Influence of sling operation on nocturia in patients with mixed urinary incontinence

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Hypothesis / aims of study

- We assessed the impact of transobturator tape (TOT) treatment on overactive bladder (OAB) symptoms, particularly focused on nocturia in patients with mixed urinary incontinence (MUI).

Study design, materials and methods

- In this retrospective cohort study, the medical records of 237 patients who underwent TOT surgery for treating women with MUI were reviewed.
- Of these, 86 (36.4%) patients had preoperative nocturia.
- Patients with neurological diseases or sleep disorders that could affect the voiding pattern were excluded.
- Patients who were being treated with anticholinergics and antidiuretic hormones were also excluded and finally 70 subjects eligible for analysis.
- Pre- and postoperative evaluations consist of physical examination, 3 day frequency-volume charts and health-related quality of life questionnaires (King's Health Questionnaire, OABSS and OAB-questionnaire).

Results

- TOT resulted in an overall significant improvement in OAB symptoms including nocturia.
- Frequency-volume charts revealed that TOT significantly decreases the actual number of nightly voids (ANV) and nocturnal bladder capacity index (NBCi) in the entire cohort.
- However, in a subgroup of women with nocturnal polyuria, there was no significant change in ANV or NBCi after sling operation.
- Correlation analysis of the whole cohort revealed that the postoperative changes in NBCi correlated positively with postoperative changes in ANV.
- The nocturia-persisting group was more likely to have a nocturnal polyuria and a lower preoperative functional bladder capacity than nocturia-improved group (*P*=0.024 and *P*=0.023, respectively).

Table 1. Pre- and post-operative changes of Overactive Bladder Symptom Score after TOT in female MUI.

Variables	Preoperative	Postoperative	Change	P-value
Daytime frequency	1.37 ± 0.64	0.78 ± 0.74	0.59 ± 0.91	< 0.001
Nocturia	2.02 ± 0.92	0.88 ± 0.48	1.14 ± 0.94	< 0.001
Urgency	2.46 ± 1.35	1.25 ± 1.48	1.21 ± 1.98	< 0.001
Urgency incontinence	1.92 ± 1.54	0.67 ± 1.29	1.25 ± 1.95	< 0.001

Table 2. Nocturia symptom changes after TOT in female MUI.

Variables	Preoperative	Postoperative	P-value
HRQoL questionnaires			
KHQ sleep/energy score	51.04 ± 30.44	18.40 ± 22.08	< 0.001
OAB-q sleep score	47.71 ± 26.22	85.57 ± 14.04	< 0.001
3 day frequency-volume chart			
24hr urine volume (mL)	1605.26 ± 472.98	1550.67 ± 485.39	0.470
24hr total void number	10.27 ± 2.71	7.66 ± 2.35	< 0.001
Daytime frequency	8.60 ± 2.45	6.76 ± 2.00	< 0.001
MVV	367.38 ± 115.17	371.86 ± 117.87	0.669
ANV	1.68 ± 0.80	0.90 ± 0.82	< 0.001
NUV	511.57 ± 165.73	478.46 ± 171.33	0.235
NPi	0.34 ± 0.11	0.32 ± 0.11	0.366
Ni	1.71 ± 0.47	1.71 ± 0.57	0.880
NBCi	0.45 ± 0.67	0.01 ± 0.55	< 0.001

Table 3. Change in actual number of nightly voids according to severity and type of nocturia after TOT in female MUI.

Variables	ANV		P
	Preoperative	Postoperative	
Nocturia severity			
Mild (1 ≤ preop. ANV < 2) (n=28)	1.20 ± 0.26	0.72 ± 0.69	< 0.001
Moderate (2 ≤ preop. ANV < 3) (n=32)	2.23 ± 0.28	0.99 ± 0.78	0.001
Severe (preop. ANV ≥ 3) (n=10)	3.42 ± 0.46	1.78 ± 1.13	0.043
Nocturia type			
Nocturnal polyuria (n=17)	1.42 ± 0.68	1.33 ± 1.13	0.593
Reduced nocturnal bladder capacity (n=21)	1.73 ± 0.89	0.73 ± 0.52	< 0.001
Mixed (n=32)	1.77 ± 0.80	0.79 ± 0.74	< 0.001

Table 4. Change in nocturnal bladder capacity index according to severity and type of nocturia after TOT in female MUI.

Variables	NBCi		P
	Preoperative	Postoperative	
Nocturia severity			
Mild (1 ≤ preop. ANV < 2) (n=28)	0.12 ± 0.30	- 0.08 ± 0.38	0.026
Moderate (2 ≤ preop. ANV < 3) (n=32)	0.69 ± 0.70	0.08 ± 0.67	0.019
Severe (preop. ANV ≥ 3) (n=10)	1.26 ± 0.82	0.20 ± 0.81	0.018
Nocturia type			
Nocturnal polyuria (n=17)	0.29 ± 0.71	0.13 ± 0.56	0.285
Reduced nocturnal bladder capacity (n=21)	0.62 ± 0.69	0.06 ± 0.48	0.028
Mixed (n=32)	0.43 ± 0.63	- 0.08 ± 0.59	0.001

Table 5. Comparison of the preoperative clinical and urodynamic features of the nocturia-improved and -persisting groups.

Preoperative variables	Nocturia-improved group (n= 39)	Nocturia-persisting group (n= 31)	P
Age (years) (range)	53.94 ± 8.29	54.14 ± 8.44	0.910
BMI (kg/m^2)	25.43 ± 4.00	25.42 ± 2.45	0.685
Nocturia type (%)			0.024
Nocturnal polyuria	4 (10.3)	13 (41.9)	
Reduced NBC	15 (38.5)	6 (19.4)	
Mixed	20 (51.3)	12 (38.7)	
Symptom grade (%)			0.319
Grade I	12 (30.8)	14 (45.2)	
Grade II	27 (69.2)	17 (54.8)	
Urodynamic study			
DO (%)	21 (53.8)	20 (64.5)	0.466
VLPP (mmHg)	88.62 ± 27.96	84.04 ± 24.64	0.395
MUCP (mmHg)	52.15 ± 23.04	50.96 ± 18.82	0.911
FUL (cm)	3.37 ± 0.55	3.61 ± 0.54	0.088
Preop. frequency-volume chart			
24 h urine volume (mL)	1605.09 ± 467.00	1493.75 ± 412.12	0.418
Daytime frequency	8.28 ± 2.38	9.10 ± 2.23	0.152
MVV	403.78 ± 116.44	329.23 ± 70.02	0.023
ANV	1.52 ± 0.66	1.77 ± 0.83	0.251
NUV	506.13 ± 163.82	489.62 ± 178.08	0.601
NPi	0.34 ± 0.12	0.33 ± 0.09	0.983
Ni	1.64 ± 0.44	1.67 ± 0.41	0.732
NBCi	0.38 ± 0.65	0.50 ± 0.67	0.468

Interpretation of results

- Over half of the patient (55.7%) achieving an improvement of nocturia after TOT. Patients with pure NP did not experience significant improvement in their nocturia.
- Improvement in nocturnal bladder capacity after TOT treatment may be attributed to a reduction in episodes of nocturia.

Concluding message

- Our results demonstrated that the TOT procedure resulted in an overall significant improvement in overactive bladder symptoms including OAB-related nocturia in patients who present MUI.

- Disclosures statement: none