

Tension-Free Vaginal Tape for The Treatment of Stress Urinary Incontinence: The Paraurethral Approach

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OBJECTIVE: To evaluate the efficiency of the paraurethral approach tension-free vaginal tape for the treatment of stress urinary incontinence.

STUDY DESIGN: The study was carried out in the urogynecology department of Ministry of Health Ankara Etlik Maternity and Women's Health Teaching Research Hospital. Fifty-two women who were diagnosed as having stress urinary incontinence (SI) were enrolled in this prospective study. The paraurethral tension free vaginal tape operation was performed for the treatment of stress urinary incontinence.

RESULTS: The mean follow up period was 36 months. Objective cure was accomplished in 46 patients (88.5%), partial recovery was seen in 2 patients (3.8%), complete failure was observed in 4 patients (7.7%). Bladder perforation occurred in 2 patients (3.8%), Retzius hematoma developed in 1 patient (1.9%). Also, tape erosion was observed in 4 patients (7.7%), on the follow up period.

CONCLUSION: The paraurethral tension free vaginal tape operation is an efficient antiincontinence surgery.

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Key Words: Paraurethral tension-free vaginal tape, stress urinary incontinence

The tension-free vaginal tape procedures are a new generation of operations for the incontinence surgery. Basically, a polypropylene tape is inserted without tension below the mid-point of the urethra by using different kinds of commercially available delivery instruments in order to create an artificial pubourethral (PUL) neoligament at midurethra with also tightening of the vaginal hammock.^{1,2} Tension free suburethral sling insertion can be performed through four different anatomical approaches: the midline vaginal approach, the suprapubic approach, the paraurethral approach and the transobturator approach.³ The paraurethral approach is not new, having been used in the Goebell, Frankenheim Stoeckel procedure in 1910.⁴ Furthermore, DeLancey demonstrated the importance of an adequately tight vaginal hammock in the urethral closure mechanism.⁵ In a live anatomical study under video ultrasound control, Petros and Von Kinsky demonstrated that midurethral anchoring was the most important factor in continence control, but tightening of the suburethral hammock was also an important component for restoration of urethral closure.⁶ Another reason for using the paravaginal approach was its perceived safety, as

the instrument is applied directly upwards. The medial to lateral direction of the midline approach (TVT) has many complications such as arterial perforation even deaths.⁷

The aim of this study was to evaluate efficacy and complications of the paraurethral approach in the treatment of stress urinary incontinence.

Materials and Method

Fifty-two patients, diagnosed as having stress urinary incontinence underwent the paraurethral tension-free vaginal tape procedure in the urogynecology department of Ankara Etlik Maternity and Teaching Hospital between March 2002- March 2005. The inclusion criteria was having stress urinary incontinence. The female patients who had mixed incontinence, detrusor instability or/and any kind of pelvic relaxation extending to the level of hymenal ring or below this level were not included in the study.

Preoperative evaluation included a complete clinical history, urogynecologic examination (stress test, Q-tip test, pad test), neurological examination (clitoral reflex, anal reflex and cough reflex), urinalysis and culture, fasting blood glucose testing, urodynamic studies (cystometry, uroflowmetry, uroprofilometry and Valsalva leak point pressure) and pelvic ultrasonography. All proven urinary tract infections were treated with appropriate antibiotics prior to surgical intervention.

All of the patients gave an informed consent before the surgical procedure. The Institutional Ethics Committee of Ankara Etlik Maternity and Women's Health Teaching Research Hospital approved the study protocol.

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Patients were followed up at 6 weeks, 6 months and annually after the operation with further clinical history, examination and, where appropriate, urodynamic study. The effectiveness of the paraurethral tension free vaginal tape operation has been defined as follows. If the stress test was negative after the operation and the patient reported the restoration of urinary continence then it was regarded as objective cure positive, if the incontinence frequency had declined but still exist after the operation then it was regarded as partial recovery, if no change in the incontinence complaint after the operation then it was regarded as failure. The patients with partial recovery and complete failure were also evaluated through urodynamic study.

The paraurethral tension free vaginal tape operation procedure has been carried out as defined by Petros.³

Results

The patient characteristics are given in Table I. After 6 weeks of follow up complete healing in the vaginal mucosa was observed, besides the patient continued to be dry after the 'tape cutting procedure'. The follow up period was 36 months. No patients lost follow up. Objective cure was accomplished in 46 patients (88.5%), partial recovery was seen in 2 patients (3.8%), complete failure was observed in 4 patients (7.7%).

Table I. Characteristics of the patients

	Patients (n=52)
Age (years±SD)	47.4±7.2
Parity (±SD)	3.5±1.5
Body mass index (kg/m ²)	28.4±5.1
Duration of the symptoms previous to surgery (months)	28±7

Bladder perforation occurred in 2 patients (3.8%) while performing paraurethral tension free vaginal tape operation. Once the perforation noticed, the tunneller was taken out and the procedure was reperformed. The Foley catheter left in the bladder for 5 days and then the catheter was removed. Retzius haematoma developed in 1 patient (1.8%). As a prophylactic measure, oral antibiotics were given for 5 days. Complete resolution was seen after 10 days. No voiding difficulty after the operations was noticed. Tape erosion was detected in 4 patients (7.7%). The complete suburethral sling takedown was performed in 3 patients. In 1 patient, defective healing of vaginal mucosa was seen, hence the polypropylene tape was cut and the free ends of the tape were shortened so that the tape was left beneath the vaginal mucosa. After incising the defectively healed vaginal mucosa, a suture was placed. All of the procedures were carried out under local anaesthesia as an outpatient procedure.

Discussion

Urinary incontinence can be a devastating problem not only to patients but also to surgeons as well. As it has been

continuously emphasized in the medical literature there are numerous techniques and different materials in the treatment process.⁸ The paraurethral approach was first used in the Goebell-Frangenheim-Stoeckel sling in the beginning of 1900's. A paraurethral approach easily allows all three structures said to contribute to urethral closure, external urethral ligaments, hammock and pubourethral ligament to be tightened. Furthermore, the hammock can be re-attached to the closure muscles, in line with Delancey's studies.⁵

The relative importance of the pubourethral ligament, vaginal hammock and external urethral ligament for the urethral closure mechanism in any individual patient can be tested with a simple test "simulated operation", using a hemostat to anchor in turn, the external urethral meatus, the midurethra, and taking a fold of the suburethral vagina.³

We have performed the paraurethral IVS procedure in the study. The paraurethral operation obtained a 88.5% success rate in our study. Petros et al. has been giving a similar objective cure rate (88%) in their series.⁹ Partial recovery rate and complete failure rate were 4.6% and 7.7%, respectively.

Bladder perforation occurred in 2 patients while performing the operation. Cystoscopic study revealed the perforations in the superolateral surface of bladder. The guide was removed and re-inserted. Retzius haematoma; 25X32X17 mm in dimensions measured through transvaginal ultrasonography developed in 1 patient and disappeared within 10 days without any surgical intervention.

Tape erosion was detected in 4 (7.7%) patients. Lim et al. notified the sling protrusion rate for IVS as 1.7% in their study.¹⁰ The complete suburethral sling takedown was performed in 3 patients. In 1 patient, defective healing of vaginal mucosa was seen, hence the polypropylene tape was cut and the free ends of the tape were shortened so that the tape was left beneath the vaginal mucosa. After incising the defectively healed vaginal mucosa, a suture was placed. All of the procedures were carried out under local anaesthesia as an outpatient procedure.

The paraurethral tension-free tape is an efficacious anti-incontinence surgery. An urogynecologist should be familiar with the paraurethral approach which is a very important technique in her/his surgical armament. Our preference for this approach is based on its inherent safety, important for young trainees, and its anatomical accuracy.

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