

## Case Report

# Repeat Tension-Free Transvaginal Tape (TVT) Sling for the Treatment of Recurrent Stress Urinary Incontinence

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**Abstract:** The pubovaginal sling is one of the preferred procedures for the treatment of female stress urinary incontinence because of its improved long-term cure rates. Recently a modified technique of the pubovaginal sling, known as the tension-free transvaginal tape (TVT), has gained popularity. We present the first reported cases of repeat TVT pubovaginal sling for the treatment of patients with recurrent stress urinary incontinence. Both patients had repeat TVT slings performed between 6 and 9 months following the initial procedure without revision or removal of the previous TVT sling. Both patients reported surgical cure without significant intraoperative or postoperative complications. It appears that reapplication of the TVT polypropylene sling may be a viable option in the event of initial TVT sling failure.

**Keywords:** Pubovaginal sling; Stress urinary incontinence; Suburethral sling; TVT sling; Tension-free transvaginal tape

## Introduction

Despite the lack of standardization, the Burch urethropexy and the pubovaginal sling procedures remain the two most effective operations described in the literature for the treatment of stress urinary incontinence. Pubovaginal slings have conventionally been applied to failed retropubic urethropexies and needle suspensions. Historically, they were primarily designed to compensate for a weak coaptive mechanism in the urethra that

renders it rigid and fixed. Recently, pubovaginal slings have been advocated for intrinsic sphincter deficiency (ISD), urethral hypermobility (UH), or combined ISD and UH [1].

In an attempt to reduce morbidity and improve clinical outcomes with the pubovaginal sling, the TVT sling modification was developed. This is indicated for the primary treatment of stress urinary incontinence, as well as for recurrent stress incontinence in patients who have failed previous anti-incontinence procedures. Recent studies suggest that the TVT procedure is associated with high success rates comparable to those of the traditional suburethral sling procedure, but with a lower incidence of intra- and postoperative complications. The procedure is routinely done via the vaginal route under local or regional anesthesia, with a hospital stay of less than 24 hours [2]. Given the introduction of the TVT procedure within the last 5 years, there are few data regarding the incidence of postoperative complications, such as voiding dysfunction or recurrent stress incontinence. We describe the first cases reporting successful repeat application of a TVT after a primary failure in 2 patients with recurrent stress urinary incontinence.

## Case Report 1

A 64-year-old woman, gravida 1 para 1, with a history of multiple operations for recurrent stress urinary incontinence, presented with worsening symptoms of urinary incontinence. The patient's past medical history was significant for well controlled non-insulin dependent diabetes mellitus. She also took daily estrogen for postmenopausal hormone replacement therapy. In 1983 the patient had a total abdominal hysterectomy and bilateral salpingo-oophorectomy, Marshall-Marchetti-

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Krantz urethropexy and paravaginal repair. Fifteen years later she presented with recurrent anterior vaginal wall prolapse and stress urinary incontinence, and underwent a suburethral allograft fascial sling with anterior repair. Within 1 week the suburethral sling necrosed and the patient had recurrent stress urinary incontinence. One year later a TVT sling was performed without complication under intravenous sedation and local anesthesia using 0.25% lidocaine with epinephrine. The initial TVT surgery was unsuccessful and 8 months later the patient was referred to our urogynecology service for evaluation and management. Urogenital examination revealed a normal neurologic examination and anterior vaginal wall relaxation in the form of a mild cystourethrocele. Change in Q-tip test was 40°. Multichannel urodynamic testing confirmed genuine anatomic stress urinary incontinence. The patient refused conservative therapy and after informed consent felt that her condition was severe enough to warrant surgical correction.

The patient was placed in the dorsal lithotomy position after the administration of spinal anesthesia. An 18 Fr Foley catheter was inserted into the urethra and the bladder was emptied. The TVT sling procedure was performed in a conventional manner. A midline vertical suburethral incision was made and lateral dissection was performed using Metzenbaum scissors to mobilize the overlying vaginal epithelium. Minimal scarring was noted and the previously placed TVT sling was not identified. The TVT sling was delivered without incidence. No significant resistance or scar tissue was noted during passage of the needle. No bladder injury was noted during routine cystoscopy after the passage of each needle. The tape was adjusted with serial intraoperative cough stress tests until fluid loss was no longer visualized on coughing. The plastic sheath of the tape was removed and the extra tape excised. The vaginal mucosa was reapproximated using 3.0 Vicryl sutures. Operative time was 25 minutes and estimated blood loss 20 ml.

The patient was without voiding dysfunction and subsequently discharged on postoperative day 1. On 3-, 6- and 13-month follow-up the patient remains continent and has a normal uroflow.

## Case Report 2

A 71-year-old white woman, gravida 2 para 2, was referred for evaluation of a 3-year history of progressively worsening stress urinary incontinence. Her past medical history was non-contributory and her past surgical history was significant for an abdominal hysterectomy and pubovaginal sling with autologous rectus fascia approximately 5 years prior to presentation. POP-Q examination revealed no significant prolapse and change in Q-tip angle was 30°. Multichannel urodynamic testing revealed a normal bladder capacity with low urethral closure pressure of 16 cmH<sub>2</sub>O.

The patient underwent TVT suburethral sling placement under local anesthesia with i.v. sedation. The procedure was complicated by a bladder perforation on passage of the right needle, which was identified intraoperatively and the needle redirected without complication. The sling was adjusted with serial intraoperative cough tests until urethral leakage was no longer noted. Operative time was 40 minutes and estimated blood loss was less than 50 ml. The patient was discharged on postoperative day 1 with 48 hours of bladder drainage. Her postoperative course was uncomplicated and she resumed normal voiding within 7 days of surgery. She reported rare recurrences of her stress incontinence at the 6-week postoperative visit, but a standing cough stress test was negative. She was instructed to begin pelvic floor exercises with biofeedback and return for follow-up in 3 months.

At the 3- and 6-month postoperative visits the patient reported increasing stress incontinence despite improving pelvic muscle strength. Multichannel urodynamics confirmed recurrent stress urinary incontinence with intrinsic sphincter deficiency. Various surgical options, including repeat TVT, rectus fascia suburethral sling and periurethral injections, were offered to the patient. She desired a repeat application of the TVT sling and written consent was obtained.

Nine months following the initial TVT sling procedure, a repeat TVT was performed in the usual fashion under local anesthesia with i.v. sedation. A midline incision was made in the suburethral portion of the vaginal mucosa and minimal lateral dissection carried out to create paraurethral channels for needle insertion. No significant scar tissue was noted during initial dissection. The previous sling tape could be palpated and partially visualized. The TVT needles were introduced slightly laterally to the previous tape, and the endopelvic fascia and then the rectus fascia perforated on both sides. No significant resistance or scar tissue was noted during passage of the needle. No bladder injury was noted during routine cystoscopy after passage of each needle. The tape was adjusted with serial intraoperative cough stress tests until fluid loss was no longer visualized with coughing. The tape was secured in place and the incisions closed. Operative time was 40 minutes and estimated blood loss was less than 50 ml.

Postoperatively the patient was noted to have an increased postvoid residual at 1 week, and slight downward traction of the bladder neck was applied using a size 26 urethral dilator. Following this, the patient's incomplete bladder emptying resolved completely. On postoperative follow-up at 3 and 6 months her stress urinary incontinence was completely resolved and bladder emptying was normal. Cough stress test and uroflowmetry on follow-up visits have been normal.

## Discussion

Recurrent stress urinary incontinence has traditionally been treated with suburethral sling suspension. The

tension-free vaginal tape is a new and effective procedure with excellent outcomes. Ulmsten et al. report a 3-year follow-up of TVT with a cure rate of 86% [3].

Although TVT is associated with high success rates, failures have been reported. Management of such failures has not been described to date. The etiology of the failure in the initial placement is unclear, but may be related to inappropriate intraoperative adjustment of the tape, failure of the tape to fix in place, or the underlying pathology of the urinary incontinence mechanism. Possible options include pelvic floor rehabilitation, plication of the existing TVT tape, repeat TVT, a traditional suburethral sling, or periurethral injection of bulking agents. Selection of the appropriate salvage procedure may depend on several factors, including the severity of recurrent incontinence, patient characteristics and surgeon experience.

Repeat suburethral sling procedures have been previously reported to be associated with good clinical results, but a slightly higher risk of complications [4,5]. Although the exact mechanism of cure following a repeat procedure has not been described, it is most likely identical to that in the primary procedure – bladder neck support and urethral closure during stress. As repeat sling procedures have been well studied with good experience, it would seem likely that the TVT modification of the suburethral sling would follow the same general principles.

In this first case report of repeat TVT for recurrent stress urinary incontinence, the repeat procedure was performed without complication and with good results on medium-term follow-up. No significant scar tissue, difficulty with needle passage, bladder injury, or increased blood loss was noted, despite previous placement of the TVT sling material. The tape was adjusted in the usual fashion with minimal tension in the suburethral position. Neither of the patients had long-term voiding dysfunction and both demonstrated resolution of their incontinence.

Based on our limited experience, repeat TVT placement for recurrent stress urinary incontinence may be a viable option for patients failing the initial procedure. The procedure should be performed carefully because of the potential risk of increased complications, and patients should be counseled that there are few data regarding the safety and outcomes of this application. Additional data with long-term follow-up will hopefully provide comparative results of TVT salvage procedures for the optimal management in selected patients.

## References

1. Cespedes RD, Cross CA, McGuire EJ. Pubovaginal fascial sling. *Tech Urol* 1997;3:195–201
2. Kohli N, Miklos J, Lucente V. Tension-free vaginal tape. *Contemp Obstet Gynecol* 1999; May
3. Ulmsten U, Johnson P, Rezapour M. A three-year follow up of tension free vaginal tape for surgical treatment of female stress urinary incontinence. *Br J Obstet Gynaecol* 1999;106:345–350
4. Amaye-Obu FA, Drutz HP. Surgical management of recurrent stress urinary incontinence: A 12-year experience. *Am J Obstet Gynecol* 1999;181:1296–1307; discussion 1307–1309
5. Kane L, Chung T, Lawrie H, Iskaros J. The pubofascial anchor sling procedure for recurrent genuine urinary stress incontinence. *BJU Int* 1999;83:1010–1014

**EDITORIAL COMMENT:** The TVT procedure has gained widespread popularity, with reports of success far outstripping complications and failures. These authors report the first cases of repeat TVT. Those on both sides of the TVT debate will read this with interest, using it as further data for their point of view. ‘Antisynthetic’ readers may shudder to think of two layers of synthetics being placed, whereas ‘pro-TVT’ readers will feel comfortable that even TVT failure can be rescued. Only time and additional honest data reporting will clarify the usefulness of this modality.