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Editorial

Stress Urinary Incontinence: Simplifying Therapy

Stress incontinence is a socially disruptive problem in women's health. Increasing life spans, lower tolerance towards social isolation and newer technologies to treat this disorder make it an important subject for study. Non surgical options such as pelvic floor exercises, behavioral modifications and biofeedback should be attempted before surgery. Surgery for stress incontinence has been performed on women for over a century. More than 200 procedures have been described in the literature for the treatment of stress incontinence. This extraordinary number reflects a lack of consensus as to the best intervention for this problem. Surgical procedures have veered between the overly simplistic (anterior colporrhaphy, needle suspensions) and the extremely complicated (traditional suburethral slings).

The anterior vaginal repair and Kelly's stitch was the most popular primary procedure for stress incontinence up to the 1970s. It remains in contemporaneous use largely because of the relatively low morbidity of the procedure and its familiarity for gynecologists as an operation for prolapse. The rate of serious complications is less than 1% and denovo detrussor instability and long term voiding dysfunction are rare. However, in today's surgical practice, it is well-established that performing an anterior repair or Kelly plication for the treatment of SUI is substandard care. [1] The failure rates are high and recurrence is common. A similar problem exists with long needle procedures. A number of procedures have been described by Stamey, Pereyra, Raz and other surgeons. They are relatively simple and have a low morbidity but failure rates preclude their use in modern gynecological surgery. [1]

Suburethral sling procedures were developed initially in the 1880s. The earliest described sling procedure was in 1907 by Giordano, who used the gracilis muscle. Subsequently, procedures were described by Goebell, Stoeckel, Thompson and Aldridge. A variety of autologous materials such as gracilis muscle, fascia lata, rectus abdominis muscle and fascia have been utilized in these procedures. Aldridge's procedure with fascia lata was the forerunner of sling procedures from the 1940s. [2] Difficulties with autologous grafts include inadequate length or poor quality of the tissue and the complications of a harvesting technique (i.e., additional incision, risk of incisional hernia at harvesting site). [3]

Presently, the gold standard of surgical care for stress incontinence are the retropubic procedures (Burch colposuspension and the Marshall Marchetti Krantz procedure) and midurethral slings (TVT, TOT, SPARC etc.). Retropubic procedures involve abdominal incision. This translates into a greater morbidity, hospital stay and recovery period. Cure rates for these procedures range from 85% to 90% at 1 to 5 years, and most 10-year data with more than a 70% cure rate. [4] The risk of complications in the form of detrussor instability and voiding dysfunction is about 10%. The MMK procedure has an additional risk of periosteitis of the pubic symphysis and is now given up in favor of the Burch colposuspension, which has been performed laparoscopically. However, the principles of adequate number of nonabsorbable sutures (at least two on each side) with good suturing should not be compromised in a laparoscopic approach. There is some evidence of poorer objective outcomes for the laparoscopic operation (on urodynamic testing there was an additional 9% risk of failure). Currently, the long-term performance of laparoscopic colposuspension is uncertain. [5]

Modern day synthetic midurethral slings can be looked upon as variations of the classic suburethral sling. Two differences are noteworthy. The first is the placement in

the midurethra. Secondly, the sling is loose and not snugly fitted or sutured to the urethra. The earliest prototype was developed in Europe by Ulmsten and colleagues using a polypropylene mesh.[6] The tension-free vaginal tape (TVT) and its subsequent forms were developed as a minimally invasive outpatient procedure that can be performed under intravenous sedation and local anesthesia. Placement of the mesh is accomplished through a small 1- to 2-cm incision under the mid urethra with blind passage of delivery trocar-needles up behind the pubic bone and through two small 5-mm supra-pubic skin incisions. Most studies report an 85% cure rate with an additional 5–10% significantly improved.[7] Because the needles are passed blindly, common complications of bladder perforation (4–9%) and, less commonly, hematoma formation (1%) can occur.[7] The low incidence of postoperative urge incontinence and obstructive voiding as well as the quick return to normal voiding has been attributed to the minimal peri-urethral dissection and loose application of the sling as directed by the developers. Although a lower incidence of erosion (<1%) has been seen with this synthetic mesh compared with historical numbers for synthetic slings, the blind passage of the needles has caused some notable trauma to bowel, iliac vessels, and epigastric vessels, resulting in life-threatening situations.

In 2001, Delorme developed the transobturator approach to placement of the tension-free tape. The material remained the same – a large pore light-weight, polypropylene mesh.[8] The outside-in approach used a blind passage of the needle-trocar from just lateral to the labia minora, around the ischiopubic ramus, through the obturator foramen, and into the anterior vaginal wall at the level of the midurethra. The inside-out approach passes the needle-trocar from the vaginal incision, around the ischiopubic ramus and through the obturator foramen, to an incision on the inner thigh. The comparison of the retropubic and transobturator approaches has shown equal efficacy.[9] The advantage of the transobturator passage is avoiding potential injury to the bladder, bowel, and iliac vessels. There is also less voiding dysfunction. The disadvantage appears to be less efficacy in treating patients with hypomobility of the bladder neck. There are no long-term studies comparing the inside-out and outside-in transobturator (TOT) approach, although short-term data show no difference in cure rates or complications.

Injectable agents designed to bulk the proximal urethra and bladder neck have been developed as a minimally invasive, office-based procedure for the treatment of SUI. The numerous agents (collagen, macroplastique, hydroxapatite spheres) now in use and in development are primarily aimed for the treatment of hypomobile stress incontinence in patients with poorly functioning urethral sphincters. Cystoscopically guided placement of these agents, either transurethrally or periurethrally, under the urethral mucosa aids in proximal urethral and bladder neck closure during times of increased stress. Treatments may have to be repeated. Cure rates generally range from 20% to 40% with up to 70–80% improved and satisfied at 1 year. [10] Drug therapy with duoloxitene is emerging as a therapeutic option. It is a serotonin and norepinehphrine re-uptake inhibitor. Higher levels of these neurotransmitters at the lower motor neuron nuclei results in greater impulse generation and these are carried through the pudendal nerve resulting in contraction of the striated urethral sphincter. Early results are favorable and the drug is under study. [11] Experimental approaches such as artificial sphincters have also been described in literature.

In conclusion, in modern practice, minimally invasive options such as midurethral tension-free slings and injectable agents are emerging as optimal interventions for stress incontinence.

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