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Abstract Reproduction Form B-1

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Title (type in CAPITAL LETTERS): TRANSVAGINAL ULTRASONOGRAPHY FOR EVALUATION OF URETHRAL SPHINCTER IN WOMEN

Aims of Study

Loss of urethral support or urethral hypermobility has been considered to cause incontinence in female and investigated with imaging techniques. Weakness of urethral sphincter muscle is also regarded as a principle etiology of incontinence; however little information on imaging of sphincter muscle in situ has been obtained. We have applied transvaginal ultrasonography (TVUS) to examine the sphincter muscle in continent and incontinent women. The aims of this video are to show ultrasonographic imagings of the female urethra, including sphincter and adjacent tissue, and to highlight TVUS as a useful method in incontinence assessment.

Methods

TVUS was performed with a 7.5 MHz transrectal biplane probe (No 8557, Bruel & Kaar, Denmark) with the patient spine. After observing the whole length of urethra, thickness of sphincter muscle in the anterior wall was measured at the mid-urethra. Three ultrasonographic parameters were defined: zone A, zone B and zone C, which represent circular layer of smooth muscle, striated muscle layer of rhabdosphincter and smooth muscle layer of pubovesical muscle, respectively. These 3 zones were identified as; zone B showed high echogenicity, while zones A and C remained low echogenic. The correspondence between ultrasonographic images and histological features was confirmed in cadaveric specimen.

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The patient also underwent conventional clinical studies including questionnaire, physical examination, pad test and cystography. Urodynamic evaluation consisted of urethral pressure profilometry, water cystometry and Valsalva leak point pressure measurement. Based on these studies, incontinent women was divided into hypermobility group, intrinsic sphincter deficiency (ISD) group and urge incontinence group.

Results

Forty-four incontinent and 17 continent women as control were evaluable. The thickness of zone A or zone B was significantly smaller in stress incontinence group, than control or urge incontinence group ($P<0.05$). In ISD group, the reduction thickness of zone A or zone B was correlated with incontinence severity in terms of symptom, pad test and leak point pressure. Urge incontinence group demonstrated no significant difference in zone thickness from control group.

Discussion and Conclusion

With advent of TVUS the thickness of urethral sphincter can be measured. The thickness was reduced in stress incontinent women compared with urge incontinent or continent women. Breaking down stress incontinent women into ISD group and hypermobility group, in the former the thickness reduction was more prominent and negatively correlated with symptomatic and /or urodynamic severity. These observations suggested TVUS would be a useful clinical examination to evaluate morphology and function of urethral sphincter muscle in incontinent women.