Int Urogynecol J (2007) 18: 23–26
DOI 10.1007/s00192-006-0113-y

ORIGINAL ARTICLE

Alexander Tsivian · Menahem Neuman · Evgeny Yulish · Avraham Shtricker · Samuel Levin · Shmuel Cytron · A. Ami Sidi

Redo midurethral synthetic sling for female stress urinary incontinence

Received: 2 November 2005 / Accepted: 8 March 2006 / Published online: 1 April 2006

Abstract Tension-free transvaginal tape (TVT) placement has recently become the preferred therapeutic approach for female stress urinary incontinence (SUI) in some centers. There are, however, no clearcut guidelines of how to treat patients in whom the procedure has failed. We describe our experience with repeat midurethral synthetic sling (MUS) implantation after a failed similar procedure. Twelve women (mean age 64.3 years) who had undergone a MUS procedure [TVT—9, intravaginal sling (IVS)—2, transobturator tape (TOT)—1] for SUI underwent a repeat MUS (TVT—5, IVS—4, TOT—3) due to persistent or recurrent SUI. The time from the first to the second procedure was 1–48 months. Eleven out of 12 patients (91.7%) achieved full continence (mean follow-up of 23.2 months, range 14–44). We conclude that a repeat MUS for persistent or recurrent SUI is a viable option for patients after an unsuccessful MUS procedure.

Keywords Stress urinary incontinence · TVT · Redo antiincontinence procedure

A. Tsivian (✉) · A. Shtricker · S. Levin · A. A. Sidi
Department of Urologic Surgery,
The Edith Wolfson Medical Center, Holon,
Sackler Faculty of Medicine, Tel Aviv University,
Tel Aviv, Israel
e-mail: atsivian@hotmail.com
Tel.: +972-3-5028653
Fax: +972-3-5028199

M. Neuman
Urogynecology, Department of Gynecology,
Shaare-Zedek Medical Center,
Ben Gurion University of the Negev,
Jerusalem, Israel

E. Yulish · S. Cytron
Department of Urology, Barzilai Medical Center,
Ben Gurion University of the Negev,
Ashkelon, Israel

Introduction

Tension-free transvaginal tape (TVT) placement has become the preferred treatment for female stress urinary incontinence (SUI) in many centers. After the report of Ulmsten et al. [1] on the TVT procedure, some analogous procedures, such as an intravaginal sling (IVS) [2], a transobturator tape (TOT) [3], and others have been described, and they comprise a group of antiincontinence procedures known as midurethral synthetic slings (MUS). The long-term success of MUS has been reported as being between 78.9–84.7% [4, 5] with complications such as obstructed urethra and erosions of the bladder, urethra, or vagina [6, 7]. It is not clear what should be done for patients in whom the TVT procedure has failed. Several possible treatment options after failed sling procedures have been described in the literature, and they include abdominal surgery [8, 9], an additional sling [10], periurethral injection of bulking agents [11], or artificial sphincter placement [12]. There are scarce reports on repeat TVT procedures, and the efficacy of a repeat midurethral sling (MUS) has not been established. We describe our experience with treating our SUI patients by means of repeat MUS implantation after they had undergone a previous failed MUS procedure.

Materials and methods

Patients

Twelve women (mean age 64.3 years, range 47–80) underwent repeat MUS for SUI in our departments. Preoperative evaluation included a medical history, physical examination, urinalysis, urine culture, a urodynamic study and cystoscopy. The physical exam consisted of a pelvic examination with stress (in the supine and standing positions), and Bonney and Q-tip tests. The urodynamic study included filling cystometry with cough provocation and uroflowmetry. The reasons for repeat MUS were persistent SUI in four cases and recurrent SUI in eight

(Table 1). One patient underwent tape incision for an obstructed urethra 36 months after the primary TVT procedure; after which, urinary incontinence had recurred 3 months postoperatively. Another patient underwent unsuccessful readjustment (plication) of the tape 3 months after a primary TOT procedure. Four women had fixed urethra and the other eight had mobile urethra before the repeat MUS. The Valsalva leak point pressure (VLPP) level was <60 cm H_2O in four women: of note, the VLPP before the first operation was 50, 40, and 50 cm H_2O in the latter three of these patients (there were no preoperative VLPP data for one patient). The physical examination demonstrated urinary leak, which was not detected during urodynamic study in two patients.

Methods

With the patients under either spinal or general anesthesia, a 2-cm anterior colpotomy was performed through the vaginal scar of the first MUS and the suburethral area was dissected with minimal lateral dissection. In some cases, an attempt was made to identify the mesh, and its condition was recorded when it was found. A new TVT placement was performed using the classic technique [1], but without the cough test, and the IVS procedure was performed according to Petros [2]. The TOT procedure was performed as described by Delorme [3]: a skin incision was made in the genitofemoral fold at the level of the clitoris and the tape was inserted through the obturator foramen underneath the urethra, after which the vaginal wall was reapproximated with a running Vicryl 2/0 suture. A urethral catheter was left overnight in each case.

The follow-up protocol included the patient's visit at postoperative months 1, 3, 6, and 12, as well as a telephone survey using the UDI-6 short-form [13]. The criteria for therapeutic success was (1) complete continence, (2) freedom from the need for pad protection, and (3) ability to urinate naturally; any other results would have been classified as failures.

Results

The interval between the first and second MUS procedure was 1–48 months (average 21.4). All 12 women were available for follow-up for a mean period of 23.2 months (range 14–44). During the second surgery, the tape was not found in three women, and it was seen to be embedded and palpable in another one, so no attempt was made to uncover it. The new tape was placed just proximally to the old one that had been found to be in good condition and in the correct location in two cases. In one patient, the tape had assumed a string-like rolled shape, and this tape was partially removed. The condition of the tape was not recorded in five cases. Eleven out 12 (91.7%) women are continent after corrective surgery. Three women suffered from urgency and required anticholinergic therapy.

Discussion

Many different ways of performing a suburethral sling have been recently developed for the treatment of SUI. Each of them was designed primarily to decrease the complexity of the traditional slings. The new antiincontinence procedures, MUS, provide the same mechanism of continence according to the theory of De Lancey [14]: intermittent closing of the middle part of the urethra during the increasing of intraabdominal pressure. Although some centers have reported excellent outcomes with the TVT procedure [4, 5], failures have been reported as well [4–7].

Table 1 Patient information

Patient number	Age (years)	Type of first surgery	Reason for repeat surgery	Time from first to second MUS (months)	VLPP before second surgery (cm H_2O)	Type of repeat surgery	Follow-up (months)	Complications/ failure
1	75	TVT	Persistent SUI	1	80	TVT	35	–
2	47	TVT	Recurrent SUI	24	75	TVT	23	–
3	65	TVT	Recurrent SUI	46	45	TOT	19	–
4	53	TVT	Persistent SUI and vaginal erosion	48	71	TVT	28	Urgency
5	80	TVT	Persistent SUI	17	No leak	TVT	44	–
6	78	TVT	Recurrent SUI	36	70	TVT	16	–
7	78	TVT	Recurrent SUI	14	No leak	TOT	19	–
8	53	TOT	Persistent SUI	4	56	TOT	14	Persistent SUI
9	74	TVT	Recurrent SUI	14	80	IVS	27	Urgency
10	53	TVT	Recurrent SUI	14	30	IVS	21	De novo urgency
11	49	IVS	Recurrent SUI	8	70	IVS	17	
12	67	IVS	Recurrent SUI	9	40	IVS	15	

TVT tension-free vaginal tape, *TOT* transobturator tape, *IVS* intravaginal sling, *MUS* midurethral sling, *SUI* stress urinary incontinence, *VLPP* Valsalva leak point pressure

The etiology of persistent SUI after surgery is unclear, but it may be related to intraoperative adjustment of the tape, failure of the tape to be fixed in place, or the underlying pathology of the urinary incontinence mechanism [15]. A possible etiology of delayed failure (recurrent SUI) awaits clarification.

The options that are available after failure of a sling procedure are abdominal surgery, repeat sling, periurethral injection of bulking agents, or artificial urinary sphincter placement. Nitahara et al. [8] evaluated the long-term outcome of abdominal colpocystourethropexy for the treatment of persistent or recurrent SUI after multiple vaginal or abdominal repairs. They found that the additional surgery was successful in two-thirds of the women with persistent SUI, but that the results were less satisfactory among women with recurrent SUI. According to the data of Amaye-Obu and Drutz [9], the cure rate for Burch procedures that were carried out after one failed previous procedure was 81%, but it dropped to 25% when done after two previous surgeries and 0% after three previous procedures. They concluded that the Burch procedure should be avoided after >1 previous operation.

Repeat suburethral sling procedures have been reported to be associated with good clinical results [9]. Petrou and Frank [10] retrospectively reviewed the records of 14 patients in whom an initial suburethral (autologous fascia, cadaveric fascia, and vaginal patch) sling procedure had failed and who subsequently underwent a repeat autologous pubovaginal sling procedure. Seven of the 14 patients (50%) were cured (mean follow-up after reoperation 17 months, range 5–41). Subjectively, 12 of these 14 women (86%) considered themselves cured or improved. The authors concluded that a repeat pubovaginal sling procedure after an initial failed operation is associated with low complication and acceptable continence rates, and that it should be considered a reasonable treatment option in select women with recurrent SUI [10].

The advantages of the technique using bulking agents are that it is associated with low morbidity and does not preclude the use of a sling if it fails, but an ideal agent that is durable, easy to use, and has long-term success is not yet available [11]. Elliott and Barrett tried using an artificial sphincter and stated that it can be a suitable treatment option in only a highly selected female patient group, with a five-year expected product survival of 72% [12].

There are scarce data on the management of failures after the TVT procedure. Riachi et al. [15] described the first such cases, reporting successful repeat application of a TVT after a primary failure in two patients with recurrent SUI who had been reoperated at 6 and 9 months after the initial TVT procedure. The previously placed TVT sling was not identified in one case. Both women were completely continent at the 6- and 13-month follow-up. In the series of Hong et al. [16], four patients underwent sling release or incision due to an obstructed urethra after the TVT procedure. The second TVT procedure was performed at a later stage in three of them because the recurrent SUI yielded excellent surgical results. Villet et al. [17] reported three women with recurrent or persistent SUI after a primary TVT procedure who were treated by a second TVT or by retensioning of the previously placed mesh. A second-look operation was performed 7 months after the primary surgery in one case: the mesh, which was too loose and excessively close to the urethral meatus, was sutured onto the midline using a 4/0 polypropylene suture to retension it. In the other two cases, a second-look operation was performed after 8 and 18 months of follow-up. The previously placed mesh was not located, even after extensive dissection of the paraurethral tissues on both sides in one of them. In the other, the mesh was found in a relatively good position and state of tension. A new TVT procedure was performed using the classic technique: all three patients were continent and local healing was excellent at 4–24 months of follow-up [17]. Paick et al. [18] reported two cases of recurrent incontinence after the TVT procedure, which were treated by tape shortening. The second surgery, performed 6 months after the primary procedure, involved only loosely shortening the tape, without elevation, around the urethra, and application of two medium-sized clips to the folded tape. Neuman [19] reported four patients who had requested to be operated after operative failure had been diagnosed. They were treated by transvaginal readjustment of the tape and three of them reported subjective continence.

In our series, 12 women underwent repeat MUS, four for persistent SUI, and eight for recurrent SUI. Five of them underwent repeat TVT, four underwent IVS, and three underwent TOT placement. Although, the numbers are small and the follow-up is short, the successful outcome warrants consideration of this procedure for women seeking help after failed MUS. Eleven of the 12 are continent after the corrective surgery. Repeat surgery in three out of four cases with urodynamically proven intrinsic sphincter deficiency was successful, similar to the results of Rezapour et al. [20].

In spite of the development of new technologies and methods for SUI treatment, the old enigma has remained unresolved: how tightly or how loosely should we place the sling beneath the urethra? This continues to be the long-standing “Achilles heel” of antiincontinence surgery.

In our opinion, the failure of MUS is a result, at least in part, of a technical error (too loose tape placement). After a failed TVT procedure, possible salvage options (in addition to the generally accepted ones, mentioned above) include readjustment (plication, shortening, or retensioning) of the existing tape or repeat midurethral sling. We suggest that tape readjustment may be used in cases where the old tape is found to be in good condition and location. However, in view of our limited experience with tape readjustment, we currently prefer repeat midurethral sling procedure in which we achieved good results. The mechanisms of action of the MUS procedures (TVT, IVS, and TOT) are the same. The only difference is the material of the sling and technique of tape insertion, and, the choice of procedure is only a matter of the surgeon’s preference: indeed, the surgeons of our three centers preferred different surgical techniques. As to the timing of the repeat procedure, we do not see any reason—with the exception of local inflam-

mation—to delay the corrective surgery once failure has been diagnosed.

Conclusions

A repeat midurethral synthetic sling procedure for persistent or recurrent stress urinary incontinence is a viable option for patients in whom the initial procedure has failed.

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