened using electrocautery, harmonic scalpel, or laser. Blunt dissection with dissectors, hydrodissection or sharp dissection may be used to open the rectovaginal space distally to the perineal body. This dissection should follow surgical planes and is often bloodless. The perineal body is sutured to the rectovaginal septum using delayed absorbable suture. The rectovaginal fascial defects are closed with no. 0 nonabsorbable suture. If the rectovaginal fascia is detached from the iliococcygeus fascia, it is reattached with no.0 nonabsorbable suture. The medial aspect of the levator ani muscles may also be plicated, but care should be taken to avoid a posterior vaginal ridge.[19]

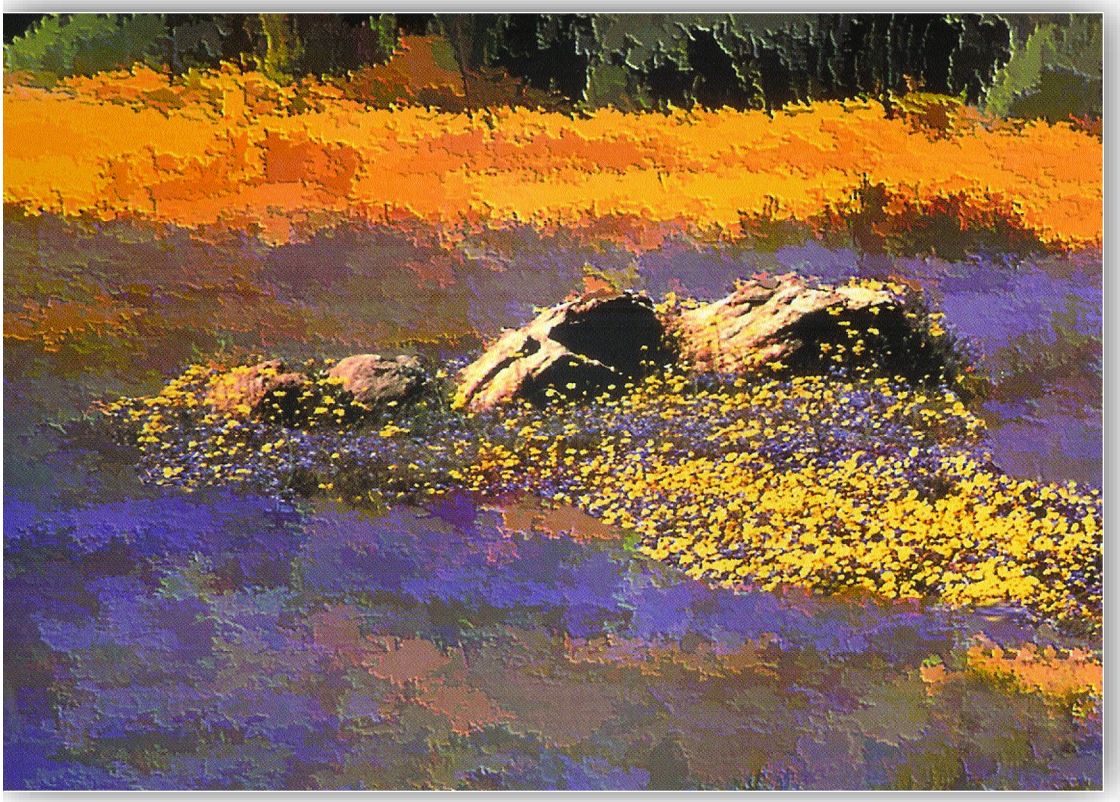
Level 3 Support Procedures - Clinical Results

There is little data regarding the use of laparoscopic reconstructive techniques for the treatment of rectocele. Laparoscopic rectocele repair using a polyglactin mesh was first described by Lyons with an 80% cure rate in 20 women followed at three-month intervals for one year. No long-term complications were noted.[20] Although associated with high success rates, the procedure is technically challenging and deviates from the traditional vaginal approach to rectocele adopted by most gynecologic surgeons.

Discussion

Laparoscopy should only be considered a mode of surgical access, which should not significantly change the technique of operative reconstructive surgery. Laparoscopy benefits the surgeon by improving visualization, decreasing blood loss and magnifying the pelvic floor defects which need to be repaired. Other advantages including less postoperative pain, shorter hosptial stays, shorter recovery time and earlier return to a better quality of life have also been described in the literature. Disadvantages often cited in the literature include increased operative time and associated increased costs. The authors' personal experience is the operative time is similar and in many times reduced especially for patients with a high body mass index. However, complex operative laparoscopy is associated with a steep and lengthy learning curve after which operative time is can be significantly reduced based on surgeons experience and laparoscopy skills as well as the quality of the operative team.

A thorough knowledge of pelvic floor anatomy is essential before undertaking any type of reconstructive pelvic surgery, and advanced knowledge of laparoscopic surgery and suturing are essential to perform the surgical procedures discussed in this review. Despite the paucity in the literature, laparoscopic pelvic reconstructive surgery will continue to be driven by patient demands as well as surgeon preference. With increasing experience, greater data should support its continued use and favorable long-term outcomes.



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