

Transobturator-tape outside in (TVT-O) as saviour for female stress urinary incontinence without available cystoscope for gynecologist: A case series

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Abstract

SUI affects quality of life. Ulmsten and Petros reported mid urethral sling operations using Tension-free Vaginal Tape (TVT) and Delorme used Transobturator Tape (TOT). Cystoscopy is often used in retropubic sling procedures to identify lower urinary tract injury. Cystoscopy protects patients and accurately identifies iatrogenic injuries. The goal is to evaluate the efficacy of a standard Trans-Obturator (TOT-O) mid urethral sling for female Stress Urinary Incontinence (SUI) without intraoperative cystoscopy. A total of 120 female SUI patients from 2014 to 2019 were studied. Stress-related incontinence and diaper use were preoperative variables. Under spinal anesthesia, the procedure improved stress incontinence, sexual dysfunction, complications, and overall satisfaction. All patients improved after the procedure, and 116 (96.6%) completely resolved. Post-operative complications included urinary retention in 3 patients (2.5%), increased daytime urinary frequency in 3 (2.5%), urge incontinence in 4 (3.33%), groin/thigh pain in 2 (1.66%), and local mesh excision for mesh erosion in 1 (0.83%). Open EPI software calculated insignificant p values for clinical profile and satisfaction with symptom resolution. Brief Index of SF for Women was used to assess sexual function. At 6-month follow-up, all patients were satisfied with sexual function. TOT-O technique for female stress urinary incontinence is easy to learn and reproducible for beginners.

Introduction

Stress urinary incontinence is a disease

that has a direct impact on one's quality of life. The mid urethral sling operations as retropubic Tension-free Vaginal Tape (TVT) was reported by Ulmsten and Petros¹ and the Transobturator Tape (TOT) by Delorme.² Age, BMI, and menopause are all risk factors for stress urinary incontinence, which is also linked to the number of children born and lifestyle.³ Cystoscopy is frequently used during sling surgery to detect lower urinary tract injury, with a focus on retropubic sling procedures. Cystoscopy ensures patient safety and is extremely effective in detecting iatrogenic injuries. The International Continence Society defines SUI as the complaint of involuntary urine leakage with effort, exertion, sneezing, or coughing caused by urethral hypermobility and functional urethral sphincter insufficiency.⁴ These midurethral sling operations became the most popular and saw an exponential increase in cases. This operation's materials and technique are still evolving.⁵ The midurethral sling, in theory, involves a suburethral support mechanism.^{6,7} Under stress, these procedures cause dynamic urethral compression.⁵ Failure rates for transobturator procedures are as low as 5.7% and 7.8% for retropubic procedures. Transobturator procedures have a perioperative complication rate of 0.8%, while retropubic procedures have a complication rate of 5.5%.⁸

Materials and Methods

The study included 120 female stress urinary incontinence patients treated at various institutions between 2014 and 2019. A detailed history was taken, as well as baseline investigations such as a complete blood count, kidney function test, liver function test, urine examination, and urine culture. A lying-down stress test (Bonney's test) was performed to check for urine leakage. Additionally, the patient's subjective feeling of urine leakage during stress maneuvers with daily diaper use was taken into account. All of the patients in our study passed the stress test. In some cases, lower urinary tract imaging and urodynamic evaluation were performed (especially in those patients with predominant urge incontinence and doubtful history). Patients with concomitant pelvic organ prolapse^{9,10} and those with documented detrusor overactivity on urodynamics were excluded from the study. Because many patients were afraid of the procedure under local anesthesia, all patients underwent it under spinal anesthesia. On the first post-operative day, the urethral catheter was removed, and the patients were assessed for continence and counseled

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Availability of data and materials: All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate: This study received the ethics approval (IEC U 42). The study is conformed with the Helsinki Declaration of 1964, as revised in 2013, concerning human and animal rights. All patients participating in this study signed a written informed consent form for participating in this study.

Informed consent: Written informed consent was obtained from a legally authorized representative(s) for anonymized patient information to be published in this article.

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accordingly. By performing a stress test, the post-procedure results were evaluated in terms of improvement/resolution of stress incontinence (standing posture). Pain was evaluated using a visual analogue scale, as was any other complication and overall satisfaction with urinary continence. Follow-up evaluations were performed at 1, 3, 6, and 12 months after surgery. On each follow-up visit, questions about urinary continence improvement, post-operative pain, and sexual dysfunction were asked.^{10,11} At the one-month follow-up, all patients had uroflometry and ultrasonography for residual urine.

Surgical technique

All of the procedures were carried out under spinal anaesthesia. The patient was positioned for dorsal lithotomy. The lower abdomen and genitalia were prepped with diluted savlon and betadine and sterilely wrapped. A 16 fr Foley's catheter was placed per urethra, and the mid urethra was located. As with standard TOT, the safe entry point for the TOT needle is the intersection of a perpendicular line from the insertion of the adductor longus and a horizontal line from the tip of the clitoris. The points where these lines intersect correspond to the entry of the TOT needle. The anterior vaginal wall was grasped with an Allis clamp, and a 2 cm vertical incision was made just 1 cm proximal to the external urethral meatus. Following hydrodissection, a suburethral tunnel was created in the anterior vaginal wall. The index finger is used to feel the ischiopubic ramus. Dissection in the vesicovaginal space is the first step in standard TOT surgery. This dissection is done lateral to the urethra until the inferior border of the ischiopubic rami and pubic symphysis can be palpated easily. A trocar must normally traverse the obturator internus muscle, obturator membrane, and obturator externus muscle as it passes through the obturator foramen in a standard TOT-O procedure. The thigh adductor muscles (gracilis and adductor brevis) are located lateral to the obturator foramen.^{12,13} The tip of the TOT needle is inserted through the incision in the vaginal wall, and a thread of one end of synthetic mesh is threaded through the eye of the TOT needle, and the needle is withdrawn through the same path superficial to the ischiopubic rami to the original incision in the groin. The procedure is repeated on the other side. In our study, we used a 2 x 39.8 cm non absorbable undyed monofilament polypropylene mesh sling. The sling was adjusted with a scissor so that it rested comfortably under the mid-urethra. Because the procedures were done under spinal anaesthesia, the patients were instructed to strain by coughing after filling the bladder with 300 mL saline to see if the sling tightness needed to be adjusted. Both ends of the sling are cut beneath the groin incision. Vicryl 4-0 suture was used to close the anterior vaginal wall incision. Sterile dressings are applied to groin skin incisions. Gauze soaked in betadine was kept in the vagina.

Post operative care

On the third postoperative day, the Foley's catheter and betadine-soaked gauze were removed. After catheter removal, patients were instructed to urinate spontaneously and to use betadine vaginal pes-

saries for one week. On the same day, all patients were discharged with post-void residual urine estimation. Before being discharged, patients who were unable to urinate or had post-void residual urine of more than 100 mL were taught self Clean Intermittent Catheterization (CIC). After being discharged from the hospital, patients were advised to resume normal daily routine activities, maintain local hygiene, avoid straining and lifting heavy weights for 3-4 weeks, and refrain from sexual activity for 4-6 weeks. Patients who had prior urgency were advised to take anticholinergics for three months after surgery.

Results

The patients' average age was 43.5 years (Table 1). All of the patients were multiparous. The average operative time was 34 minutes (30-45 min) Symptomatic improvement (Table 2) was observed in all patients following the procedure, with complete resolution of symptoms (subjective and objective improvement) in 114 patients (96.96%). The stress test on lying down and standing posture was used to assess objective improvement.

At 3 months after the procedure, post-operative complications (Table 2) included urinary retention in 3 (2.5%) patients, increased daytime frequency of urination in 3 (2.5%) patients, urge incontinence in 4 (3.3%) patients, and groin/thigh pain in 2 (1.66%), mesh erosion in 1 (0.83%). Oral analgesics were used to treat post-operative groin/thigh pain, and mesh erosion that persisted after the application of local estrogen cream was excised under local anesthesia. None of the patients we treated developed de novo urge incontinence. Patients with preoperative urge incontinence, on the other hand, were treated with oral anticholinergic medications in the postoperative period for two to three months until it resolved.

The results (p value and Chi Square test) for the clinical profile of the patients and satisfaction with the complete resolution of stress urinary incontinence were insignificant when calculated using Open EPI software, and sexual function was assessed using the Brief Index of SF for Women questionnaire. At 6 months of follow-up, all patients were satisfied with their

sexual function. In total, 96.66% of patients were pleased with the procedure.

Discussion

The female urethra is located beneath the pubic symphysis, and pubourethral ligaments connect the anterior urethral wall to the pubic arch. In the case of valsalva or stress maneuvers, the posterior urethral wall slides away from the anterior urethral wall, opening the bladder neck and proximal urethra and resulting in stress urinary incontinence. Urethral slings are the current surgical treatment of choice for female stress urinary incontinence. Sling placement has been attempted using a variety of materials and techniques. Unlike pubovaginal slings, midurethral slings are loosely placed at the midportion of the urethra. Iatrogenic lower urinary tract injury/bladder injury varied by stress urinary incontinence procedure; the retropubic mid urethral sling procedure had the highest rate of bladder injuries. When compared to transvaginal tape procedures, the transobturator route outside in technique avoids blind entry into the retropubic space and should carry a lower risk of bladder or lower urinary tract injuries. Currently, a soft, loosely woven, polypropylene monofilament mesh with pore sizes greater than 75 micrometers is used, allowing macrophage passage and excellent host tissue ingrowth, promoting organized fibrosis and reinforcing the sphincteric mechanism through improved urethral support and thus improving continence. In our study, the majority of patients were between the ages of 35 and 45, and the most common symptom was stress urinary incontinence with bothersome symptoms associated with low self-esteem. At a 12-month interval, the majority of patients were satisfied. Symptomatic improvement was seen in all patients following the procedure, with complete resolution of symptoms in 32 patients (96.66%), with results comparable to Tincello *et al.*'s study¹⁴ with a continence rate of 87.2% at a 12-month follow-up. Wang *et al.*¹⁵ compared three mid urethral Tension-free Tapes (TVT,TVT-O, and TVT-Secur) in the treatment of female stress urinary incontinence and concluded that TVT-O is easier to use and safer than other mid urethral tension free tapes. Due to a lack of

Table 1. Clinical profile of the patient (n=33).

Age in years		Symptomatology
25-35 years	10	Predominant stress incontinence
35-45	90	Predominant stress incontinence
45	20	Predominant stress incontinence associated with urge incontinence

Table 2. Results of the study (n=120).

Satisfaction		Intraoperative complications	Post operative complications
Satisfactory with complete resolution of SUI	116 (96.96%)	Nil	Mesh Perforation - Nil Mesh Erosion -1 (0.83%)
Unsatisfactory with partial resolution of SUI	4 (3.33%)	Nil	Need for continuous - Nil indwelling catheterization Mesh Incision - Nil

**Figure 1. Showing mesh exposure (black arrow) after TVT-O procedure.**

availability, no intraoperative cystoscope was used in our study. On follow-up, none of the patients in our study had any iatrogenic lower urinary tract injuries. Depending on the procedure, reported rates of iatrogenic lower urinary tract injury during incontinence procedures range from 0-7%.¹⁶⁻¹⁹ Because all patients in our study had an indwelling catheter for continuous drainage during the procedure and the TOT needle was brought outside in and entered through the obturator membrane, the chances of bladder/lower urinary tract injury were reduced. On follow-up with recurrent polyuria and bothersome vaginal discharge, only one patient in our study had mesh erosion (Figure 1). The patient underwent local excision of the mesh as well as complete epithelization of the defect. Functional success was defined as the resolution of stress incontinence and patient satisfaction. If conservative treatment does not relieve persistent groin/thigh pain, patients can be treated for removal. Based on our findings, we believe that intraoperative cystoscopy should be avoided during trocar placement. Our study's limitations include a

small sample size and the need for additional research to avoid intraoperative cystoscopy for any iatrogenic bladder injury during the TVT-O procedure.

Conclusions

TVT-O technique as standard procedure for female stress urinary incontinence can be safely done without available cystoscope for gynecologist, is easy to learn and reproducible for beginners, and results in the resolution of bothersome stress urinary incontinence.

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