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Could the transperineal ultrasound predict the trans-obturator midurethral sling failure?

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Introduction and aim of the study

After midurethral synthetic slings (MUS) for the surgical treatment of stress urinary incontinence (SUI), 5-23% of patients will have persistent or recurrent urinary incontinence (1). Several risk factors have been investigated, including age, obesity, previous anti-incontinence surgery, and concomitant prolapse surgery. However more recently, tape position relative to the urethra has been investigated as an etiology for recurrent SUI after MUS.

Aim of the study was to evaluate if the trans-perineal ultrasonography is able to recognize improper positioning or dislodgment of the tape or other factors that may be associated with failed surgery, in patients who underwent trans-obturator midurethral sling (TOT).

Materials and methods

This was a single-center prospective series of women who underwent TOT for SUI. The local ethics committee approved the study and patients signed an informed consent document

Ultrasound was performed with the woman in the supine position, with a full comfortable bladder, at rest and then during maximum Valsalva manoeuvre using 3.5-5 MHz curved array probes.

All patients were preoperatively evaluated with history, clinical examination, and urodynamic testing and transperineal ultrasound (TPU). All surgical procedures were performed by one senior surgeon. Patients were followed up at 1, 3, 6, and 12 months after surgery, and then annually. At each visit, patients underwent clinical examination, evaluation of urinary symptoms, uroflowmetry with PVR measurement and transperineal ultrasound at 6 months after surgery.

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We recorded the measurement above and below the longitudinal axis of the symphysis as negative and positive, respectively.

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Results

From December 2012 to February 2016 80 women underwent TOT for SUI. Median follow-up was 36 months (range 12-62).

64 dry

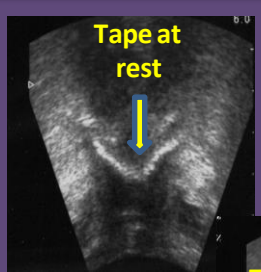
16 wet

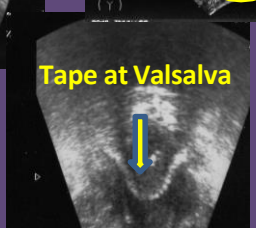
On the basis of the incontinence outcome patients were allocated into two main categories: dry (no leakage during clinical and/or stress test and/or reported by patients) vs. wet. We considered wet the patients with any kind or grade of leakage

Ultrasound parameters	Continent patients (64)	Incontinent patients (16)	P value
Post-operative open bladder neck	13(20.3%)	9(75%)	<0.0001
Asymmetry of sling arm	9(14.1%)	11(68.8%)	<0.001
Mesh position: Proximal Medium Distal	9 (14.3%) 51(81.0%) 3(4.8%)	2(13.3%) 8(53.3%) 5(33.3%)	0.004

Table 1 Post-operative ultrasound parameters evaluated in incontinent and continent women

Ultrasound parameters	Continent women			Incontinent women		
	Pre	Post	P value	Pre	Post	P value
Urethrocele at rest (UR)	-3.2±42.3	-14.6±9.5	0.036	-6.3±15.3	-12.7±11.8	0.23
Urethrocele during maximum Valsalva manoeuvre (UV)	-7.3±5.6	-9±5.1	0.045	-8.1±3.9	-10.8±6.8	0.26
UV-UR	10.3±11.5	6.7±10.5	0.046	8.4±6.6	5.0±15.3	0.43





Incontinent women had the sling in a more distal position compared to continent women (p=0.004); the prevalence of asymmetry of sling arms was higher in incontinent women compared to continent women (p<0.0001); incontinent women had higher prevalence of post-operative open bladder neck compared to continent patients (p<0.0001); women with open bladder neck had more distal slings compared to women with close bladder neck (36.4% vs 0%,p<0.0001).

Ultrasound Parameters	p value	OR	95% C.I.for OR	
			Lower	Upper
Post-operative open bladder neck	0.003	11.2	2.21	56.6
Asymmetry of sling arm	0.003	11.6	2.36	57
Mesh distal position	0.042	3.7	1.04	13.1

Table 2 Odds ratios for Incontinence versus Continence after TOT obtained in three separate multivariate logistic regression models

Continent women had an improvement of urethrocele grade at rest (p=0.036) and during Valsalva (p=0.045), and lower movement of urethra from rest to during Valsava (p=0.046). Incontinent women had higher prevalence of intrinsic sphincter deficiency (ISD) in preoperative urodynamic testing compared to continent patients (31.3%vs 0, p<0.0001). In a multivariate logistic regression women with asymmetric sling arms and open bladder neck had 11 increased odds of incontinence after TOT, such as the distal position of tape (OR:3.7 ;CI:1.04-13.1)

Conclusion

Ultrasonography is a non invasive method that provides exact information about the position and functional behaviour of the TOT sling at rest and during straining.A correct TOT positioning along the urethra seems to play a role in the incontinence outcome, so the correct surgical technique is mandatory to obtain the best results