

Retropubic urethrolysis and tape sectioning for obstruction following incontinence surgery. Long-term results

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Abstract: To evaluate the long terms results of retropubic urethrolysis and TVT tape section. Twenty-three patients were treated for clinical-urodynamic urinary obstruction following incontinence surgery between 1996 and 2004. Nineteen patients could be located and they completed a clinical review. Nine patients (Group I) underwent a retropubic urethrolysis procedure. In ten patients (Group II) section of the TVT sling was performed. Mean follow up was 59 ± 25 months in the urethrolysis group I ($n = 9$) and 39 ± 18 months in the TVT tape section group II ($n = 10$). All patients were reviewed by clinical interview, urine flowmetry, residual volume and cough test. Subjective assessment was carried out by questionnaires: SUIQ, I-QOL and PGI-I. Maximum average flow was significantly enhanced in both groups – to a greater extent in the TVT-section group. Residual volume disappeared in all cases. According to medical history, urgency was completely abolished in 12% of cases with relief in 87% in group I. In group II, urgency was totally eliminated in 66% with improvements seen in 33%. No patients, according to SUIQ questionnaire, were cured of their urgency incontinence in group I and only 50% in group II. I-QOL questionnaire showed 33% of patients in group I with more than 80 points and 50% in group II. The PGI-I questionnaire showed that 22% of patients in group I and 40% in group II experienced great improvement, and 33% in group I and 30% in group II showed sufficient improvement. Urethrolysis and tape sectioning can be highly successful to relieve iatrogenic obstruction and seem to be long-lasting. Complete resolution of storage symptoms is less likely. Quality of life evaluation of the outcome of urethrolysis and tape section is necessary.

Key words: Iatrogenic obstruction; Stress urinary incontinence; Tape sectioning; Urethrolysis.

INTRODUCTION

Standard surgery for urinary incontinence can cause urinary dysfunction along with storage or voiding symptoms, or both simultaneously, in 2-24% of cases.¹

Tension-free vaginal tape (TVT), introduced by Ulmsten in 1995,² has not eliminated these complications. In addition, the procedure occasionally causes further urinary dysfunction with similar characteristics occurring in up to 26% of cases³ and necessitating tape sectioning in 4-6% of cases.^{4,5} Although there are less data on surgical outcome with the transobturator tape technique, complications do not seem to be eliminated completely with this technique either.^{6,7}

Satisfactory results have been published for both urethrolysis and the sectioning of suburethral tape.⁴ However, there is a clear lack of long-term results, above all those obtained via quality of life questionnaires.⁸

The objective of this study is to evaluate the long-term results in patients who underwent two types of urethrolysis: retropubic urethrolysis and section of TVT tape. Furthermore, we aim to examine the factors that could influence the results.

MATERIALS AND METHODS

Twenty-three patients were treated for urinary obstruction following incontinence surgery in our department from 1998 to 2006. Nineteen of these patients could be located and they agreed to undergo a clinical review.

Conventional surgery for incontinence had been carried out in nine cases: Burch in six, Raz in two and Marshall-Marchetti-Krantz in one. These cases constitute group I. TVT was conducted in ten cases, making up group II.

The diagnosis of obstruction was based on a combination of the following: a clear relationship between surgery and the development of symptoms, urodynamics parameters (relatively high detrusor pressure, low maximum flow rate and residual volume), physical examination and endoscopic parameters (urethral angulation or kinking). The onset of symptoms was immediate in all patients in both groups following surgery. Table 1 outlines patients' clinical characteristics and urodynamics parameters prior to incontinence

surgery. It also shows the clinical status obtained by questions in the history and the complementary findings following incontinence surgery.

In group I, urethrolysis was carried out retropubically. The urethra was mobilized with scissors and a blunt dissection, releasing all adhesions to the pubic symphysis. Sufficient and easy mobility was determined when the bladder-neck and urethra were completely free from adhesions. Urethrolysis in group II involved locating and sectioning one of the two branches of the sling. For this, it is often necessary to dissect widely the lateral side to locate the tape.

Urethrolysis was carried out between 7 and 95 months (37.3 ± 29.2) following incontinence surgery in group I and between 3 and 36 months post-surgery (18.5 ± 12.4) in group II. Follow-up periods ranged from between 25 to 84 months (59.3 ± 25.2) for the first group and 15 to 70 months (39.1 ± 18.8) for the second group.

All patients had been reviewed by clinical interview six months after urethrolysis or tape section. Free flowmetry and residual volume measurement had also been performed.

Initially, in the current review, an analysis of the medical condition through a medical interview was carried out, taking into consideration the persistence, improvement or disappearance of storage and voiding symptoms and the presence of stress and urge incontinence.

Patients were then asked to complete three different validated questionnaires:⁹⁻¹⁰

1. - Degree and type of incontinence (SUIQ).
2. - Incontinence Quality of Life (I-QoL).
3. - Patient Global Impression of Improvement (PGI-I).

Following this, an objective appraisal was carried out: stress incontinence was evaluated with a full bladder in supine and standing positions. Patients were asked to cough and to perform a Valsalva maneuver. Free flowmetry and echographic measurement of residual urine volume were then performed.

The clinical variables obtained following incontinence surgery were compared with those obtained six months post-urethrolysis or tape section. These were compared with the clinical variables collated in the current revision.

TABLE 1. – Clinical characteristics and urodynamic parameters previously and later SUI surgery.

Parameter	Previously SUI surgery		Later SUI surgery	
	Group I	Group II	Group I	Group II
Urgency (n, %)	4 (44%)	4 (40%)	8 (88%)	9 (90%)
Urge urinary incontinence (n, %)	2 (22%)	3 (30%)	7 (77%)	8 (80%)
Daytime frequency of urination (h)†	2±1.4	1.8±0.7	1.5±1.3	1.8±1
Hesitancy (n, %)	0	0	4 (44%)	7 (70%)
Straining (n, %)	0	0	7 (77%)	9 (90%)
Frank retention (n, %)	0	0	1 (11%)	1 (10%)
Urethral overcorrection on physical exam (n, %)	0	0	9 (100%)	9 (90%)
Urethral angulation on cystoscopy (n, %)	0	0	9 (100%)	10 (100%)
Stress incontinence on physical exam (n, %)	9 (100%)	10 (100%)	0	0
Q _{max} (ml/s)†	20.3±7.5	18±6.2	11.5±5.3	9.5±3.6
V _u (ml)†	289.6±77.6	341.3±91.7	175.8±58.5	202.7±88.7
V _r over 100 ml (n, %)	0	0	3 (33%)	7 (70%)
P _{det.Q_{max}} (cmH ₂ O)†	–	–	44.7±4.3	38.3±18.1

Q_{max}: maximum flow rate; V_u: voided volume; V_r: residual volume; P_{det.Q_{max}}: detrusor pressure at maximum flow; † Median ± SD; Group I: conventional surgery (n =9); Group II: tension-free vaginal tape (n = 10).

The relationship between the variables including age, the surgical technique for incontinence, post-urethrolysis urgency, stress incontinence and maximum flow rate post-urethrolysis with I-QOL quality of life questionnaire were assessed.

Descriptive statistical analysis of the study was conducted using the data processing package SPSS 12.0. Quantitative and qualitative variables were analyzed via the statistical Student-t and Chi-Square tests, respectively, and a value of P < 0.05 was considered as statistically significant. Comparability between the medical history and the administered questionnaires was evaluated using the kappa test. Finally, univariate analyses were performed using the Spearman correlation coefficient to determine potential associations between the different variables derived from the I-QOL questionnaire. Multivariate logistic regression was not carried out due to the number of independent variables analyzed, a larger sample size would be necessary to obtain significant results.

RESULTS

Table 2 illustrates symptomatology, as collected from the medical chart and objective parameters of both groups six months and at the current visit after urethrolysis or tape sectioning.

A clear clinical improvement is evident with regards to the eradication or improvement of both storage and voiding symptoms six months after urethrolysis and tape sectioning. Significant differences were also evident for maximum flow after urethrolysis (p = 0.035) and after tape sectioning (p = 0.014). Residual volume also disappeared in all patients presenting it previously. Stress incontinence appeared in four patients, one in group I and three in group II.

The clinical improvement obtained at six months was maintained at the current visit, and there was no significant difference in maximum flow rate in the urethrolysis group (p = 0.136) nor in the tape section group (p = 0.870). The absence of residual volume was equally maintained.

Table 3 presents the results obtained from the SUIQ questionnaire, determining the presence of continence or incontinence (urge or stress). Incontinence was classified as fewer

TABLE 2. – Clinical characteristics and urodynamic parameters later urethrolysis and tape section.

Parameter	Six months postoperative visit		Current postoperative visit		value of P ‡
	Group I	Group II	Group I	Group II	
Eradication of urgency (n, %)	1 (12%)	6 (66%)	0	7 (77%)	0.001
Improved urgency (n, %)	7 (87%)	3 (33%)	7 (87%)	2 (22%)	–
Persistent urge urinary incontinence (n, %)	5 (71%)	3 (37%)	6 (75%)	2 (25%)	0.001
Daytime frequency of urination (h)†	2±0.7	2.8±0.4	2.3±0.8	3.2±0.6	0.038
Eradication of hesitancy (n, %)	4 (100%)	6 (85%)	4 (100%)	6 (85%)	n.s.
Eradication of straining (n, %)	6 (85%)	7 (77%)	6 (85%)	8 (88%)	n.s.
Frank retention (n, %)	0	0	0	0	n.s.
Stress incontinence on physical exam (n, %)	1 (11%)	3 (30%)	1 (11%)	3 (30%)	n.s.
Q _{max} (ml/s)†	12.4±7.8	21±9.3	15±6.1	20.2±9.3	0.014
V _u (ml)†	219.5±93.5	216.3±85.8	234.5±99.6	194.5±94.6	n.s.
V _r over 100 ml (n, %)	0	0	0	0	n.s.

Q_{max}: maximum flow rate; V_u: voided volume; V_r: residual volume; † Median ± SD; ‡ Comparison of both groups at current postoperative visit; Group I: conventional surgery (n =9); Group II: tension-free vaginal tape (n = 10).

TABLE 3. – Postoperative questionnaires results.

Questionnaire	Score / Scale	Group I (n, %)	Group II (n, %)
SUIQ	Stress urinary incontinence (weekly episodes)		
	0	8 (88%)	7 (70%)
	< 5	0	0
	5-15	1 (11%)	2 (20%)
	>15	0	1 (10%)
	Urge urinary incontinence (weekly episodes)		
	0	0	5 (50%)
	< 5	6 (66%)	1 (10%)
	5-15	1 (11%)	4 (40%)
	>15	2 (22%)	0
I-QOL	86-100	3 (33%)	5 (55%)
	71-85	1 (11%)	3 (30%)
	56-70	0	1 (10%)
	0-55	5 (55%)	1 (10%)
PGI-I	Greatly improved	2 (22%)	4 (40%)
	Sufficiently improved	3 (33%)	3 (30%)
	Slightly improved	3 (33%)	3 (30%)
	Unchanged	1 (11%)	0
	Worse	0	0

SUIQ: Stress and Urge Incontinence Questionnaire; I-QOL: Incontinence Quality of Life Questionnaire; PGI-I: Patient Global Impression of Improvement.

than 5, between 5 and 15 and more than 15 episodes per week. It also presents the results from the other questionnaires: I-QOL: maximum score was 100 points, representing the best result. Answers were classified arbitrarily into four groups: from 100 to 86, from 85 to 71, from 70 to 56 and less than 55. PGI-I: answers are classified as greatly improved, sufficiently improved, slightly improved or unchanged. No patient reported worsening of their condition following intervention.

There was a high level of agreement between the results obtained from the medical histories and the results of the SUIQ questionnaire concerning stress urinary incontinence ($kappa$ 1). The level of agreement was lower when urge urinary incontinence was taken into account ($kappa$ 0.503).

Univariate analysis indicated a negative correlation between the presence of postoperative urgency and I-QoL scores (Spearman Rho Coef. 0.399; $p = 0.045$), with further evidence for a correlation, although positive, between the postsurgical maximum flow rate and I-QOL scores (Spearman Rho Coef. 0.508; $p = 0.016$).

DISCUSSION

Surgery for stress incontinence, whether it involves standard techniques or tension-free vaginal tape (TVT), causes obstructive voiding dysfunction in a varying proportion of cases.^{1,3-5} A minor obstruction, causing minimal or no symptomatology, is possibly evoked with even greater frequency. A significant decrease in maximum flow rate following the implantation of TVT has been described, at below 12 ml/s one year after surgery in 34.5% of cases.³ Why urination is compensated, and rarely symptomatic, in some cases and in others leaves the patient with irritation and/or considerable residual volume is unknown. It possibly depends, at least in part, on the balance between the degree of obstruction and the contractile capacity of the detrusor. The long-term consequences of subclinical obstruction are not known.¹¹

The diagnosis of urinary obstruction in women is difficult, and no universally accepted urodynamic criteria exist. When it appears following incontinence surgery, the diag-

nosis is fundamentally based on a clear correlation with the surgical antecedent and the timing of symptom manifestation.¹² Furthermore, urodynamics alone is unreliable for predicting the outcome of urethrolisis.¹³⁻¹⁵ In accordance with this, our study did not use urodynamic criteria alone. In all patients, voiding or storage symptoms occurred immediately after surgery. The diagnosis was also supported by a clear reduction of maximum flow rate, the presence of residual volume, in some cases by a relatively increased detrusor pressure, and by urethral angulation.

Maximum average flow following urethrolisis or tape sectioning was significantly increased and residual urine eliminated in all cases six months after surgery. This confirms the presence and subsequent healing or improvement of an obstruction. However, maximum flow rate was increased more in cases of tape section than in cases of urethrolisis. It therefore seems that tape section, in our cases at least, is better at relieving obstruction than urethrolisis.

Voiding symptoms disappeared in all but three cases of every group, which are very difficult to explain as the maximum flow rate in these patients changed from 9.5 (6-13) to 17 (10-25) and the residue was eliminated in all cases.

In patients receiving standard surgery, according to the medical history, urgency was completely abolished in 12% (1/8) of cases with relief evident in 87% (7/8). In the suburethral tape group, urgency was totally eliminated in 66% (6/9) with improvements seen in 33% (3/9). Similar results can be found in the literature, according to the evaluation of clinical history. Cross et al. reported an 85% relief of urge incontinence upon conventional urethrolisis.¹⁶ Long et al., on the other hand, achieved complete symptom relief in 86% of their patients and an improvement in the remainder by performing a lateral sectioning of the TVT.¹⁷

The persistence of urgency can be attributed to persistence of obstruction, either due to insufficient release, or new adhesions in the case of retropubic urethrolisis. Scarpero et al., however, observed, in 23 second urethrolisis the abolition of obstructive symptoms in 92% and a complete interruption of urgency in only 12%. Covering the retropubic space with the omentum did not affect the results.⁸ In our study, the complete eradication of residual volume, a considerable increase in maximum flow rate, and the non-variation of voiding symptoms over the years make this an improbable diagnosis. The persistence of urgency possibly depends, not only on obstruction, but also on damage to small nerve branches or urethral inflammation caused by the tape in the case of TVT.¹⁸ Potential damage to small pelvic nerve branches, due to a more aggressive surgery, could explain the persistence of urge urinary incontinence in a larger percentage of patients undergoing retropubic procedures.

Leng et al. have suggested a relationship between the time until urethrolisis and persistence of symptoms after the same.¹⁸ The difference in time intervals in our cases and the reduced number of cases make it impossible to analyze this variable.

Clinical symptomatology, maximum flow rate, and the presence or absence of residual volume have remained constant over time with minimal worsening of urgency in one case in group I and improvement in another case in group II. This suggests that the effects of urethrolisis and tape sectioning are durable. However, they have been reported to subside within two years,⁸ therefore care should be taken.

The evaluation via questionnaires shows poorer results than the clinical history. The SUIQ questionnaire which defines whether incontinence exists, as well as its type and intensity, shows that 14 women continue to suffer from urge urinary incontinence, a figure much higher than 8 as

revealed by clinical history. Neither are the results accordant with those of the clinical evaluation when the impact on quality of life is examined and therefore patient satisfaction is taken into account. The I-QOL which quantifies, with a maximum of 100 points, the impact of the varying symptoms on the perception of quality of life, revealed that five of the six women who presented with improved urgency according to their medical history had a score of below 56 out of 100 points, signifying an important impact on their quality of life. It seems that medical history tends to minimize the importance of urgency for the patients.

The divergence between the clinical results interpreted by the medical and the subjective perception of the patient clearly indicate the need to include the quality of life questionnaires in the evaluation of surgical outcome. The variation in questionnaire scores before and after urethrolysis or tape section are important parameters to be taken into consideration.

Tape section has had a more positive impact on quality of life than urethrolysis; 50% of patients in group II scored above 85 in the I-QOL questionnaire and 70% felt sufficiently or greatly improved according to the PGI-I questionnaire in contrast to 33% and 55% respectively in group I. The suburethral tape appears to clearly produce obstruction when excessive tension is applied and this seems to be the fundamental cause of the presence of symptoms in this clinical group. In the clinical group of patients undergoing classic surgery it is possible that other factors related to the more aggressive techniques are also of great influence.

Persistence of urgency following surgery exhibited a slightly negative correlation with quality of life following univariate analysis. Maximum flow rate results also display a trend, in this case positive, with quality of life. In both cases, a larger sample and a multivariate study are necessary for this to be confirmed.

Stress urinary incontinence was evident in 11% of the cases in group I and in 30% in group II already at six months follow-up. Two of these have been satisfactorily treated using the TOA procedure.¹⁹ The rest of the patients had remained stress continent throughout.

The current tendency is not to carry out a new anti-incontinence procedure following urethrolysis or tape section.^{4, 20} We believe that it is important to solve the problem of obstruction and not to risk provoking it further.

CONCLUSIONS

Urethrolysis and tape sectioning can be highly successful to relieve iatrogenic obstruction and seems to be long-lasting. Complete resolution of storage symptoms is less likely. Quality of life questionnaires before and after surgery are necessary for a proper evaluation of the outcome of urethrolysis and tape section.

KEY OF DEFINITIONS FOR ABBREVIATIONS

I-QOL: Incontinence Quality of Life Questionnaire; $P_{det, Q_{max}}$: detrusor pressure at maximum flow; PGI-I: Patient Global Impression of Improvement; Q_{max} : maximum flow rate; SUIQ: Stress and Urge Incontinence Questionnaire; TOA Trans-obturator adjustable tape; TVT: Tension-free vaginal tape; V_r residual volume; V_u voided volume.

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