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Research Article

TRANS-VAGINAL TRANS-OBTURATOR TAPE FOR TREATMENT OF STRESS INCONTINENCE: A STUDY

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ABSTRACT
Stress incontinence is often an under-reported and undiagnosed condition. It greatly affects the quality of life of a woman. The economic burden of the problem on the society is high. Efficacy, intra- operative and post-operative complications of inside out technique of trans-vaginal trans-obturator tape for treatment of stress urinary incontinence has been studied and analyzed. A total of 10 patients underwent trans-vaginal trans-obturator mid urethral sling surgery. Polypropylene mesh with specially designed helical passers attached to handles was used. Cure rate was 100% at twelve months but one patient had partial cure till six months. No intra-operative complication was encountered. Average hospital stay was 2 days in patients who had TVTO procedure only and was 4-5 days in cases where vaginal prolapse surgery was also done. Hesitancy was present in one patient but no retention of urine occurred. Patients were followed for one year. 6 patients had pain at exit wounds in thighs at 6 weeks, pain persisted in 2 patients at 6 months and in one patient till one year. Two patients developed urge incontinence. TVTO is an effective, minimally invasive procedure with no major intra-operative and post-operative complication. It has shown good results and learning curve is short.

Keywords: *Stress Incontinence, Midurethral Sling, Trans-Obturator Approach*

INTRODUCTION
SUI, the involuntary loss of urine on coughing, sneezing, laughing, etc. greatly affects the quality of life of a woman in regard to social interaction, emotional distress and sexual activity depending on its frequency and severity. The economic burden of the problem on the society and the country is great because of repeated UTI, skin problems and cost of laundry diapers and pads etc.
The predisposing factors are childbirth, trauma, ageing, obesity, congenital weakness of supporting pelvic structures. Conservative methods of pelvic floor exercises, weight reduction, lifestyle modifications, and medical treatment help to a some extent only but do not provide a cure.
Minimally invasive mid-urethralslings with an inside-out technique provide the safest approach and is now considered to be the gold standard treatment for SUI (Spinosa and Dubuis, 2005).

Aims and Objects
1. To study the efficacy of trans-vaginal trans-obturator mid-urethral sling operation for SUI.
2. To study the intra-operative and immediate postoperative complications.
3. Any complications, side effects or complaints as reported by the patient during one year follow up.

MATERIALS AND METHODS
The study was conducted in a tertiary hospital of North Delhi, Hindu Rao Hospital. A total of 10 patients underwent trans-vaginal trans-obturator mid urethral sling surgery. Polypropylene mesh (macropore type I) with specially designed helical passers attached to handles covered with a plastic sheath was used with inside out techniques.

Inclusion Criteria
1. Genuine stress incontinence- diagnosed by history of SUI, demonstration of urinary spurt through urethra on coughing.
2. Family completed
3. 3. Using contraceptives or willing to adopt future contraception

Exclusion Criteria

1. Urge urinary incontinence
2. Urinary tract infections
3. Medical disorders like diabetes mellitus, chronic pulmonary disease, neurological diseases
4. Trauma to spine or genitourinary tract
5. Pregnancy, plan for pregnancy
6. Previous failed surgery for SUI

Patient's demographic profile, obstetric history, menstrual history, general and systemic examination were recorded on the predesigned proforma. Speculum examination (with full bladder) to observe SUI on cough was done. PV examination was done after emptying bladder. Residual urine was recorded. TVT-O surgery along with surgery for uterovaginal prolapse if required was done. Intra-operative, immediate postoperative complications were recorded on the proforma.

Patients were followed upto 1 year. Cure/relief in urinary stress incontinence, symptoms/complications /other complaints was recorded.

The results were analyzed and compared with other studies.

RESULTS AND DISCUSSION

Results

Table 1: Demographic distribution of patients and baseline characteristics

Baseline characteristic	No. of patients
Age mean	37.7 years
Parity	
Nullipara2	
Multipara	8
Menopausal status	
Premenopausal	9
Postmenopausal	1
Uterocervical descent	
1st degree	Nil
2nd degree	Nil
3rd degree	2
Associated cystocele only	4
Associated rectocele only	1
Associated cystocele and rectocele	3
Not associated with cystocele, rectocele, enterocele	2

Table 2: Intra-operative details

Intraoperative details	No. of patients (n)
1. Bleeding minimal <50cc	2
Average 50-100cc	6
>100cc *	2 *
2. Bladder injury	Nil
3. Vaginal wall injury	Nil
4. Urethral injury	Nil
5. Time taken (average in minutes)	14.4(excluding time for** POP surgery)
6. Difficult insertion	Nil
7. Haematoma	Nil

** In these 2 patients along with TVT-O vaginal hysterectomy was also done for associated 3rd degree uterovaginalprolapse.*

***POP surgery for cystocele, rectocele and vaginal hysterectomy for 3rd degree U V prolapse.*

In our study, the mean age of subjects were 37.7 years while mean parity was 3.3. Except for one all patients were premenopausal. 20% of patients had third degree uterovaginaldescent. 70% were associated with cystocoel. Both cystocoel and rectocoel were present in 3 cases.
No intra-operative complications were encountered in our study patients. Average blood loss was between 50-100 cc (measured by weighing soaked pre weighed swabs).

Table 3: Post-operative details

Post-operative details	No. of patients
1. Retention urine	Nil
2. Fever	Nil
3. Urinary tract infection	Nil
4. Deviation of urinary stream	1
5. Bleeding	Nil
6. Pain	
mild	9
moderate	1
severe	Nil
7. Hospital stay	
<2 days	2
3-5 days	8
>5 days	0

Pain was mild in all cases except one. Average hospital stay was 2 days in patients who had TVTO insertion only and was 3-5 days where other vaginal surgery was also done.

Table 4: Follow up

Follow up details	6weeks	6months	12 month
1. Pain	6	2	1
2. Retention urine	Nil	hesitancy 1	Nil
3. UTI	Nil	1	2
4. Deviation of urinary stream	1	1	Nil
5. Erosion	1	Lost to follow up	Lost to follow up
6. Extrusion	Nil	Nil	Nil
7. Cure complete	9	9	10
8. Partial cure	1	1	Nil
9. Recurrence	Nil	Nil	Nil
10. Urge incontinence	2	2	1

Patients were followed up for one year. 6 patients had pain at exit wounds in thigh at 6 weeks, pain persisted in 2 patients at 6 months and in one patient till one year. Other 3 women had perineal pain in post-operative period which was mild and lasted for 6 weeks. Deviation of urinary stream towards one thigh was present in one. Hesitancy was present in one woman but no retention of urine occurred. One patient had vaginal erosion and required readmission for continuous bleeding which responded to conservative treatment. However she was lost to follow up.
Two patients (20%) had symptoms of urge incontinence postoperatively. One had mixed incontinence preoperatively with dominating symptom of stress incontinence, thus after SUI surgery the symptoms of urge incontinence became more explicit. She responded to anticholinergics partially. The other patient, developed symptoms of urge incontinence de novo and responded to anticholinergics satisfactorily.

Cure rate was 100% after 12 months. One patient (10%) had partial cure of stress incontinence but on one year follow up she was continent and completely cured. This patient had severe SUI preoperatively, to the extent that turning to one side from supine position or getting up from the bed made her incontinent. She also had postoperative deviation of urinary streamto one side during micturition.

2 patients have not completed follow up of 1 year till date. However they have no postoperative complaints and are satisfied with TVTO surgery.

No major postoperative complication was encountered in our study.

Discussion

Results of our study are in corroboration with de Leval and Waltregny (2005), Verma *et al.,* (2013) in relation to cure rate. Regarding intraoperative and post-operative complications our study is in corroboration with various other studies i.e. (De Leval and Waltregny 2005; Richter *et al.,* 2010; Tahseen *et al.,* 2007; Kaelin *et al.,* 2009; Rajan and Kohli, 2005). No major complication as reported by Rardin *et al.,* (2009), Peter *et al.,* (2010) occurred in our case (Table 5).

The trans-obturator route or TVT-O did not have any bladder or urethral injury in our study.

Trans-obturatorroute therefore has minimal complications, routine cystoscopy is not required. The tape inserted has a more anatomical position, it does not pass through retropubic space. It has less incidence of postoperative retention of urine and voiding difficulties. Return to normal activities is earlier. It also has a shorter learning curve.

The monofilament macropore type 1 polypropylene mesh sling placed tension free below the midurethra for treatment of SUI acts as a pivot around which the distal and proximal urethra move during increased intravescical and raised intra-abdominal pressure. Further, with time the macrophages and fibrous tissue formed near the mesh tape forms a stronger suburethral support.

We therefore advocate use of inside-out technique of transobturatormidurethral slings for treatment of SUI.

Table 5: Studies by various authors

TVT/ TVT0	Author	Intraoperative complication	Postoperative complications	Cure rate	Comments
TVTO	Ogan *et al.,* (2009)	1.Hmg 0.6% 2.Bladder injury2.7% 3.Urethral injury 0% 4.Vascular injury 0.1%	1.Pelvic hematoma0.7% 2.Retention urine 2.3% 3.UTI 0.7% 4.OAB 0.2% 5.vaginal erosion 0.5% 6.Bladder/urethral erosion 0.02%	84%	1.Less voiding dysfunction 2.less blood loss 3.less bladder perforation. 4.Short operation time
TVT	Meschia *et al.,* (2001)	1.Bladder perf.6% 2.Retropubic bleeding0.5% 3.Obturator N.injury1case	1.Voiding problem 0.5%	92% 4%improved	
TVT	Karram *et al.,* (2003)	1.Bladder perforation 4.9% 2.N.injury0.9%	1.Voiding problem 4.9% 2.UUI12% 3.UTI 10.9%	82%	0.5% recurrent SUI

		3.Haematoma 1.7%	4.Erosion0.9%		
TVT	Quicios *et al.*, (2005)[4]	1.Bladder perf3% 2.Hypogastric hematoma 1%	1.Ac. Urinary retention1% 2.Residual urine in bladder3% 3.denovo urgency9% 4.vaginal extrusion2% 5. Pelvic discomfort 1%		7% failure
TVT-O	De Leval and Waltregny (2005)[5]	No intraoperative complication		90%	
TVT-O	Delorme (2001)		1.Sepsis 1 case 2.postop dysuria 4 cases	15/40	1pt.improved
TVT/ TVT-O	Richter *et al.*, (2010)		1.Voiding problems2.7%/0% 2.Neurological symptoms4/9.4%	80.8%-TVT 77.7%-TVTO	No diff. in postop UUI, QOL
TVT-O	Tahseen *et al.*, (2007)	No intra op complication	1.UTI 1case 2.Catheter required 5 days- 1case 3.Erosion16.6%	31% cure 65%improved	3.5% failure
TVT-O	Kaelin *et al.*, (2009)	Few	1.Urgency10.2% 2.Perineal pain2.2% 3.Dyspareunia9% 4.Erosion7.6%	72.1% Satisfactory rate	Erosion differed in 3 types of tapes. 4% in Aris, 17% in Obtape, 0%in TVTO
TVT-O	Rajan and Kohli (2005)	Retropubic hematoma 2 cases			
TVTO	Rardin *et al.*, (2009)		Recurrent thigh abscess with necrotizing fasciitis		
TVT-O	Verma *et al.*,		1.UTI 16.67%	100% at 12	Improvement

	(2013)	2.Groin pain 23% 3.UUI 11.5%	months	in QOL 100%
TVT-O	Michael *et al.*, (2012)	1.UTI and voiding dysfunction10.7% 2.Neurological problems 9.7%	72.3% objective 48.3% Subjective	
TVT-O	Peter *et al.*, (2010)	Hematoma from Corona mortis artery 1 day after surgery -1case		

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