

# Comparison of two methods of tension of the urethral medium tape in patient female with stress urinary incontinence submitted to T.O.T.

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**Abstract:** *Introduction:* The placement of middle urethral tape is the most common approach for women with I.U.E (stress urinary incontinence). Unfortunately, there is no standardized method to give tension to the tape, which can cause possible obstruction in the bladder outlet. *Objectives:* To evaluate the urinary flow and post voiding residual, comparing two tension methods. *Material and Method:* A case-control study was conducted in 75 women diagnosed with I.U.E, who underwent placement of a T.O.T tape; using two methods for calibration: one with Foley urethral catheter No 16F (5.3mm) with interposition of scissors May (3mm) and another using Hegar dilators 8mm inside the urethra and 4mm between the urethra and the tape. The patients were evaluated in pre- and postoperative (3 months) the: Q (max), and post-void residue. *Results:* 36 patients underwent tension of the tape on Foley urethral catheter 16F + scissors (controls) and 39 with dilators Hegar 8 / 4mm (cases). The Q (max) Pre-operative of the control group was 40.2 +/- 2.6 and in the Post-operative 27.6 +/- 4.1 (P: 0.044). In the case group, the preoperative Q (max) was 39.1 +/- 2.1 and the postoperative Q (max) of 31.1 +/- 2 (P: 0.000). The post-micturition residue of the control group was 9.2 +/- 6 ml and in the postoperative period it increased to 19.1 +/- 22 ml, in the case group the preoperative residue was 7.9 +/- 6.5 ml and the postoperative period decreased to 3, 6 +/- 4.7 (p: 0.0000). The variation of the Post Voiding residual in the control group of -4.3 +/- 4.4 and in the case control group of 9.9 +/- 22 (p: 0.0002). *Conclusion:* The case group (method 8/4) showed a statistically significant improvement in Q (max) and postoperative post voiding residual in relation to the control group (catheter + scissors), who presented 11% of overcorrections (p: 0.048).

**Keywords:** Middle urethral; Stress urinary incontinence; T.O.T. tape.

## INTRODUCTION

The International Continence Society (ICS) defines stress urinary incontinence (I.U.E) as the loss of urine that occurs before exertion or exercise or secondary to sneezing or coughing<sup>1</sup>. This situation is related to two physiopathological factors: urethral hypermobility and intrinsic sphincter deficit.

UI is not a disease that endangers the life of the patient, but significantly deteriorates the quality of life of the sufferer, since it reduces their self-esteem and diminishes their autonomy<sup>2</sup>.

Surgical treatment is aimed at increasing the support of the urethra and thereby increasing the urethral resistance during the efforts. In cases with clear urethral hypermobility, and even in non-severe intrinsic sphincter insufficiency or associated with a fixed urethra, tension-free urethral suspension techniques (minimally invasive TVT or TOT techniques) have become the reference tests and they have displaced colposuspension techniques like Burch's, which for years was the most effective technique. The tension-free urethral suspension techniques are based on the Petros and Ulmsten studies, which propose a new conception of pelvic dynamics (Petros integral theory)<sup>3</sup>, and consists of placing a synthetic material tape (made of monofilament braided polypropylene) below the urethra, towards the posterior pubic surface in the case of TVT or towards the obturator holes in the TOT, as a reinforcement of the pubourethral ligament. It is assumed that these tapes are placed "without tension".

The original description had an accurate guide on how to establish the desired distance between the tape and urethra. Ulmsten et al. described the distance to achieve as: "Placing a 16-Charrière Foley catheter in the urethra and a Metzenbaum scissor between the urethra and the tape"<sup>4</sup>. Delorme defined the distance between the tape and the urethra as "a visible distance of a few millimeters"<sup>5</sup>.

Unfortunately, there is no standardized method to give tension to the tape, which can cause possible obstruction in the bladder outlet.

For its standardization, several alternatives have been proposed, such as those by Ludwig S et al. that proposes the TOT 8/4 where it is observed in 83% of the patients the tape is between 3 to 5 mm below the urethra<sup>6</sup>.

## OBJECTIVES

The objective of the study was to evaluate the urinary flow and post voiding residual, comparing two tension methods of the suburethral tape during the surgery of T.O.T for I.U.E.

## MATERIAL AND METHODS

A case-control study was carried out in 75 women diagnosed with Stress Urinary Incontinence, using Urogynecological and Urodynamic exams and who were eligible for this study. They were subjected to tape placement T.O.T according to the Delorme technique; using for calibration two methods: one with Foley urethral catheter No 16F (5.3mm) with interposition of scissors May (3mm) called "controls" and another using Hegar dilators 8mm urethral and 4mm between the urethra and tape called "cases".

The patients were evaluated in pre and postoperative (3 months) the: Q (max), and postvoid residual

Exclusion criteria: It was decided to exclude patients who presented:

Urinary urgency or urge urinary incontinence; Previous incontinence surgery; Prolapse of pelvic organs  $\geq$  stage II; Pelvic radiotherapy; Use of uroselective drugs, and neurological diseases.

## RESULTS

Of the total number of patients, and in a randomized manner, 36 patients underwent surgery with tape tension on a 16F Foley Catheter with May Scissors interposition (controls) and 39 patients with Hegar dilators urethral 8mm and 4mm between the urethra and the tape (table 1).

TABLE I.  
Preoperative.

Variable	Cases	Controls	Statistical test	Value of p
N	39	36		
Age (years)	52.3 +/- 7.2	53.7 +/- 7.1	Student' t	0.39
SLUT time (years)	4.1 +/- 0.9	4.1 +/- 1.3	Student' t	0.73
No cloths / day	3,6 +/- 0.8	2,9 +/- 0.9	Student' t	0,0004 (*)
Body Mass Index	25 +/- 1,8	25,5 +/- 2.1	Student' t	0.097
Parity	2.7 +/- 1.1	2.8 +/- 1.1	Student' t	0.64
DM2	20.5 %	16.7 %	Chi squared	0.34
Obesity	38.5%	55.6%	Chi squared	0,074
Arterial hypertension	10.3%	2.8%	Fisher's exact test	0.204
Caesarean section	12.8%	11,1%	Fisher's exact test	0.55
Q (max) Pre-Operative	39.1 +/- 2.1	40.2 +/- 2.6	Student' t	0,044 (*)
VLPP	88.5 +/- 17.3	85.4 +/- 19.6	Student' t	0.48
Post Voiding Residue (ml)	7.9 +/- 6.5	9.2 +/- 6	Student' t	0.35

Postoperative

Variable	Cases	Controls	Statistical test	Value of p
N	39	36		
Q (max) Post-Operative	31.1 +/- 2	27.6 +/- 4.1	Student' t	0,0000 (*)
Loss of urine PO	10.3 % (4)	11.1% (4)	Fisher's exact test	0.598
Post Voiding Residue (ml)	3,6 +/- 4,7	19,1 +/- 22	Student' t	0,0000 (*)
Re operation	0	11,1% (4)	Fisher's exact test	0,048 (*)
Post-Voiding residual variation	-4,3 +/- 4.4	9,9 +/- 22	Student' t	0.0002 (*)

The average Q (max) in the Pre-operative of the control group was 40.2 +/- 2.6 and in the Post operative 27.6 +/- 4.1 with statistically significant improvement (P: 0.044).

In group case, the average preoperative Q (max) was 39.1 +/- 2.1 and the post-operative one of 31.1 +/- 2 also being statistically significant (P: 0.000).

The average post-void urine residue of the control group in the preoperative period was 9.2 +/- 6 ml and in the post-operative group it increased to 19.1 +/- 22 ml, while in the case group the preoperative post-micron residue was 7.9 +/- 6.5ml and the postoperative period decreased to 3.6 +/- 4.7 (p: 0.0000).

The variation of the Post Voiding residual in the control group of -4.3 +/- 4.4 and in the case control group of 9.9 +/- 22 shows a statistically significant reduction (p: 0.0002).

Two patients in the control group had increased post-void volumes due to overcorrection, which had to be submitted to removal of the tape at 3 months.

DISCUSSION

The musculoelastic mechanism proposed for continence<sup>2</sup>, stretches and narrows the proximal urethra against a competent pubourethral ligament (PUL). Narrowing a tube increases its resistance to flow, inversely by the 4<sup>th</sup> power of the radius (Poiseuille's Law). An adequately tightened PUL is required to restore this closure mechanism<sup>2</sup>. However, this exponential effect works both ways. It means that the tightening of the sling has to be very precise. With any

sling operation, excessive tension on the sling will constrict the urethra and cause urinary retention. On the other hand, excessive looseness of the sling will cause ongoing SUI. In our comparative study, the methodology using the Hegar dilators inside the urethra and between the urethra and tape obviously more closely approximated the natural physiology with fewer retention states.

CONCLUSION

Patients undergoing TOT surgery with adjustment method 8/4 (cases) presented statistically significant improvement of Q (max) and postoperative post voiding residual in relation to the group submitted to calibration with Foley Catheter + scissors (controls), who presented in 11%, overcorrection with increased post voiding residue (p: 0.048).

DISCLOSURE STATEMENTS

There was no conflict of interest, informed patient consent was obtained, and the study was approved by the local ethical committee.

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