

TAPE FIXATION – AN IMPORTANT SURGICAL STEP TO IMPROVE SURGICAL SUCCESS RATE OF ANTI-INCONTINENCE SURGERY.

Hypothesis / aims of study

Midurethral synthetic slings (MUS) since introduction into clinical practice (in 1995 - retropubic and in 2002 - transobturator) nowadays are preferred therapeutic approaches for the treatment of female stress urinary incontinence (SUI). Both type of slings are considered as a minimally invasive yet effective surgical method for the management of SUI. Almost all recently published MUS surgical results show a high success rate ranging from 80-95% with greater than five year follow-up [1]. However still 5 to 20% of operated patients experience surgical failure with clinically significant recurrent or persistent SUI [2]. The etiology of persistent or recurrent SUI following MUS is not precisely defined. Some theorize that the initial placement of the tape was too loose or positioned incorrectly, thereby preventing functional urethral kinking to occur during periods of increased abdominal pressure. On the other hand Kociszewski et al. showed that when a TVT lays between the 50th and 80th percentile of the urethral length (measured from the bladder neck), the cure rate exceeds 90%, whereas location outside this zone is associated with treatment failure in more than one-third of patients [3]. Additionally for proper functioning, the tape should remain at a certain distance from the urethral lumen (no greater than 5 mm and no shorter than 3 mm). Our own unpublished observations indicate that almost all failures of TOT procedures seen shortly after surgery are associated with placement of the tape too close to the bladder neck. Therefore the aim of our study was to elucidate if additional midurethral tape fixation preventing its displacement towards the bladder neck during tensioning could increase the surgical success rate among SUI patients.

Study design, materials and methods

The study was conducted from January 2007 to January 2009 on a group of 372 (group I – 197 patients treated with standard transobturator IVS 04M procedure and group II - 175 patients treated with IVS 04M procedure with additional 2 point tape fixation – Fig. 1). Incontinent women who underwent urodynamic work-up and surgical treatment of SUI, signed informed consent and fulfilled the inclusion criteria. The demographic data are shown in Table I. The follow-up visits were scheduled for 1, 6 and 12 months after the surgery. The efficacy of both procedures was assessed by gynecologic examination and cough test in the supine and standing positions with a comfortably full bladder. Patients were considered completely cured when they were free of all SUI symptoms and cough tests in the supine and standing positions were negative. Moreover, the completely cured patients reported that the use of hygienic pads was not necessary. The operation was considered as a failure if the patient still reported urine leakage during increases of intra-abdominal pressure, the cough test with a comfortably full bladder was positive or the woman had to use pads because of being wet during the day. In the improvement group the cough test was negative but patients still experienced stress urinary leakage (much less frequent than previously) and the pads were occasionally wet. Statistical analysis was performed using Statistica package version 7.1 (StatSoft, Poland). When comparing two independent groups Chi square (χ^2) test was used and p value <0.05 was considered as statistically significant.

Results

As shown in Table I both groups did not differ in terms of demographic and urodynamic data however the clinical outcome of both procedures among investigated group after 12 months was significantly different. The groups did not differ according to Valsalva Leak Point Pressure (VLPP) parameter. In group I low pressure urethra was found in 18.6% and in group II 18.7% ($\chi^2 = 0.0$, $p = 0.99$). In group I 174 (88.3%) out of 197 were cured whereas in group II 165 (94.3%) out of 175 were free of SUI symptoms ($\chi^2=3.95$; $p=0.047$). This finding clearly indicates that proper positioning of the tape plays critical role in continence mechanism after MUS placement.

Table I. The demographic data of study groups.

	IVS 04	IVS 04 + Fixation	<i>p value</i>
n	197	175	
Age (years)	55,8	54,9	0,47
Parity (number)	2,6	2,6	0,82
BMI (kg/m ²)	28,9	28,9	0,98

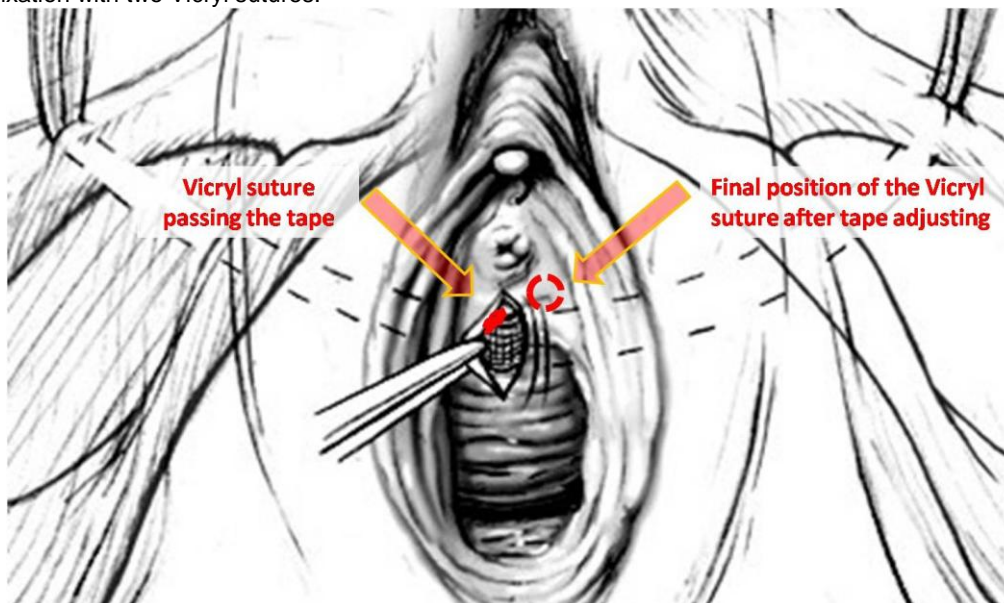
Interpretation of results

Proper functioning of continence mechanisms depends on several extrinsic and intrinsic factors. According to the current concepts, appropriate support of the urethra is crucial for female urinary continence. Although other continence mechanisms such as contraction of the urethral sphincter and the “seal” provided by the urothelium and the submucosal vascular plexus play significant roles. It appears that reinforcement of the pubourethral ligaments and the suburethral hammock by implantation of a non-absorbable tape under the midurethra is a highly effective way to surgically restore continence. The main mechanism of retropubic sling action relies on the angulation of the urethra on a fulcrum created by the tape. This was elucidated largely by means of real-time ultrasound. Several ultrasound studies have shown that dynamic kinking and “knee angle” formation by the urethra is present in approximately 90% of cured patients after MUS placement. From the theoretical point of view, placement of a tape precisely under the middle section of the urethra is essential for surgery to be effective. As there is no definitive intraoperative method of ensuring that the tape is positioned correctly, general principles such as mid-urethral tape location, creation of an adequate angle between the tape arms, and tension-free placement, should be kept in mind while performing the sling procedure. Our modification of transobturator sling placement enables precise positioning of the tape between 30th and 50th percentile of urethral length without any danger of tape displacement during tensioning which may occur in patients with anatomical abnormalities within the bony pelvis and when technical error during tape placement occurred.

Concluding message

Additional tape fixation with two paraurethral absorbable Vicryl sutures prevents its slippage towards bladder neck and significantly increase the clinical success rate among patients operated due to SUI.

Figure 1. Tape fixation with two Vicryl sutures.



Two additional Vicryl No 1 suture were placed parallel to the urethra (0.5 cm laterally on both sides of the urethra) between 1.0-1.5 cm from external urethral meatus. These two sutures fixed the tape close to urethral wall and prevent tape displacement during final tape tensioning.

References

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Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes