Repeat mid-urethral sling in management of recurrent or persistent stress urinary incontinence

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According to the International Continence Society, stress urinary incontinence (SUI) was defined as involuntary leakage on effort or exertion, or on sneezing or coughing. The prevalence of SUI varies among different age groups and is reportedly 48% (29%–75%).[1] The mid-urethral sling (MUS) procedure is currently considered the gold standard in the surgical treatment of SUI. The long-term cure rate of SUI using MUS ranges from 76.9% to 90.0%. However, incontinence persists in approximately 20% of SUI patients who underwent MUS procedure, and they require further treatment. Persistent SUI was defined as early leakage due to increased intra-abdominal pressure induced by stress events occurring within 6 weeks of the first MUS procedure, whereas recurrent SUI was defined as later leakage occurring more than 6 weeks after the first MUS. Previous studies report that repeat MUSs can achieve outcomes similar to that of initial MUSs.[2,3] However, related studies in the Chinese population were rare. In this retrospective study, we evaluate the efficacy of repeat MUSs based on the degree of improvement of leakage of urine and assess the safety of the procedure based on the incidence of intra-operative and post-operative complications. This study was approved by the Ethical Committee of Peking University People’s Hospital, and waiver of patient informed consent was approved.

Between January 2010 and January 2017, twenty patients with persistent SUI or recurrent SUI underwent repeat MUS procedures in our center. Patients lost to follow-up and patients with concomitant urgent urinary incontinence or pelvic organ prolapse were excluded. A total of 17 patients were included in this retrospective study. Tension-free vaginal tape (TVT) was performed in 14 cases and trans-obturator tape (TOT) in three cases. Pre-operative assessment for repeat MUS included detailed medical history taking, physical examination, voiding diary for 2 to 3 days, urinalysis, urine culture, and multi-channel urodynamic study including uroflowmetry, post-void residual urine measurement, filling and voiding cystometry, and abdominal leakage point pressure (ALPP) measurement. Repeat MUSs were performed under spinal anesthesia by the same experienced surgeon. Patients were discharged on the day following the surgery in the absence of urinary retention, unbearable pain in the thigh, or other complications.

All patients were followed up for 12 to 80 months after the repeat MUS procedures. Subjective cure was defined as the absence of involuntary urine leakage during stressful activities as reported by the patients, and improvement was defined as a significant decrease in urine leakage; other outcomes were regarded as failure. A total of 17 patients underwent repeat MUSs due to persistent SUI (6/17) or recurrent SUI (11/17). The clinical characteristics, outcomes, and complications observed in patients are presented in Table 1. The initial MUS procedures were TOT in 14 cases and TVT in three cases, whereas the repeat MUS procedures were TVT in 14 cases and TOT in three cases. No significant bleeding or bladder perforation occurred intra-operatively, and all 17 patients were able to void after removing the urethral catheter. At a mean follow-up of 37.9 months (range 12–80 months), cure was achieved in 10/17 of patients, improvement in 2/17, and failure in 5/17 patients. De novo urgency after repeat MUS occurred in two patients. There was no occurrence of vaginal erosion, recurrent urinary tract infection, or prolonged urinary retention.

The MUSs were developed to support the mid-urethra for reducing hypermobility based on the “hammock hypothesis” described by DeLancey.[4] The MUSs can reportedly achieve high long-term cure rate and are first-line treatments for SUI in women.[1,2] Unfortunately, incontinence persists in approximately 20% of patients who then require further treatments, which is frustrating for both
patients and surgeons. The widely accepted possible reasons for MUS failures include inappropriate fixation of the sub-urethral tape and the underlying pathology of the urinary incontinence mechanism [3]. In this study, one patient had the initial tape cut due to extreme voiding difficulty because of too much tension on the tape 1 week after the initial surgery, which led to the recurrence of SUI.

In 11 cases with detailed information of urodynamic study, six patients belonged to SUI type III category (ISD, ALPP/C20 = 0.098 kPa) and two patients belonged to type II category (60 cmH2O < ALPP < 90 cmH2O). Therefore, the existence of ISD may be one of the risk factors causing MUS failure.

Potentially, these patients could be treated with peri-urethral bulking agents, readjustment of the loose tape, repeat MUS with or without mesh removal, Burch colposuspension, or artificial urethral sphincter. In recent years, there have been growing evidences showing that repeat MUS is feasible and successful for patients who failed initial MUS. [2,3]

It is now wide-accepted that it is necessary to perform urodynamic study before surgery not only to confirm SUI but also to categorize the subtype based on the maximal urethral closure pressure or ALPP. For patients with ISD, TVT could achieve a significantly higher cure rate than TOT. [2] A possible explanation for the difference is the angle of the tape supporting the mid urethra. The retropubic sling has a “U” shape, which may be more supportive and obstructive than the horizontal orientation of the trans-obturator tape. Therefore, pre-operative assessments are extremely important for choosing the suitable treatment.

Approximately 70% of patients with recurrent SUI or persistent SUI could benefit from repeat MUS. By comparing the outcomes of initial MUSs and repeat MUSs in our center, the cure rate of repeat MUS is lower than that of initial MUS. [3] However, due to the small number of patients included in this study, further research needs to be carried out to analyze whether the difference is statistically significant.

In summary, SUI in women is a common problem worldwide, and MUSs are currently considered the gold standard treatments for SUI. Despite the high cure rate of MUSs, the initial procedures may not be successful in a small proportion of patients. For patients with recurrent or persistent SUI, repeat MUSs could achieve satisfying outcomes with low complication rates.

Conflicts of interest

None.

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