

THE EFFECT OF MIDURETHRAL SLINGS ON PERSISTENCE OF URGENCY AND URGENCY URINARY INCONTINENCE IN WOMEN WITH MIXED URINARY SYMPTOMS

Hypothesis / aims of study

Mixed urinary incontinence (MUI) is common, with an estimated prevalence of 30% of all women with urinary incontinence, and is more bothersome than pure stress urinary incontinence (SUI) (1). Although midurethral sling (MUS) procedures are generally very effective in treating SUI, there is a concern these procedures might aggravate the urgency component and consequently patient dissatisfaction. We aim to determine the independent risk factors for *persistence* of urgency (*pU*) or *persistence* of urgency urinary incontinence (*pUUI*) following MUS procedures.

Study design, materials and methods

We prospectively assessed 754 consecutive women who presented with MUI, all of whom underwent MUS surgery from May 1999 till Aug 2007, with a mean follow up of 50 months. Consent was obtained from women together with approval from the local ethics committee. Comprehensive history comprised of demographics, medical history, symptoms of lower urinary tract and pelvic floor dysfunction, followed by full physical examination, urodynamics and surgical reports, recorded on a detailed proforma. *pU* or *pUUI* is defined as occurring in those women who presented initially with SUI and urinary urgency OR urgency urinary incontinence AND continue to have urinary urgency or urgency urinary incontinence, respectively at long term follow up. Women who defaulted from follow up were interviewed via telephone using structured questionnaires derived from Urogenital Distress Inventory (2). Clinical data were separated according to presence or absence of (i) *pU* (n=754); (ii) *pUUI* (n=514). Chi-square tests, independent t tests, and ANOVA tests were used to compare the two groups (presence vs. absence of *pU* or *pUUI*) by baseline characteristics and clinical factors. Clinical parameters possibly associated with each of above factors were assessed using multiple logistic regression analysis with stepwise building of an optimal model for prediction. Receiver operator curve (ROC) was performed for calculated probabilities from the final model.

Results

The mean age was 60.6±12.8 years. The overall subjective rate for *pU* & *pUUI* was 40.3% & 32.30% respectively. The mean follow-up was 218.1±105.3 weeks. Results of univariate analysis of clinical parameters are summarised in Table 1, with Table 2 summarising the independent risk factors for developing *pU* or *pUUI*. Length of follow up, menopausal status, use of HRT, parity, cystometric capacity, volume at first sensation, urodynamic intrinsic sphincter deficiency, level of surgical experience, type of anaesthesia, presence of intraoperative bladder perforation, use of mesh for prolapse surgery, were not significant risk factors (*p*>0.05). Multivariate analysis showed that urodynamic detrusor overactivity (DO), and baseline bothersome urgency confers significant odds towards *pU* and *pUUI* post MUS. Previous SUI surgery, diabetes and presence of apical prolapse confer significant odds towards *pUUI*. Transobturator sling, concomitant prolapse surgery and apical prolapse surgery confers inverse odds towards developing *pU* and *pUUI* respectively, following MUS.

Interpretation of results

Presence of urodynamic DO, bothersome urgency, previous SUI surgery, history of diabetes and presence of apical prolapse significantly increase the risks of women having *pU* or *pUUI* post MUS. Use of transobturator (TO) sling and concomitant prolapse surgery protects against *pU* or *pUUI* following MUS. The ROC for *pU* and *pUUI* indicate the model is a good fit with area under curve of 0.6782 and 0.6960 respectively.

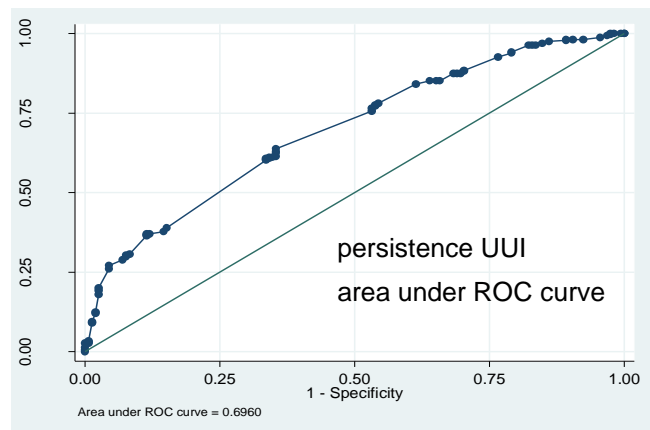
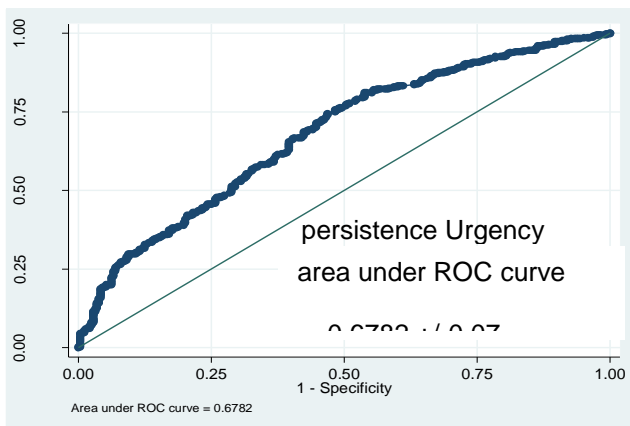
Concluding message

Urodynamic DO, bothersome urgency, previous SUI surgery, history of diabetes and apical prolapse significantly increases, whereas TO sling and concomitant prolapse surgery decreases the risk of women having persisting overactive bladder symptoms following MUS.

Table 1. Univariate analysis of risk factors for <i>persistence</i> of Urgency or <i>persistence</i> of Urgency Urinary Incontinence							
<i>persistence</i> Urgency	n=304 (%)	n=450 (%)	p value	<i>persistence</i> UUI	n=166 (%)	n=348 (%)	p value
n=754	<i>pU</i>	No <i>pU</i>		n=514	<i>pUUI</i>	No <i>pUUI</i>	
Age (yrs) Mean ±SD	63.6 ±12.3	58.7 ±13.0	<0.0001	Age (yrs) Mean ±SD	63.6 ±11.9	59.4±13.4	0.472
Follow up (wks) M ±SD	209.3±102	222.8±108	0.079	Follow up (wks) M ±SD	228.2±110	218.9±105	0.504
SUI & Urgency	223 (73.4)	264 (58.7)	<0.0001	SUI & UUI	154 (92.7)	333 (95.7)	
U & UUI only	13 (4.3)	14 (3.1)		U & UUI only	12 (7.2)	15 (4.3)	0.165
Bothersome Urgency	227 (74.7)	274 (60.9)	<0.0001	Bothersome Urgency	134 (86.5)	219 (65.6)	<0.0001
Diabetes Mellitus	39 (12.8)	38 (8.4)	0.051	Diabetes Mellitus	27 (16.3)	25 (7.2)	0.001
Prev SUI surgery	64 (21.1)	66 (14.7)	0.023	Prev SUI surgery	43 (25.9)	49 (14.1)	0.001
Prev Burch Colpo	40 (13.2)	46 (10.2)	0.214	Prev Burch Colpo	28 (16.8)	29 (8.3)	0.004
Prev Sling	24 (7.9)	20 (4.4)	0.047	Prev Sling	15 (9.0)	20 (5.8)	0.166
BMI Mean ±SD	28.6 ±4.4	27.3 ± 4.0	<0.0001	BMI Mean ±SD	26.5 ±4.0	28.4 ±4.8	0.001
BMI >30	95 (31.3)	109 (24.2)	0.04	BMI >30	63 (38.0)	86 (24.7)	0.021
Apical Prolapse	178 (58.6)	263 (58.4)	0.475	Apical Prolapse	86 (51.8)	209 (60.1)	0.083
Apical POP /Apical Op	25 (8.3)	47 (10.4)	0.107	Apical POP / Apical Op	8 (4.8)	40 (11.5)	0.015

Capacity(ml) Mean ±SD	459.2±94.5	456.2±76.2	0.462	Capacity(ml) Mean ±SD	454.2±92.1	458.0±80.6	0.455
1 st Sens (ml) Mean ±SD	239±101.7	241±107.5	0.743	1 st Sens (ml) Mean ±SD	237±108.4	247±109.8	0.653
ISD	44 (14.5)	67 (14.9)	0.875	ISD	27 (16.3)	48 (13.8)	0.458
USI & DO	88 (29.0)	60 (13.3)	<0.0001	USI & DO	56 (33.7)	69 (19.8)	0.003
Q<15 &/or PVR>50	46 (15.1)	45 (10.0)	0.037	Q<15 &/or PVR>50	28 (16.9)	45 (12.9)	0.254
Repeat SUI Surgery	58 (19.1)	63 (14.0)	0.062	Repeat SUI Surgery	39 (23.5)	46 (13.2)	0.003
Retropubic MUS	256 (84.2)	359 (79.8)		Retropubic MUS	138 (83.1)	299 (85.9)	
Transobturator MUS	48 (15.8)	91 (20.2)	0.124	Transobturator MUS	28 (16.9)	49 (14.1)	0.408
MUS alone	194 (63.8)	249 (55.3)		MUS alone	105 (63.3)	194 (55.8)	
MUS & POP Surgery	110 (36.2)	201 (44.7)	0.02	MUS & POP Surgery	61 (36.8)	154 (44.3)	0.107
Vault suspension	28 (9.2)	63 (14.0)	0.048	Vault suspension	9 (5.4)	50 (14.4)	0.003
Would Not recommend Surgery to friend	48 (15.8)	12 (2.7)	<0.0001	Would Not recommend Surgery to friend	41 (24.7)	10 (2.9)	<0.0001

Table 2. Multivariate analysis – independent risk factors for persistence of Urgency or persistence of UUI							
persistence of Urgency	OR	95%CI	p value	persistence of Urgency UI	OR	95%CI	p value
Urodynamic USI&DO	2.04	1.39 – 3.01	<0.0001	prev SUI surgery	2.18	1.28 - 3.70	0.004
baseline degree of bothersome urgency	1.41	1.10 – 1.78	0.006	diabetes Mellitus	2.02	1.07 - 3.85	0.03
Baseline LUT - SUI & Urgency	1.28	1.05 – 1.56	0.014	baseline degree of bothersome urgency	1.88	1.38 - 2.56	<0.0001
Age	1.03	1.02 – 1.04	<0.0001	Urodynamic USI&DO	1.86	1.18 - 2.93	0.008
Transobturator Sling	0.61	0.39 – 0.94	0.024	baseline LUT - U/UUI only	1.6	1.17 - 2.18	0.003
Concomitant POP surgery	0.54	0.38 – 0.75	<0.0001	apical prolapse	6.49	6.49 - 34.48	0.027
				Apical POP / Apical Operation	0.33	0.15 - 0.70	0.005



References

1. Dooley Y, Lowenstein L, Kenton K et al. Mixed incontinence is more bothersome than pure incontinence subtypes. Int Urogynecol J Pelvic Floor Dysfunct 2008;19:1359–1362
2. Coyne KS, Zhou Z, Thompson C, Versi E. The impact on health-related quality of life of stress, urge and mixed urinary incontinence. BJU Int. 2003; 92(7):731-5.

Specify source of funding or grant	None
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Human Research Ethics Committee, Mercy Hospital for Women
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes