Not a Sling of the Past

Alla Saban MD MPH and Adi Y. Weintraub MD

Department of Obstetrics and Gynecology, Soroka University Medical Center, Faculty of Health Sciences, Ben Gurion University of the Negev, Beer Sheva, Israel

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Stress urinary incontinence (SUI), defined as involuntary leakage of urine associated with increased intra-abdominal pressure during an effort such as sneezing or coughing, is a highly prevalent condition that affects women of all ages and impacts a women's quality of life (QoL). The prevalence of SUI reaches 14% in younger women and up to 35% in older women. Vaginal deliveries, gravidity, advanced age, menopause status, obesity, diabetes, and ethnicity are known risk factors for SUI [1].

Conservative management for SUI includes lifestyle and behavioral modifications, pelvic floor muscle training, pharmacological therapies, and pessaries [2]. In women without sufficient improvement following conservative treatment, surgical treatment should be considered. Over 100 different surgical procedures have been used to treat SUI [3]. The aim of surgical treatment is to improve the support of the urethral-vesical junction and to facilitate urethral closure.

Until the 1990s, open retropubic colposuspension, including Burch colposuspension (BC) and Marshall-Marchetti-Krantz (MMK) procedures, were regarded as the gold standard surgeries for SUI. BC was first introduced by John C. Burch in 1964, and originally was performed as an open abdominal surgery. The procedure involves suspension of the anterior vaginal wall and the paraurethral tissues toward the iliopectineal ligament bilaterally [4]. The MMK procedure includes the suspension of the paravesical tissues approximate to the urethral-vesical junction into the periosteum of the symphysis pubis [5].

The reported overall cure rate using open retropubic colposuspension was up to 90% within the first year of treatment and approximately 80% after 5 years [4].

The first midurethral slings (MUS) were introduced in the 1990s, based on the work of Petros and Ulmsten [6]. Their work led to the concept that midurethral support during an increase in the abdominal pressure can be achieved by placement of a tension free vaginal tape (TVT) [7]. A decade later, Delorme and colleagues [8] introduced the outside-in transobturator suburethral tape (TOT). Two years later de Level [9] introduced a variation of tapes that were inserted in the opposite order (inside-out).

Since introduction of the revolutionary TVT, the surgical management of SUI rapidly shifted from open retropubic colposuspension toward minimal invasive sling procedures, which can be performed under regional or local anesthesia in a surgical daycare clinic setting. Interestingly, sling procedures became the treatment of choice even before high quality data presented positive results [10].

However, recently, the use of slings for SUI substantially diminished due to increasing concerns of lawsuits regarding mesh-related complications. The landmark event was the special notification from the U.S. Food and Drug Administration (FDA) titled, *Serious complications associated with transvaginal placement of surgical mesh in repair of pelvic organ prolapse and stress urinary incontinence*, published in October 2008 [11]. The report described more than 1000 reports of mesh-related complications. The most frequent complications were tissue erosion through vaginal epithelium, pain, infections, urinary problems, and recurrence of prolapse or incontinence. In 2016, the FDA further unclassified mesh used for pelvic prolapse repair to class 3. Nevertheless, this reclassification excluded mesh for SUI. The growing international controversy led to the subsequent publication of vigorous regulatory guidelines, up to banning MUS products in some countries, like the United Kingdom.

Consequently, the interest in older procedures such as the colposuspension regained popularity and surgeons were encouraged to develop new alternative procedures like laparoscopic and robotic colposuspension.

Currently, a wide variety of surgical techniques exist for managing SUI, and still there is a lack of consensus regarding the optimal procedure.

Ford and colleagues [12] evaluated 81 trials. These trials demonstrated an 80% cure rate for up to 5 years after surgery, irrespective of the insertion route or the type of the sling. Overall, sling-related complications were low. Retropubic tapes seemed to be associated with greater risk of bladder injury and postoperative voiding problems compared to TOT. TOT in contrast have a greater risk for

long-term reoperation and higher rates of short-term groin pain. Lapitan and co-authors [4] examined retropubic colposuspension and reported comparable success rates between retropubic colposuspension and sling procedures. However, slings demonstrated higher rates of postoperative voiding disfunctions. Open (abdominal) colposuspension in contrast, was associated with pelvic organ prolapse. A systematic review of evidence from randomized control trials demonstrated comparable effectiveness in the short to medium term (12 months) between retropubic coplosuspension and mesh slings [13].

There are limited data regarding the long-term outcomes of surgical procedures. In a recently published matched cohort study, comparable long-term success rates and low complication rates for both BC and MUS were demonstrated. However, there was an increased risk for posterior compartment prolapse surgery after BC [14]. Evidence available regarding laparoscopic colposuspension, demonstrated comparable effectiveness with quicker recovery time compared with open colposuspension [4].

Modifications in the traditional MUS materials have been introduced. Many different brands have become available, especially polypropylene-based meshes. The brands differ particularly in the fiber configuration and the pore size [15]. One example to a modification of the standard sling is the Serasis® (Serag-Wiessner KG, Naila, Germany), which uses a softer fabric and consequently potentially diminishes tissue trauma and damage. In this edition of the *Israel Medical Association Journal* (*IMAJ*), Leron and colleagues [16] evaluated postoperative pain and complications of this sling. The authors conduced a retrospective cohort study with a follow-up period of one year on 50 patients who underwent implantation of the Serasis TOT by a single surgeon. The study demonstrated low levels of immediate postoperative pain. No decrease in the efficacy and safety of the procedure were noted compared with published data regarding other sling procedures.

This study is important in reassuring clinicians and patients regarding the safety, effectiveness, and reliability of using MUS for SUI. However, the study also emphasizes the need for long-term studies.

The media reports regarding the use of mesh for SUI, without distinction from mesh used for prolapse repair, has established an unjustified negative perception. Given the good short- and long-term outcomes and the safety profile of mesh used for SUI repair, we believe that slings are not a thing of the past. With the right patient selection and adequate risk management practices, MUS remains the preferred surgical technique for treating SUI. Further high-quality research evaluating different surgical techniques with close monitoring of adverse effect and long-term outcomes should be conducted to establish clinically useful patient recommendations. Furthermore, investigating alterations and advances in mesh materials like the investigation that was presented by Leron and colleagues [16] as well as exploring non-prosthetic options should be encouraged to provide alternatives to patients, which are unwilling to undergo mesh placement.

Correspondence

Dr. A.Y. Weintraub
Dept. of Obstetrics and Gynecology, Soroka University Medical Center, Faculty of Health Sciences, Ben Gurion University of the Negev, Beer Sheva 84101, Israel
Email: adiyehud@bgu.ac.il

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