



# Surgically Supporting the Apex at the Time of Benign Hysterectomy... Just Do It!

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## Editorial

Pelvic Organ Prolapse (POP) is an increasingly common occurrence over the course of a woman's lifetime, especially in parous women (more than 50% of women who have given birth). The risk of developing POP increasing with age, obesity, White race, family history, and prior pelvic surgery (such as hysterectomy). It affects more than 3 million women in the US alone, often negatively impacting sexual function and overall quality of life. Currently, no universal guideline exists to advise the gynecologist on when an apical (Level I) support procedure should be incorporated into a surgical procedure to either address current prolapse or to prevent and protect against future occurrence in patients at risk. Perhaps even more of a void than the lack of well-established scientific evidence is that clinicians often fail to ask patients about POP symptoms, inquire about risk factors or significant family history, nor document presence of prolapse on preoperative examination when planning hysterectomy for other indications. Currently, apical support loss is widely under recognized and therefore, the opportunity to address it during hysterectomy is missed [1,2]. As with all surgical planning, an interactive consent process is critical in determining if this procedure truly meets the needs and goals of the individual patient. As we move into an era of value-based and quality-based care, it is important to recognize the importance of evaluating the "whole patient" including secondary and future gynecologic needs. While the levels of support to the vagina (as described by Delancey) are distinct, they are also interrelated. Therefore, when a Level I defect is corrected, an apical detachment type cystocele can be corrected. Hysterectomy remains the most common major gynecologic procedure performed in the US, and most are performed for benign conditions other than POP. Although evidence supports the reestablishment of support at the time of hysterectomy, this rarely occurs, and puts women at risk of future prolapse. In an RCT by Cruikshank et al. [3] for post hysterectomy vaginal vault prolapse, the use of a modified McCall's procedure (incorporating the vaginal apex directly to the uterosacral ligament complex *via* suture) resulted in a significantly lower rate of apical vaginal prolapse than use of simple cuff closure (with or without a peritoneum purse-string stitch, not involving uterosacral ligament complex). Despite this Level I evidence, current practices in the performance of apical support procedures at the time of hysterectomy are underutilized and highly variable. These procedures can be performed open, vaginally, laparoscopically, or robotically. For the scope of this article we aim to describe techniques for supporting the apex that can be easily performed by a general gynecologist at the time of the minimally invasive hysterectomy. For the purpose of the discussion we will exclude the treatment of primary severe prolapse, such as sacral colpopexy with polypropylene mesh or vaginal obliteration.

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## Laparoscopic (or Robotic) Approach

At the time of laparoscopic hysterectomy, either conventional or robotic assisted, apical (Level I) support can be easily restored by performing an uterosacral ligament suspension in several easily reproducible steps.

### Identification of uterosacral ligaments and ureters

The ligaments are best delineated by putting cephalad and ventral traction on the uterus using the uterine manipulator. It is vital that the ureter (which is located several centimeters lateral to the uterosacral ligament) remains in view during the entire procedure. At this time, a "relaxing incision" can be made in the peritoneum just lateral to the uterosacral ligament in order to maximize the distance between the lateral edge of the ligament and the ureter, although this is not routinely necessary. If needed, we make this incision using a monopolar energy device such as monopolar scissors, spatula, or a hook.

### Tagging proximal uterosacral ligaments prior to hysterectomy

The proximal 1/3 of the uterosacral ligament is then tagged 2 cm to 3 cm from the sacrum

using permanent suture. Permanent suture should be used, as it is associated with lower failure rates when compared to absorbable suture. We elect to use 0-Gore Tex and we pass through the ligament twice, in a helical fashion to ensure that the ligament is properly secured. At this location, the ureter is located a rather large distance away, as the course of the ureter runs from lateral (at the pelvic brim) to medial (as it approaches the cervix). The needle is then carefully placed in the posterior cul-de-sac, and the free end of the Gore Tex suture is brought into the abdomen through the lateral port and placed into the paracolic gutter under direct visualization. The suture placed as described does not interfere with the hysterectomy portion of the procedure.

### **Incorporation of suture into distal uterosacral ligaments at the vaginal cuff or cervical stump (if supracervical hysterectomy)**

For a total hysterectomy, the specimen and manipulator are removed and the vaginal cuff is closed in a typical fashion. After adequate cuff closure, a vaginal probe is inserted in the vagina with cephalad traction to help delineate the uterosacral ligaments and the pubocervical fascia for suspension suture attachment. We then retrieve the needle from the cul-de-sac, and we place the needle through the distal uterosacral ligament and posterior vaginal cuff (incorporating the rectovaginal fascia) with care taken not to enter into the vaginal lumen with the permanent suture. We then place the needle through the pubocervical fascia of the anterior vaginal cuff, with care taken to remain medial to the vaginal cuff angle sutures. In the patient with symptomatic prolapse we will place a second permanent suture of 0-Ethibond for added securement of the ligament. These are placed bilaterally, in a similar fashion to the Gore- Tex placement.

### **Knot -tying**

Both ends of the Gor-Tex suture are brought out through the lateral port and an extracorporeal knot tying technique is utilized (and preferred for re-approximating tissue under tension). If performing the procedure robotically, an intracorporeal knot tying technique is easier and preferred. A total of 6 to 8 throws are made. The exact same procedure is performed on the contralateral side. If Ethibond suture was used, these are then tied down in a similar fashion. Rarely, such as in cases of partial cul-de-sac obliteration, a unilateral uterosacral ligament suspension can be considered.

### **Cystoscopy**

This is always performed at the completion of this procedure to evaluate for ureteral patency and bladder injury. We recognize that this procedure can be modified at the preference of the surgeon, such as using a different permanent suture type, different knot tying techniques (intracorporeal or extracorporeal), or using a barbed or knotless suture. Currently there is no compelling evidence to determine the superiority of one technique over another.

## **Vaginal Approach**

At the time of vaginal hysterectomy, it is our practice to routinely shorten the uterosacral ligaments bilaterally for prophylactic prolapse as well as symptomatic prolapse, prior to incorporating the uterosacral and cardinal ligaments to the vaginal apex.

### **Performance of hysterectomy**

We recommend that the uterosacral and cardinal ligament

pedicles be tagged separately for easy identification, so that they can reincorporate into the vaginal cuff angles. Gentle traction can then be placed on the uterosacral pedicles bilaterally to aid in suspension.

### **Suture placement through proximal uterosacral**

With gentle traction on the uterosacral pedicle, a permanent suture is placed through the uterosacral ligament as high as deemed feasible and safe by the surgeon (we aim to get to the level of the ischial spine). We elect to use a 0-Gore Tex suture. Trendelenburg position, vaginal wall retractors, as well as sweeping the bowel away with a sponge on a stick or vaginal pack, may help with visualization. As mentioned earlier in this article, the ureter is located on average 3 cm to 4 cm lateral to the uterosacral at this location.

### **Incorporation of suture into distal uterosacral ligaments and the vaginal cuff**

The needle is then passed through the tagged distal uterosacral on the same side, followed by the posterior peritoneum, and finally it is passed full-thickness through the posterior vaginal cuff [4-7]. This denotes the new vaginal apex. This same needle is then passed back through the full-thickness posterior vaginal cuff (on the opposite side of the midline), followed by posterior peritoneum, then finally through the distal and proximal uterosacral ligament on the opposite side. This suture is then tied down to shorten the uterosacral ligaments and provide proper support to the vaginal vault.

### **Vaginal cuff closure**

The vaginal cuff is then closed in the midline in a vertical fashion, to optimize both vaginal vault support as well as vaginal length. Using 0-Vicryl, we take care to take full-thickness bites to re-approximate the vaginal cuff including the distal uterosacral pedicles in our cuff closure.

### **Cystoscopy**

This is always performed at the completion of this procedure to evaluate for ureteral patency and bladder injury.

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