Urgency Incontinence before and after Revision of a Synthetic Mid Urethral Sling

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Abbreviations and Acronyms

BMI = body mass index
DO = detrusor overactivity
MUS = mid urethral sling
OAB = overactive bladder
Pdet = detrusor pressure
Qmax = maximum flow
SUI = stress urinary incontinence
UDI-6 = Urogenital Distress Inventory
UDS = urodynamic studies
UTI = urinary tract infection
UUI = urge urinary incontinence

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Purpose: We evaluate urgency urinary incontinence outcomes for patients who underwent revision of a presumed obstructing synthetic mid urethral sling and examine risk factors for persistent or de novo symptoms after surgery.

Materials and Methods: From February 1, 2005 to June 1, 2013, 107 women underwent sling revision for new or worsening lower urinary tract symptoms after synthetic mid urethral sling surgery. Patients were grouped based on urgency urinary incontinence symptoms and characteristics associated with persistent or de novo symptoms after revision were examined using logistic regression models.

Results: Median followup was 29 months (IQR 12–54) and time to revision was 21 months (IQR 5–48). Patients presenting for sling revision with urgency incontinence (68) were more likely to experience a more than 6-month delay to revision vs those presenting with obstructive voiding symptoms (39) (OR 3.25, 95% CI 1.33–7.92, p <0.01). After revision urgency incontinence persisted in 76.5% (52 of 68) and was associated with a pre-revision need for anticholinergic medication (OR 5.58, 95% CI 1.44–21.39, p=0.01) and smoking (OR 5.21, 95% CI 1.21–22.49, p=0.03). De novo urgency incontinence developed in 43.6% (17 of 39) of patients and was associated with de novo stress incontinence (OR 15.9, 95% CI 3.2–78.3, p <0.01). Women with post-revision urgency incontinence (de novo or persistent) had higher Urogenital Distress Inventory-6 scores than patients with no or resolution of urgency incontinence.

Conclusions: Patients presenting with new or worsening urgency urinary incontinence after sling placement were more likely to undergo delayed revision compared to those presenting with obstructive voiding symptoms. There is a high rate of bothersome persistent and de novo urgency incontinence after sling revision. Patient expectations should be managed accordingly before sling revision.

Key Words: urinary incontinence, urge; urinary bladder neck obstruction; suburethral slings

Synthetic MUSs have been used widely for the treatment of SUI with excellent success rates.[1] Common postoperative complications include new voiding and storage symptoms. UUI that develops after synthetic MUS surgery is due to iatrogenic obstruction until proven otherwise and decreases patient satisfaction.[2,3] Sling revision addresses these postoperative complications with voiding symptoms resolution in more than

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90% of patients.[4] However, storage symptoms resolution rates have not been consistent and range from 35% to 85%.[3–8] In this study we describe UUI outcomes after revision of an obstructing synthetic MUS and identify risk factors associated with persistent or de novo UUI.

METHODS

Patients undergoing MUS revision at a single institution from February 1, 2005 to June 1, 2013 were identified by CPT codes (57287—removal or revision of sling for stress incontinence, 53500—urethrolysis, transvaginal, secondary, open—including cystourethroscopy). Only patients with synthetic MUS and new or worsening voiding or storage symptoms presumed to be temporally associated with sling placement were included in the study. Women with a biological sling, pain, prior sling revision or sling incision for extrusion or perforation were excluded from analysis. Patients undergoing complete urethrolysis, urethral reconstruction, sling replacement at sling revision, those with less than 1 month followup or with neurogenic DO were also excluded. Validated questionnaires were administered to obtain additional followup data. The study was approved by the institutional review board (IRB#12-1296).

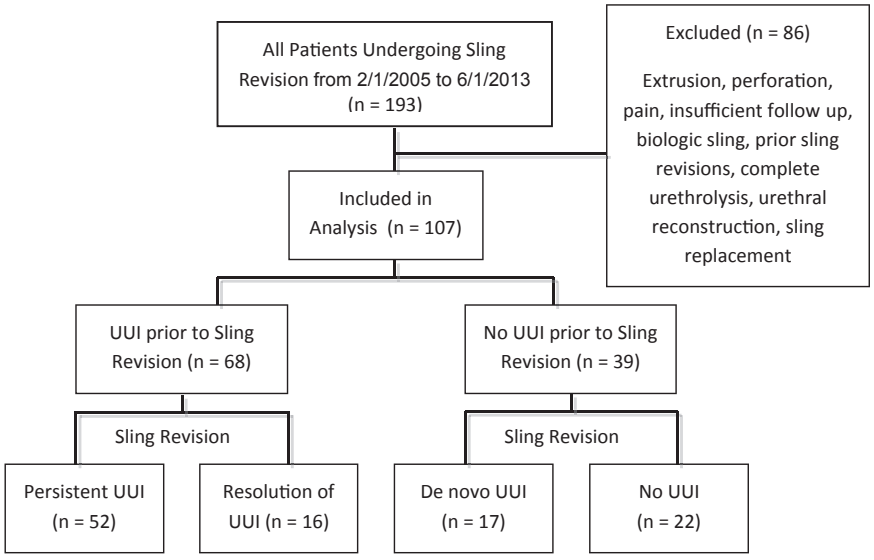
The electronic medical records were reviewed and demographic and clinical data were extracted. SUI and UUI were considered present based on UDI-6 questionnaire response, if available, or patient reported symptoms at the clinic visit before sling revision surgery (as documented in electronic note template that includes urological review of systems inquiring about urgency, frequency, UUI and SUI). Indications for sling revision were based on patient reported symptoms and classified as obstructive voiding (slow stream, prolonged voiding, incomplete emptying, straining to void, need for catheterization) or storage (frequency, urgency or urgency incontinence) with or without recurrent UTI. UDS were performed if clinical presentation was not sufficient to diagnose sling related voiding dysfunction. UDS were performed according to International Continence Society protocol by a urodynamics nurse and interpreted by the physician (see Appendix).[9,10] Patients not able to void for study included those who mounted a detrusor response with no flow. The surgical revision technique was based on surgeon preference and sling incision or excision was performed (portion of the sling removed).

Patients were contacted by telephone or mail to administer the UDI-6 and questions 6, 7 and 8 of the SSQ-8 (Surgery Satisfaction Questionnaire) (see Appendix).[11,12] Followup time was calculated based on the last visit note, mailed questionnaire or telephone interview, whichever was last.

Data were analyzed using JMP Pro® 10.0.2 and R (www.r-project.org). Results were presented as means and standard deviations or median and interquartile range for continuous variables, and percentages or proportions for categorical variables. Continuous variables were compared with the Wilcoxon rank sum test, and categorical variables with the chi-square test or Fisher's exact test with 2-tailed tests. Logistic regression models were used to identify risk factors for persistent or de novo UUI. Multivariable models were selected based on Akaike and Bayesian information criteria. All results were considered significant at $\alpha=0.05$.

RESULTS

A total of 193 patients were identified with CPT code 57287 or 53500 from February 1, 2005 to June 1, 2013 (see figure). Overall 86 patients were excluded from study because of sling extrusion (29), perforation into the urinary tract (11), significant pain (14), insufficient or no followup (3), biological MUS placement at initial surgery, multiple prior surgeries or complete urethrolysis (29). Some patients may have had mixed



Study cohort