Treatment Success of Retropubic and Transobturator Mid Urethral Slings at 24 Months

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Purpose: Longer term comparative efficacy information regarding transobturator and retropubic mid urethral slings is needed. We report 24-month continence rates, complications and symptom outcomes from a randomized equivalence trial.

Materials and Methods: Primary outcomes were objective (negative stress test, negative pad test and no re-treatment for stress urinary incontinence) and subjective (no self-report of stress urinary incontinence symptoms, no leakage episodes on 3-day bladder diary and no re-treatment for stress urinary incontinence) success at 24 months. The predetermined equivalence margin was ±12%.

Results: Of 597 randomized participants 516 (86.4%) were assessed. Objective success rates for retropubic and transobturator mid urethral slings were 77.3% and 72.3%, respectively (95% CI for difference of 5.1% was −2.0, 12.1), and subjective success rates were 55.7% and 48.3%, respectively (CI for difference of 7.4% was −0.7, 15.5). Neither objective nor subjective success rates met the prespecified criteria for equivalence. Patient satisfaction (retropubic 86.3% vs transobturator 88.1%, p = 0.58), frequency of de novo urgency incontinence (retropubic 0% vs transobturator 0.3%, p = 0.99) and occurrence of mesh exposure (retropubic 4.4% vs transobturator 2.7%, p = 0.26) were not significantly different. The retropubic mid urethral sling group had higher rates of voiding dysfunction requiring surgery (3.0% vs 0%, p = 0.002) and urinary tract infections (17.1% vs 10.7%, p = 0.025), whereas the transobturator group had more neurological symptoms (9.7% vs 5.4%, p = 0.045).

Conclusions: Objective success rates met the criteria for equivalence at 12 months but no longer met these criteria at 24 months. Subjective success rates remained inconclusive for equivalence. Patient satisfaction remained high and symptom severity remained markedly improved. Continued surveillance is important in women undergoing mid urethral sling surgery.

Abbreviations and Acronyms

AE = adverse event
MUS = mid urethral sling
QOL = quality of life
RMUS = retropubic mid urethral sling
SAE = serious adverse event
SUI = stress urinary incontinence
TMUS = transobturator mid urethral sling
UI = urinary incontinence
UTI = urinary tract infection

Key Words: urinary incontinence, stress; suburethral slings; treatment outcome

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MID urethral slings with synthetic mesh are the most frequently used surgical procedures for stress urinary incontinence in the United States and Europe.[1,2] Two common approaches are used to place the sling at the mid urethra. The sling is passed transvaginally behind the pubic bone with the retropubic approach,[3] whereas with the transobturator approach it is passed laterally through the obturator foramen to avoid the pelvic organs and vasculature in the retropubic space.[4] Recent meta-analyses of randomized and quasi-randomized controlled trials and prospective studies comparing the retropubic with the transobturator approach suggest they have a similar efficacy in the short term. However, the studies considered were of insufficient quality to permit definitive conclusions to be made about the comparative efficacy and safety of these approaches beyond 12 months.[5–7]

Based on the literature available when the TOMUS (Trial Of Mid Urethral Slings) was designed, we conducted an equivalence trial rather than a superiority or noninferiority trial to more definitively state that the 2 MUS approaches were equivalent. We previously reported 12-month success rates after surgery in the TOMUS.[8] Consistent with the original design of the trial we report success rates, QOL, patient satisfaction, adverse events and other outcomes of this clinical trial 24 months after surgery.

METHODS

We conducted a multicenter, randomized equivalence trial of RMUS and TMUS surgery in women with SUI. Details of the study design have been previously described.[9] Women were eligible for the study if they were seeking surgery for SUI, were 21 years old or older, had symptoms of stress predominant UI and had a positive stress test at a bladder volume of 300 ml or less. Two primary outcomes of surgical success were assessed. Objective success was defined as a negative provocative stress test at a bladder volume of 300 cc or greater, a negative 24-hour pad test and no re-treatment (behavioral, pharmacological or surgical) for SUI. Subjective success was defined as the absence of self-reported symptoms of SUI on the MESA (Medical, Epidemiological and Social Aspects of Aging) questionnaire,[10] no urine leakage on a 3-day voiding diary and no re-treatment for SUI. Secondary outcomes included complications/morbidity, self-report of QOL, symptom bother, satisfaction and global improvement. Quality of life was assessed by the IIQ (Incontinence Impact Questionnaire), with possible scores of 0 to 400, with higher scores indicating a more negative impact on QOL.[11] QOL was also assessed by the ICIQ (International Consultation on Incontinence Questionnaire), with possible scores of 0 to 21, with higher scores indicating a more negative impact.[12] Symptom bother was assessed by the UDI (Urogenital Distress Inventory), with possible scores of 0 to 300, with higher scores indicating greater distress.[11] In addition, participants completed the PGI-I (Patient Global Impression of Improvement), a single item querying overall improvement, ranging from very much better to very much worse.[13] Adverse events, adjudicated by a group of study investigators blinded to the surgical procedure, were classified with a modification of the Dindo system.[14] The study protocol was approved by an institutional review board at each of the participating sites. Written informed consent was obtained from each study participant. An independent data and safety monitoring board reviewed the progress, interim results and safety of the study.

With 250 women with available data in each group, it was calculated that this study would have 80% power to demonstrate equivalence between success rates in the 2 sling approaches (equivalence margin of ± 12 percentage points) at a 2-sided significance level of 5%. The equivalence margin was chosen for clinical considerations (eg even if the 2 treatments differed by as much as 12 percentage points we would still be comfortable considering the 2 arms equivalent) and practical considerations (eg the number of patients suitable to enroll in the trial). Generalized linear modeling, assuming a logit link and binomial distribution, was used to calculate the rates of treatment success. Equivalence for the primary outcome was declared if the entire 95% CI for the difference between the 2 surgical approaches was within the equivalence margin.

Only women who had undergone their assigned surgery (per protocol) were included in the primary outcome analysis. As in the primary TOMUS report, per protocol analyses were used here to analyze the primary outcomes because they provide more conservative estimates when evaluating equivalence compared to intent to treat analyses that may tend to bias toward concluding that the 2 arms are similar.[8,15] We performed a secondary analysis of the primary outcome and analyses of secondary outcomes of women based on randomized assignment (intent