Sacrospinous Ligament Suspension, With and Without Mesh

The sacrospinous ligament suspension technique was first described by Karl Richter in 1968 and later introduced into the United States by David H. Nichols and Clyde L. Randall in 1971. It has been and continues to be an effective technique for apical suspension via the vaginal route, and is a valuable addition to the surgical armamentarium of the gynecologic surgeon.

In the 1990s, the procedure was done less frequently because of the popularity of uterosacral ligament suspension. Recently, however, sacrospinous ligament suspension has regained popularity for various reasons. The uterosacral ligament technique, for one, requires peritoneal entry, and the ligament is often of variable strength and also can be difficult to identify.

In addition, new tools and variations in technique, such as use of the Capio needle driver, have made sacrospinous ligament suspension easier and safer. Finally, the popularity of vaginal mesh procedures has created renewed interest in sacrospinous suspension as a direct alternative to apical suspension for vaginal apical support. The vagina, compared to the uterine body, is more pliable and has great variation in length, which makes it an effective site for placement of lateral supports.

Prior to Surgery
Vaginal exam prior to initial dissection is helpful in ensuring that the vagina is of adequate length to reach the sacrospinous ligament. Marking of the vaginal apex for placement of suspension sutures sites also is helpful. The vagina is reapproximated to either or both sacrospinous ligaments using an Allis clamp, which is then adjusted in order to maximize vaginal length and reapproximation to the corresponding ligament.

The location of the Allis clamp is then tagged with a full thickness marking suture.

Surgical Dissection
The procedure begins with entry into the sacrospinous space. Traditionally, this dissection has been described through a posterior vaginal mucosal incision associated with rectocele repair. A midline incision is made from the perineal body to the vaginal apex. The vaginal mucosa is then dissected off the underlying rectovaginal septum distally and any enterocele proximally. In the upper third of the vagina, lateral dissection is extended in the pararectal space until areolar tissue is encountered. Blunt dissection is then performed toward the ischial spine in a back-and-forth manner.

The relevant anatomy including the ischial spine, the sacrospinous ligament, the coccygeal muscle, and the lateral side wall with White’s line, is identified. An identical dissection is performed on the contralateral side.

An anterior approach to sacrospinous suspension was described by Peter K. Sands et al. in 2000. This is especially helpful if the patient has only anterior and apical defects without the need for rectocele dissection or is undergoing an anterior mesh augmentation procedure. The anterior vaginal wall is opened, and the endopelvic connective tissue is separated from the pubic ramus at the level of the bladder neck to the ischial spine, exposing the paravesical and pararectal space. The sacrospinous ligament is identified and tagged through this defect.

Perhaps the easiest method of entering the sacrospinous space is through a midcompartment approach just lateral to the enterocele. This is often described with isolated apical/enterocele defects. The vaginal mucosa over the apex/enterocele is incised in the midline. The edges of the incision are grasped using Allis clamps, and lateral dissection is performed between the vaginal mucosa and enterocele sac until loose areolar tissue is noted. Blunt finger dissection in a back-and-forth motion is performed to the ischial spine.

An identical procedure is then performed on the contralateral side. Such midcompartment dissection is associated with very little bleeding and quick access to the sacrospinous space.

Suture Placement
A variety of tools and techniques have been described to place the sacrospinous suspension sutures. Traditionally, a suture placement has been described using a standard needle holder, Miya hook, Deschamps ligature, Shuttl punch, or Nichol-Veronikis ligature carrier. Each device is loaded with the stated needle.

Vaginal retrac- tors (I prefer the Bresky-Navratil retractors) are used to gain exposure to the sacrospinous space until the ligament is visualized. The suture is placed around the sacrospinous ligament approximately two fingerbreadths medial to the ischial spine, with care given to avoid injury to the pudendal neurovascular bundle (Fig. B).

A permanent suture (Ethibond or Gore-Tex) is used for a pulley stitch attachment, while a delayed absorbable suture such as polydioxanone (PDS) is used for a full thickness vaginal attachment. A second suture may be placed just slightly medial to the first at the surgeon’s discretion. Bilateral sacrospinous sutures also could be placed. Bilateral suspension sutures are especially useful when considering mesh augmentation of the anterior and/or posterior segment.

More recently, traditional devices have continued to be refined.
been replaced with the Capio needle driver. This is a disposable multipurpose surgery retrieval device which makes sacrospinous ligament suspension significantly easier, faster, and safer. The device has a medium caliber shaft with a plunger for suture application. The end has a hook which allows push-pull retrieval of a small needle-based suture. Various permanent and delayed absorbable sutures are available. Under direct finger guidance, the device is used to hook the sacrospinous ligament at the appropriate location. Depression of the plunger passes the needle through the ligament, and the needle is then retrieved by fins on the other side. Removal of the device completes placement of the suture.

One of the true benefits of the Capio needle driver is the ability to perform suture placement under direct finger guidance without the need for visualization using retractors – a benefit that minimizes the extent of dissection and the time involved. In my opinion, this device has revolutionized sacrospinous suspension by allowing more physicians to perform the procedure safely and effectively.

The next evolution in sacrospinous suspension will include anchor-based single-point attachment – an approach that has recently become available and may supplant traditional suture placement, which can potentially strangle tissue and result in postoperative pain. Additional clinical experience is required before this technique can be supported, but initial results are encouraging, especially with respect to postoperative sacrospinous pain.

Completion of Procedure

Once the suture(s) are in place, a rectal exam is recommended to exclude unintentional rectal injury or suture placement. Once confirmed, tie-down of the suture(s) should be used. If the suture(s) are passed through the vaginal epithelium and tied in a knot under the mucosa. This somewhat allows full thickness attachment of the vagina at the apex (Fig. C, D). The mucosal incision by allowing more physicians to perform the procedure based on safety and effectiveness.

If mesh is used, hemostasis should be achieved prior to placing the suture. Placement of the mesh should be considered; this is easiest if the suture was tied vaginally rather than with the traditional pulley stitch technique. With IV indigo carmine followed by urethral stent placement is suggested. Stent placement will allow one to determine the true site of obstruction and safely place the stent. Typically, obstruction associated with sacrospinous sutures allows the stent to be passed 5-9 cm.

Removal of the suspension suture almost always results in resolution of the obstruction with resulting ureteral spill. A repeat suspension suture could then be placed slightly more medial at the surgeon’s discretion. Repeat cystoscopy should be performed to confirm continued ureteral patency.

Postoperative Complications

Postoperative complications include hematomas, bleeding and complaints of buttock pain secondary to involvement of the pudendal nerve branches. Bleeding should be managed accordingly. If bleeding is significant, reoperation or embolization may be necessary. Small self-limited hematomas can be expectantly managed or drained via vaginal access as needed. It may be best to drain hematomas in cases in which mesh was placed at the time of sacrospinous suspension so as to prevent significant abscess and postoperative infection.

Mild buttocck discomfort following sacrospinous suspension is not uncommon, and it is usually managed conservatively with observation, nonsteroids, and muscle relaxants such as Flexeril. If bleeding is significant, the patient should be managed on a weekly basis to ensure continued improvement.

Severe or persistent pain, removal of the suture should be considered; this is easiest if the suture was tied vaginally rather than with the traditional pulley stitch technique. In the latter case, suture removal involves opening the vagina. Transvaginal excision of the suspension sutures can often be performed in the office or at the bedside with a lighted speculum and long scissors. Most patients report almost immediate relief after removal of the suture.