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EFFECT OF TRANSOBTURATOR MID-URETHRAL SLING ON THE VOIDING PHASE IN WOMEN WITH STRESS URINARY INCONTINENCE AND DETRUSOR UNDERACTIVITY

Hypothesis / aims of study

Primary objective of this original study was to evaluate preoperative detrusor underactivity (DU) as an indicator of voiding dysfunctions in women with stress (SUI) or mixed urinary incontinence (MUI) with predominant stress component who underwent transobturator mid-urethral sling (TOT). Our secondary objective was to evaluate DU effects on continence and Quality of Life (QoL) outcomes.

Study design, materials and methods

This is a prospective, case-control study performed in a high-volume urogynaecological centre. From September to December 2015 all consecutive patients who were submitted to TOT in the period May 2007 to October 2013 were recalled and reavaluated. DU were established on the basis of preoperative urodynamic test and the patients were divided in 2 groups: with or without DU. Detrusor contractility was assessed using the PIP index [detrusor pressure at maximum flow rate (PdetQmax) + maximum flow rate (Qmax)] with values of 30-75cmH_2O indicating normal detrusor contractility (1). All the patients underwent standardized pre-op urogynaecological work-up including: urogynecological history; pelvic examination (POP-Q classification); cough stress test; voiding and storage symptoms evaluation using a structured questionnaire and SUI classification according to Ingelmann-Sundberg scale; conventional urodynamic study (definition and terms by ICS standardization) (2). They also filled the The King's Health questionnaire (KHQ) for QoL; the short forms of Incontinence Impact Questionnaire (IIQ-7) and Urinary Distress Inventory (UDI-6) for urinary symptoms, including incontinence (3). All patients underwent TOT (Monarc® Subfascial Hammock - American Medical Systems, Minnetonka, MN). After TOT surgery a Foley catheter was left in place for 24 hours. The post-void residual (PVR) was then evaluated and if post-void residue (PVR) was >100ml for more than 48 hours patients underwent medical therapy with alfa-litic drugs and intermittent catheterization. Follow-up assessment was carried-out by blinded physicians unaware of pre-operative urodynamic data. The postoperative rate of continence, was evaluated objectively, using a standardised Cough Stress Test (CST). The subjective cure rate was evaluated using the Patient Global Impression of Improvement (PGI-I). The KHQ was used to evaluate QoL. Urodynamics with pressure/flow study was performed. For statistical analysis the McNemar chi-square test and the paired t-test test were used at a significance level of 0.05.

Results

140 patients were recalled and 100 accepted the follow-up evaluation and were included in this study: 50 in the DU group and 50 in the normocontractility (control) group. The mean follow-up was 47 months (range 26-100 months). No significant differences were found between the groups in terms of demographic and clinical data (Table 1). Also voiding symptoms were not significantly different in the DU group. No significant difference emerged in the urodynamic findings, except for DU.

Table 1- Demographic data in the undercontractility and in the normocontractility group

	DU group	Control group	p
Age - years mean±SD	60.19±10.80	58.30±10.56	0.3776
Parity - median (range)	2 (0-4)	2 (0-6)	0.0872
BMI - mean±SD	26.43±4.18	26.43±4.16	0.9978
Menopause - N (%)	37 (74)	32 (64)	0.7640
UUI - N (%)	23 (46)	33 (66)	0.4908
0bj. SUI N (%)	Stage 0 0 Stage 1 10 (20) Stage 2 31 (62) Stage 3 9 (18)	Stage 0 0 Stage 1 5 (10) Stage 2 27 (54) Stage 3 18 (36)	1.0000
UUI N (%)	23 (46)	33 (66)	0.4908
Urgency N (%)	29 (58)	36 (72)	0.1024
Voiding symptoms N (%)	9 (18)	7 (14)	1.0000

9 patients in the DU group and 2 patients in the control group needed post-operative intermittent catheterization. In the DU group 6 out of the 9 patients had complete resolution (within 2 weeks in 4 patients and 1 month in 2 patients). Only 3 patients had a persistent PVR which resolved in 2 patients after a mesh incision and in 1 patient after TOT removal. In the control group the 2 patients with persistent RPM completely resolved within 7 days and 1 months respectively and no further surgery needed.
Table 2 shows post-operative functional results in both groups.

Table 2- Post-op functional results in the two groups

	DU group	Control group	p
SUI - N (%)	Stage 0 41 (82) Stage 1 7 (14) Stage 2 2 (4) Stage 3 0	Stage 0 42 (84) Stage 1 8 (16) Stage 2 0 Stage 3 0	1.0000

Subjective SUI N (%)	39 (78)	42 (84)	0.1075
UUI N (%)	9 (18) *(2 de novo)*	6 (12) *(1 de novo)*	0.5791
Urgency N (%)	13 (26) *(3 de novo)*	13 (26) *(1 de novo)*	0.9841
Voiding symptoms N (%)	18 (36)	8 (16)	0.0339
De novo voiding symptoms N (%)	14 (28)	1 (2)	0.0016

Post-operative voiding symptoms (VS) and de novo VS were statistically higher in the DU group.
Pre- and post-op urodynamic data in both groups are showed in Table 3.

Table 3 – Pre- and post-op urodynamic data in the DU and control group

	DU group			**Control group**		
	pre-op	post-op	p	pre-op	post-op	p
Cystometric capacity ml mean±SD	381.8±79	365.1±59.7	0.4245	345.8±63.4	355±79.8	0.5532
Detrusor overactivity N (%)	4 (8)	3 (6)	0.5637	5 (10)	7 (14)	0.2123
PdetQmax cmH_2O mean±SD	10.6±5.2	17.6±9	0.0016	13.4±8.1	18.2±11.2	0.0022
PIP mean±SD	25.5±3.4	33.6±9.7	0.09	36.9±8.4	38.9±6.4	0.98

In both groups Pdet Qmax have a statistically significant increase after TOT treatment; no obstruction was observed according to the Blaivas-Groutz nomogram. The KHQ showed a statistically significant improvement in all domains of QoL in both groups.

Interpretation of results

Surprisingly pre-operative voiding symptoms were not significantly different in DU and control group (18% vs 14%, respectively). A low incidence of VS in SUI patients is reported and we can hypothesize the physiopathological mechanism of incontinence with the underlying sphincteric deficiency, could lead to lower values of detrusor pressure during micturition. Furthermore, after TOT surgery, we observed a significant increase of post-op and *de novo* VS in the DU group with higher re-operation rate for persistent PVR (6% vs 0%). These data confirms the role of pre-operative urodynamic evaluation (including the pressure/flow study) as a good tool to detect patients with higher risk of post-operative VS and higher reoperation rate.

Concluding message

Our data suggest that, in DU patients, TOT showed good results in terms of continence but may adversely affect the outcome regarding voiding phase of micturition. A pre-op urodynamic study is useful to evaluate detrusor contractility and consequently to counsel the patients on the higher risk of VS, de novo VS and reoperation rate.

References

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