Challenges of Multidimensional Outcome Reporting after Suburethral Mid Urethral Sling Removal

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Purpose: We sought to determine the types and frequency of presenting symptoms in women undergoing suburethral mid urethral sling removal to improve outcome reporting after removal.

Materials and Methods: Following institutional review board approval women who underwent suburethral mid urethral sling removal of 1 mid urethral sling were evaluated for their presenting symptoms and correlation with the UDI-6 (Urogenital Distress Inventory-Short Form) questionnaire. Demographic data were recorded. Patient reported presenting symptoms were categorized into 5 domains, including storage symptoms, voiding symptoms, pain, recurrent urinary tract infections or urinary incontinence. The UDI-6 was reviewed preoperatively and 6 to 12 months postoperatively. We also calculated an ideal outcome, defined as resolution of incontinence, pain, resumption of sexual activity and no need for further anti-incontinence procedures.

Results: A total of 230 women from 2006 to 2017 met study inclusion criteria, including 116 who completed the UDI-6 postoperatively. Of the women 80% had 3 or more presenting symptoms with pain as the most common symptom. The most common combination of symptoms was all 5 domains, which was noted in 46 of the 230 women (20%). An increasing number of symptoms correlated with the total preoperative UDI-6 score. Symptom domains were associated with the corresponding UDI-6 subdomain questions. Domains not covered by the UDI-6, ie recurrent urinary tract infections and dyspareunia, accounted for 27% of reported symptoms. Due to limited data on sexual activity an ideal outcome was reached in 10% of patients but this rate was 40% after sexual activity information was excluded.

Conclusions: In this series the presenting symptoms were manifold in women undergoing suburethral mid urethral sling removal. The UDI-6 questionnaire correlated with many of these complaints. It may be used in outcome analysis in conjunction with self-reported symptoms.

Key Words: urethra; suburethral slings; pelvic pain; lower urinary tract symptoms; urinary incontinence, stress

In the surgical treatment of women with SUI synthetic MUS placement is the most widely adopted approach in the United States.1 Although the true rate of complications associated with MUS is difficult to determine due to the lack of uniform reporting of outcomes,2,3 long-term patient followup

Abbreviations and Acronyms
MUS = mid urethral sling
RMUS = retropubic MUS
SSR = suburethral MUS removal
SUI = stress urinary incontinence
TMUS = transobturator MUS
UDI = Urogenital Distress Inventory
UDI-6 = UDI-Short Form
UI = urinary incontinence
UTI = urinary tract infection
UUI = urge urinary incontinence

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has been recommended to assess for symptoms such as pain, dyspareunia or recurrent UTIs.\textsuperscript{4} Our group has focused on SSR to relieve pain\textsuperscript{5} and on the management of UI after SSR.\textsuperscript{6} As emphasized in a recent editorial, it is regrettable that each study on sling removal only provides a single outcome, for example urinary incontinence, so that readers do not “...know whether pain, dyspareunia and recurrent UTIs resolved after sling removal.”\textsuperscript{7} We agree wholeheartedly with this comment.

Clearly the constellation of symptoms with which patients seeking sling revision may present is not well characterized and women with multiple presenting symptoms may not experience uniform improvement after SSR. In 1 series an idealized symptom domains was described, defined as “resolution of incontinence, pain, resumption of sexual activity and no need for further anti-incontinence procedures.”\textsuperscript{8} This simple outcome based on patient self-reporting is indeed ideal as all of these patients had some degree of UI at baseline before the MUS was placed and will have recall bias on the level of sexual activity before MUS. How can one expect a perfect outcome such as this ideal one after SSR? At the time that it was proposed this multidimensional ideal outcome was devised to provide a patient based tool to permit study comparison after SSR.

We performed a study in a large series of women undergoing SSR, which is the preferred approach to sling revision at our institution. We evaluated groups of presenting symptoms as well as the overlap of these symptoms with preoperative and postoperative validated UDI questionnaire scores. The hope was that the UDI might provide a more inclusive approach to report after SSR than self-reporting alone.

METHODS

Patient Selection

We queried a prospectively maintained, institutional review board approved database for the records of women who underwent SSR at our institution. We excluded patients with multiple or nonsynthetic slings, prior mesh repair of pelvic organ prolapse, neurogenic bladder, urethral erosion, concomitant anti-incontinence procedures, including periurethral bulking agent injection or a fascial suburethral sling, or followup less than 6 months.

Data Collection

Preoperative information included patient demographics, relevant past history and physical examination findings, the type of sling placed and indications for removal. Specifically noted was the presence of vaginal sling mesh exposure as determined by preoperative examination. The total UDI-6 questionnaire score (range 0 to 100) was recorded. Postoperatively patients were seen at 6 weeks, 6 months and yearly thereafter. We reviewed UDI-6 scores and self-reported symptoms after SSR at the 6 to 12-month visit, barring any subsequent medical or surgical intervention to resolve post-SSR symptoms.

Surgical Technique

Transvaginal SSR was performed in all patients as described previously.\textsuperscript{9} In summary, after urethral inspection with a blunt end urethroscope a short transverse incision was made over the anterior vaginal wall beneath the course of the sling mesh. The suburethral sling was identified, divided lateral to the urethra at the 3 or 9 o’clock position to avoid urethral wall injury and completely removed suburethrally. The sling arms were dissected laterally in either direction toward the retropubic or obturator foramen spaces. Cystoscopy was repeated to confirm no urethral injury, followed by closure of the vaginal incision.

Symptom Evaluation

Patient reported symptoms were grouped into 1 of 5 domains, including pelvic or vaginal pain with dyspareunia evaluated separately; recurrent UTIs, defined as 2 or more culture proven symptomatic infections in the last 6 months or 3 in 1 year;\textsuperscript{10} storage or irritative complaints, including frequency, urgency and nocturia; voiding difficulty, including a decreased urinary stream, incomplete bladder emptying or hesitancy;\textsuperscript{11} and urinary incontinence, including stress, urgency and mixed types. Specifically in patients reporting UTIs we evaluated reported symptoms in the other domains after a course of antibiotic treatment. Urinalysis was done in all patients after SSR. Urine culture was sent only if concerning for UTI.

The proportion of women reporting symptoms on each domain was compared and evaluated against UDI-6 scores in aggregate and in regard to individual subdomain questions. Subdomain analyses were performed to test the association of UDI questions 2 and 3 with UI question 5 on voiding difficulty and question 6 on pain. The change in UDI-6 scores at followup visits between 6 and 12 months postoperatively was determined.

Statistical Analysis

Continuous variables were compared with the Mann-Whitney U test. The Wilcoxon signed rank test was used to compare preoperative and postoperative median UDI-6 scores. The Fisher exact test was applied to compare categorical variables. Statistical significance was considered at \( p < 0.05 \). All analyses were performed in JMP®, version 13.0.

RESULTS

Demographics

Study criteria were met by 230 of the 443 women who underwent SSR from 2006 to 2017. Table 1 lists demographic data and past history. RMUSs were more common in this population than TMUSs (48% vs 38%). Of note, 36 patients (16%) had...
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