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Original Article

Factors affecting voiding function after tension free vaginal tape surgery

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Abstract

Objectives: To study patient characteristics, pre-operative protocols and post-operative outcome in Indian women undergoing tension free vaginal tape (TVT) for urodynamic (stress) incontinence. *Methods:* Thirty-three women who underwent TVT surgery were evaluated preoperatively for demographic, clinical and urodynamic parameters and postoperatively for voiding dysfunction. They were followed upto 6 months after surgery. Statistical analysis was done using the chi square test. *Results:* Voiding dysfunction was seen in eight patients (24.2%), all of whom had short-term dysfunction which resolved with conservative measures. Age, menopausal status, and previous or concomitant pelvic surgery had no influence on the incidence of post-operative voiding dysfunction although previous failed continence surgery was a significant predictive factor ($P<0.05$). Women who squatted for voiding, had better postoperative voiding function despite having low peak flow rates in preoperative uroflowmetry. It was not possible to conduct satisfactory uroflow studies in many women due to variation in natural voiding positions. *Conclusions:* Postoperative voiding function could not be correlated to urodynamic parameters obtained from the conventional urodynamic unit. It is imperative to modify the urodynamic unit to allow women to participate in voiding function studies in their natural voiding position. Prediction of postoperative voiding dysfunction in an ethnic population must be done in confluence with cultural practices.

Key words : stress incontinence, TVT, voiding function, Indian women

Introduction

Surgical treatment for stress urinary incontinence has undergone tremendous changes in terms of principle and technique over the last century. The ultimate aim of any anti-incontinence surgery is to achieve dryness in a simple, effective and affordable procedure with minimal complications. The quest for the ideal surgery continues but the introduction of the tension-free vaginal tape (TVT) has opened a new chapter in surgical management of stress urinary incontinence[1]. In developing countries, after an initial phase of skepticism towards this new procedure, there is now a greater acceptance of TVT as a reasonably affordable and effective solution to the problem of female stress urinary incontinence. However, there is a plausible lack of data regarding the patient characteristics, preoperative workup protocols and postoperative outcome in the Indian women undergoing TVT. The present study was undertaken in our Department of Urogynaecology on the undergoing TVT in the last 3

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years with the aim of studying the above mentioned aspects in a cross-section of ethnic Indian female population.

Method

The medical records of all the patients who underwent TVT surgery at our hospital during February 2002- July 2005 were reviewed retrospectively to analyze their post-operative voiding function and any factors that could be affecting the same. The terminology used in the present study is as per the recommendations of the International Continence Society, except where otherwise specified [2].

As a routine preoperative work-up, all patients underwent urodynamic evaluation in order to confirm the diagnosis. Thereafter they were counseled regarding the possible outcome and cost of surgery. The intraoperative and postoperative outcomes were recorded for all patients who underwent surgery. Patients were encouraged to void naturally within 6 hours of surgery. All patients underwent bladder catheterization to check postvoid residual urine and if voiding function was normal, this was discontinued and patient was discharged from hospital within 24 hours of surgery. Voiding dysfunction was defined as postvoid residual urine more than 100 mL or more than 10% of the voided volume with three consecutive voids. Such patients were taught intermittent self-catheterization and encouraged to try to void naturally till normal voiding function resumed. The first routine postoperative visit was at 3 weeks and thereafter all patients were followed up till 6 months after surgery.

The preoperative variables which were analyzed in order to determine their influence on postoperative voiding dysfunction included patient's age, menopausal status, voiding position, history of previous pelvic surgery including previous continence surgery, and peak flow rates in uroflowmetry. An intraoperative variable considered was concomitant surgery done along with TVT. For statistical analyses the chi-square test was used and level of significance was taken as P=0.05.

Results

Thirty three patients underwent the TVT procedure between 1st February, 2002, and 31st July, 2005. Table 1 shows characteristics of the patients in the study. All the thirty three patients (100%) were surgically cured. Twenty five patients (76%) had normal postoperative voiding function while 8 patients (24%) had voiding dysfunction following surgery. All these eight patients responded to conservative management in the form of intermittent self-catheterization and normal voiding function resumed within 2 weeks postsurgery. None required sectioning of the tape.

Table 2 shows the difference in various variables demographic and clinical variable between the two groups of patients - the normal post operative voiders (n=25) and those with post-operative voiding dysfunction (n=8). The mean age of patients and their menopausal status were not significantly different in the two groups (P>0.05). A greater percentage of normal voiders adopted squatting position for voiding.

Table 1. Patient characteristics (n=33).

Characteristic	Number
Mean age (Years)	33 (range, 26 - 75)
Menopausal status	
Premenopausal	18 (54.5%)
Postmenopausal	15 (45.4%)
Voiding position	
Squatters	15 (45.4%)
Sitters	18 (55%)
History of previous pelvic surgery	16 (48.4%)
History of previous continence surgery	3 (9.1%)
Uroflow studies	
Peak flow rates > 15 mL/s	15 (45.4%)
Peak flow rates < 15 mL/s	8 (24.2%)
Unsatisfactory study	10 (30.3%)

Table 2. Demographic variables in the two groups.

Variable	Voiding dysfunction (n=8)	Normal voiders (n=25)	P value	Odds ratio
Mean age (y)	38	32		
Menopausal status				
Postmenopausal (No.)	5 (63%)	10 (40%)	p=0.265954	2.5
Premenopausal (No.)	3 (37%)	15 (60%)		1
Voiding position				
Natural sitters (No.)	8 (100%)	10 (40%)	P=0.003	
Natural squatters (No.)	-	15 (60%)		

Table 3. Previous and concomitant surgery in the two groups.

Variable	Voiding dysfunction (n=8)	Normal voiders (n=25)	P value
Previous pelvic surgery (No.)	5 (63%)	11 (44%)	0.0773
Previous continence surgery (No.)	3 (38%)	-	
Concomitant surgery (No.)	2 (25%)	4 (16%)	

Table 4. Pre-operative peak flow rates in the two groups.

Peak flow rate	Voiding dysfunction (n=8)	Normal voiders (n=25)	P value
> 15 mL/s	8 (100%)	7 (28%)	0.0018
< 15mL/s	-	8 (32%)	
Unsatisfactory study	-	10 (40%)	

Previous failed continence surgery was associated with a significantly greater risk of postoperative voiding dysfunction (P<0.05). History of pelvic surgery as such and even concomitant pelvic surgery did not affect postoperative voiding function.

Seven (28%) out of the 25 patients who had normal postoperative voiding function had preoperative peak urinary flow rates of more than 15 mL/s while 8 (32%) had peak flow rates less than 15 mL/s; satisfactory uroflowmetry was not technically possible in 10 (40%) patients. All of the 8 patients (100%) who developed post-operative voiding dysfunction had preoperative peak urinary flow rates more than 15 mL/s.

Comment

Stress urinary incontinence is an extremely distressing

condition for any woman and she seeks redressal for the same. The best chance of surgical cure for stress incontinence is successful primary surgery and this should be considered only after a period of conservative treatment from a specialist therapist has been offered and rejected, or has failed[3]. Prior to definitive management, a primary clinical work-up including urodynamic evaluation is mandatory to confirm the diagnosis and establish suitability for surgery. Although newer and improvised continence procedures have produced better surgical cure rates, every surgery comes with its limitations because exact reconstruction of the intricately balanced natural continence mechanism is not possible.

Voiding dysfunction is the most common complication associated with any continence procedure but is under—reported[4]. However, accurate prediction of postoperative voiding dysfunction has eluded urogynecologists till date. Each patient has the right to choose to accept or reject a surgical procedure aimed at treating her stress urinary incontinence, if she is uncomfortable with its possible complications. It is here that the role of pre-operative counseling for continence surgery cannot be undermined.

The present study is reflective of a cross section of urban Indian female population. We found that most of our patients were middle-aged women and only 15 (45.4%) were postmenopausal. However, age and menopausal status did not seem to be of significance in predicting the risk for postoperative voiding dysfunction in the present series in corroboration with few studies[5,6] but in contrast to the observations by some other authors[7,8]. History of pelvic surgery or even concomitant surgical procedures like abdominal or vaginal hysterectomy, cystocoele repair and perineorrhaphy did not increase the risk of postoperative voiding problems. Nevertheless, previously failed anti-incontinence surgery like Stamey's procedure or Burch colposuspension definitely placed the patient at a higher risk of voiding dysfunction following surgery. Similar observations have been made in previously published reports[8,9] although it has also been suggested in some studies that previous prolapse surgery can also be linked to postoperative voiding dysfunction[10].

Peak flow rates less than 15 mL/s in preoperative uroflowmetry have been associated with post-operative voiding dysfunction[5,6]. The most interesting finding of the present study was the paradoxical relationship of preoperative uroflowmetry with postoperative voiding function. Also, satisfactory uroflow studies were not possible in 30.3% of patients because these patients were unable to void comfortably in the sitting position which is mandatory with the present design of urodynamics apparatus. However, such patients who were used to voiding in the squatting position had normal postoperative voiding function. Researchers in gastroenterology have published articles wherein squatting has been accepted as a more mechanically efficient method of voiding and this has been correlated to a lesser incidence of noninfective bowel diseases in African and Asian population[11]. Ancient Indian yoga scriptures also recommend a squatting exercise, malasana for the pregnant women to facilitate vaginal delivery. With this background we suggest that squatting is a better position for urinary voiding and reduces the risk of voiding dysfunction.

The limitation of our study is the small number of the sample which forbids us from drawing definite conclusions. Further objective evaluation is needed to establish whether the mechanics of micturition is considerably different in the sitting and squatting position so as to affect voiding efficiency. However, we request the fraternity of urogynecologists dealing with populations that are used to squatting to report their experience in this regard. Another recommendation we make is to modify the western urodynamics apparatus to suit the needs of Indian patients who can then void in the positions that they are naturally used to, so that urodynamic parameters could be accurately measured notwithstanding ethnic variations. This will help in generating a database of urodynamic parameters which is directly relevant to ethnic Indian population.

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