Transobturator tension free vaginal tapes: Are they the way forward in the surgical treatment of urodynamic stress incontinence?

M. Abdel-fattah*, I. Ramsay

Urogynaecology Unit, Southern General Hospital, South Glasgow University Hospitals, 1345 Govan Road, Glasgow G51 4TF, UK

Objectives: The transobturator approach for sub-urethral tension free vaginal tapes had gained wide popularity in surgical treatment of urodynamic stress incontinence over the last few years. This study aims to survey the practice and preferences of urogynaecologists and urologists worldwide as regards the transobturator tapes.

Material and methods: Seven hundred and twenty surgeons worldwide were surveyed via postal/email questionnaire about their views and practice regarding the transobturator tape procedures (TOTs). They were asked about their technique and tape material preference and their reasons for choosing them. They were also asked about every detail of the procedure.

Results: Adjusted response rate was 68%. Of the responding surgeons, 97% were well aware of the TOTs and only 44.3% undertake them. While 34.16% of the surgeons thought that TOTs are the way forward in the treatment of USI, 14.84% surgeons disagreed and the majority (51%) are yet to decide. With regards to technique of TOTs, most surgeons (38%) would prefer to use both techniques, while 34% use ”In-Out” technique only and 28% use ”Out-In” technique only. The vast majority (72%) use polypropylene mesh tapes due to better tissue incorporation and proven safety records. A few surgeons deviate from the originally described TOTs; 13.6% use a catheter guide to deviate the bladder and urethra during the trochar insertion and 31.41% use routine cystoscopy as part of the procedure.

Conclusion: Whilst one-third of the responding surgeons think that the transobturator approach for tension free vaginal tapes is the way forward for the management of USI, the majority are awaiting studies with longer-term results. The variation from the originally described TOT procedures seems to be inherited from the TVT™ procedure.

* Corresponding author. Tel.: +44 01412012818. E-mail address: msakr99@aol.com (M. Abdel-fattah).


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Introduction

Sub-urethral sling procedures have been used for the treatment of urinary incontinence in women since the beginning of the 20th century.¹ Prior to 1990, slings were not generally used as a first line-treatment; however, the advent of tension free vaginal tape — TVT™ — procedure² has revolutionised the treatment of urodynamic stress incontinence (USI) and reinstated the interest in sub-urethral slings. TVT™ had been originally described as a minimal invasive procedure that can be done under local anaesthesia and sedation with minimal hospital stay and minimal operative/postoperative morbidity. Evidence of high efficacy from an early case series led to a wide spread take-up of TVT™ and an estimated 700,000 patients have been treated with this procedure worldwide.³ There are, however, concerns over the safety of the TVT™, most of which are related to the penetration of the retro-pubic space, with damage to bladder,⁴ bowel,⁵ major blood vessels⁶,⁷ and the ilioinguinal nerve⁸ all having been described.

Whilst wishing to avoid these complications, yet keeping the principle of a minimally invasive procedure to reinforce the structures supporting the urethra, Delorme in 2001⁹ described the transobturator tape. In this technique, a 2-cm incision is made through the vagina over the mid-urethra and a bilateral para-urethral tunnel created out to the obturator foramen on either side. A trochar is then passed from the genito-femoral fold at the level of the clitoris, through the obturator foramen from outside to in and brought round through the vaginal incision. A multi-filament micro-porous tape is then fed through the trochar and brought through the obturator foramen. The procedure is repeated on the contra lateral side and the tape left under no tension under the urethra. In 2003, De Leval¹⁰ described a modification to the surgical technique, which allows the passage of a trochar and tape from inside to out. Several small studies have shown similar short term success rate to TVT™ with lower surgical morbidity rates,¹¹,¹² however, the long-term safety of this type of procedure is not known.

This study aims to explore the views and practice of Urologists, Urogynaecologists and Gynaecologists (with special interest in Urogynaecology) undertaking sub-urethral vaginal tape procedures for the management of urodynamic stress incontinence (USI), regarding what they think is the best surgical approach, best tape material, and their specific surgical technique.

Materials and methods

This is a survey based study; questionnaires were sent to 720 surgeons worldwide, randomly selected from the members of both International Continence Society (ICS) and International Urogynaecology Association (IUGA). More than 2000 surgeons worldwide are currently on the register of both ICS and IUGA; the questionnaires and covering letter were sent by post and/or email. This is a self-designed anonymous questionnaire, where respondents were asked to identify themselves as gynaecologists or urologists and the type of institution in which they worked. They were asked if they carry out TVT™ procedures and whether they think that transobturator tension free vaginal tapes (TOTs) are the way forward in surgical treatment of USI and to justify their answer.

Those who carried out TOTs were asked about their level of experience, expressed by the number of procedures performed annually. They were then asked about the technique and the tape they prefer and to justify their answer. The questionnaire then went on to explore every detail of the TOT surgical procedure including the pre- and postoperative management (Appendix 1).

Results

Four hundred and thirty-three replies were received (response rate 60%). The response rate was adjusted to 68% after excluding 83 wrong email addresses. This included 2 replies from surgeons who did not perform sub-urethral tape procedures leaving 431 replies for analysis, which included a good representation of gynaecologists, urologists, general hospitals, teaching/University hospitals and tertiary referral centres (Table 1). More than two-thirds of the surgeons in this survey (n = 308, 71.46%) stated that they carry out TVT™ procedures, 64 surgeons (14.84%) rarely carry out TVT™ and 59 surgeons (13.7%) have stopped doing TVT™ at all.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Demography of the responding surgeons</th>
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<td>n = 431</td>
<td>%</td>
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<td>Gynaecologist</td>
<td>358</td>
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<td>Urologist</td>
<td>73</td>
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<td>DGH</td>
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<td>Teaching/University Hospital</td>
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<td>Regional Referral Centre</td>
<td>46</td>
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<td>Others</td>
<td>8</td>
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One-third of the responding surgeons ($n = 148, 34.16\%$) thought that TOTs are the way forward in the treatment of USI, 64 surgeons (14.84\%) disagreed, whilst the majority, 219 surgeons (51\%) had yet to decide (Fig. 1).

More than half of the responding surgeons did not carry out TOTs ($n = 240, 55.7\%$) and their main reasons are shown in Fig. 2. One hundred and ninety-one surgeons (44.3\%) stated that they perform TOTs for the management of USI and their main reasons are shown in Fig. 3. These surgeons were then asked about their experience with TOTs; the majority ($n = 103, 54\%$) perform 50–100 procedures per annum, while 64 surgeons (33.5\%) perform <50/year and the rest ($n = 24, 12.5\%$) carry out >100/year.

The surgeons where divided regarding their technique and tape material preference (Figs. 4 and 5, respectively) and the main reasons for their preference are shown in Figs. 6 and 7, respectively.

The vast majority of the surgeons ($n = 190, 99.5\%$) carry out pre-operative urodynamic studies. The majority of the surgeons ($n = 160, 84\%$) carry out TOTs in day surgery units compared to 100 (52.3\%) surgeons who perform the procedure as inpatients. Three surgeons (1.6\%) carried out TOTs in the outpatient department. Most surgeons ($n = 148, 77.5\%$) use general anaesthesia, compared with 92 (48\%) surgeons who use a regional block, 63 surgeons (33\%) use local anaesthesia and sedation, and 15 surgeons (7.8\%) use local anaesthesia only.

A few surgeons deviate from the originally described procedures, $n = 148, 77.5\%$ use a catheter guide to deviate the bladder and urethra during the trochar insertion and 60 (31.41\%) use routine cystoscopy as part of the procedure. Thirty-two surgeons (16.7\%) use a routine cough stress test and 17 surgeons (9\%) use a dilator to check the urethra at the end of the procedure. The use of a catheter at the completion of the operation was controversial with the majority ($n = 143, 74.9\%$) not employing one routinely, 45 (23.5\%) routinely inserting a urethral catheter and 3 surgeons (1.6\%) routinely using a suprapubic catheter. The majority of the surgeons ($n = 125, 65.4\%$) use a post-void residual bladder volume of <100 ml as acceptable for discharge, 33 (17.3\%) use a residual of between 100 and 200 ml, 21 (11\%) use a voided volume equal to or greater than twice the voided volume, and 12 (6.3\%) use other criteria. Seventy percentage of the surgeons use bladder scan and 7.5% use real time ultrasound to estimate the post-voiding residual urine volume, compared to 22.5% using in–out catheterisation. The majority of the surgeons (82.8\%) follow up on their patients, usually up to 12 weeks.

**Discussion**

Delancey’s theory on pelvic support for the bladder and urethra helps to explain the mechanism of
action of the transobturator tape in the treatment of USI, where the position of the tape is similar to that of the natural hammock supporting the urethra. Unlike the TVT\textsuperscript{TM}, the purely perineal insertion of the transobturator tape minimises the risk of trauma to the internal organs: bladder, intestine, major vessels and nerves. A recent prospective randomised trial had shown TOT to be equally effective to TVT\textsuperscript{TM} in the management of USI with less operative morbidity.\textsuperscript{14} TOT has also been recently described for the treatment of USI in men.\textsuperscript{15} The relatively easy and safe insertion techniques and the low peri-operative morbidity described in the short to intermediate follow-up trials\textsuperscript{11,12} have led to the increasing popularity of the transobturator sub-urethral tapes in the treatment of USI. Therefore, it was important to explore the thoughts of different surgeons dealing with these types of operations to find out their views about them and if they think TOT is the way forward in the management of female USI.

The response rate was satisfactory and was mainly from urogynaecologists and this can be explained by the wider representation of urogynaecologists in both IUGA and ICS. The majority of the respondents (97\%) were well aware of the transobturator approach, although it is arguable that a significant percentage of the non-respondents might have been unaware of the procedure or indeed not interested in the sub-urethral

![Figure 3](image3.png)

**Figure 3** Reasons for performing TOTs.

![Figure 4](image4.png)

**Figure 4** Transobturator technique preference among responding surgeons.
tension free slings and therefore did not respond. Unfortunately, geographical practice variation (according to country of origin) was not addressed in this survey. Comparable numbers of the surgeons (16%) were not convinced with the procedure, compared to those who have totally stopped TVT™ in favour of TOTs (13.7%). Lower peri-operative morbidity and the suitability for women with previous vaginal surgery were the main reasons given for preferring the transobturator approach as it avoids the blind entry into the retro-pubic space.

Most of the surgeons undertaking TOTs would prefer to use both techniques (Out—In and In—Out) if they got the appropriate training and the vast majority use polypropylene mesh tapes due to their wider pores, better tissue incorporation and proven safety records. Most of those who mentioned using only a single technique stated that the main reason being the technique they first learned. Although it is supposed that the transobturator approach is less invasive and associated with lower postoperative pain, only a minority of the responding surgeons carried out TOTs as an outpatient procedure (1.6%) or performed the procedure under local anaesthesia (7.8%). Most of the cases are performed as day cases reflecting the minimal invasive and relatively safe profile of the procedure. Reassuringly, nearly all of the responding surgeons undertake routine pre-operative urodynamics. A few of them deviate from the originally described procedures and these variations were mainly in the use of catheter guide during the trochar insertion, routine cystoscopy and postoperative routine catheterisation;

![Figure 5](image1.png)  
**Figure 5** Type of tape preference among responding surgeons.

![Figure 6](image2.png)  
**Figure 6** Reasons for technique preference among responding surgeons.
variations which seem to be inherited from the TVT™ procedure.

Long-term follow-up studies are urgently needed to establish the safety, objective success rates, quality of life improvements and patient satisfaction rates of the transobturator tension free vaginal tapes in the management of USI. To date, only one randomised trial comparing the transobturator approach to TVT™ has been published, yet it involved a relatively small number of patients (30 patients in each arm) and was only up to 12 months of follow-up. The results were encouraging showing transobturator tape to be equally effective to TVT™ with less operative morbidity, yet the paper was later withdrawn by the editor due to failure of the authors to obtain proper ethical approval for the trial.

Numerous types of tapes are now being marketed without being rigorously evaluated in a course of well designed clinical trials, therefore causing a degree of uncertainty among the surgeons. Randomised trials comparing both “Inside—Out” and “Outside—In” approaches and also comparing various mesh types are urgently needed, if we are to provide evidence based practice in the management of USI.

**Conclusion**

Whilst one-third of the responding surgeons think that the transobturator approach for tension free vaginal tapes is the way forward for the management of USI, the majority are awaiting studies with long-term clinical trials.

**Appendix 1**

"Are Transobturator Tapes (TOTs) The Way Forward in Management of USI?"

- **Type of Surgeon:**
  - Gynaecologist
  - Urologist

- **Type of Hospital:**
  - DGH
  - Teaching/ University Hospital
  - Regional referral centre

- **Do you do TVT™ -Gynaecare:**
  - Often
  - Rarely
  - Not at all

- **Do you think Transobturator approach is the way forward:**
  - YES
  - NO

- **Why did you decide to do TOTs (if applicable):**
  - Less Operative time
  - Lower average Blood Loss
  - Lower risk of bladder injury
  - No Blind entry to retropubic space
  - Lower risk of Voiding Dysfunction
  - Cheaper
  - Easier
  - Others..........................................................
  (Please tick all that apply)

- **Why did you decide to not do TOTs (if applicable):**
  - Not convinced with the procedure
  - Awaiting longer term study results
  - Lack of training
  - Did not know about it
  - Not NICE approved
  - Others..........................................................
  (Please tick all that apply)
### References


