

Ultrasound measurement of vaginal wall thickness is a novel and reliable technique

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Objective: To assess whether ultrasound measurement of vaginal wall thickness demonstrates intra-observer and inter-observer reliability.

Method: Twenty five women had a transvaginal ultrasound scan and measurement of the thickness of tissue between the ultrasound probe and the pelvic organ in relation to the vaginal compartment being assessed. On the anterior vaginal wall this was the bladder and on the posterior vaginal wall, the rectum. This distance was termed vaginal wall thickness (VWT) and represented the thickness of the vaginal wall as well as any fascia between the vaginal wall and the pelvic organ. Measurements were taken at three anatomical sites: the bladder neck, dome of the bladder and the anterior fornix on the anterior wall, and the anorectal junction, rectum and posterior fornix on the posterior wall. The scan was repeated by an independent second operator at the first visit. Women then returned 4 to 6 weeks later and the ultrasound measurements of VWT were repeated. The interobserver and intraobserver measurements were analysed at each of the anatomical sites.

Results: The mean difference in measurements between the two observers for the bladder neck measurement was 0.3 (SD: 0.41), bladder dome 0.07 (SD: 0.5) and anterior fornix was 0.3 (SD: 0.3). The mean difference at the anorectal junction was -0.02 (SD: 0.4), rectum -0.02 (SD: 0.4) and posterior fornix 0.2 (SD: 0.2).

When comparing interoperator difference between visits 1 and 2. Mean difference for the bladder neck measurement was -0.1 (SD: 0.4), bladder -0.1 (SD: 0.3) and anterior fornix 0.07 (SD: 0.3). The anorectal junction was -1.0 (SD: 0.3), rectum -0.14 (SD: 0.4) and posterior fornix -0.05 (SD: 0.4).

Conclusions: VWT showed small differences between operators and between the same operators at different visits. It is therefore a reliable technique.

Table showing the mean inter- and intra-operator differences in VWT

	Mean difference bladder neck (mm) (95% CI)	Mean difference bladder dome (mm) (95% CI)	Mean difference anterior fornix (mm) (95% CI)	Mean difference anorectal junction (mm) (95% CI)	Mean difference rectum (mm) (95% CI)	Mean difference posterior fornix (mm) (95% CI)
Interoperator	0.3 (-0.14-0.20)	0.07 (-0.12-0.26)	0.3 (0.14-0.37)	-0.02 (-0.18-0.14)	-0.02 (-0.19-0.16)	0.2 (0.1-0.3)
Intraoperator (test retest)	-0.1 (-0.3-0.03)	-0.1 (-0.26-0.01)	-0.07 (-0.19-0.06)	-0.1 (-0.23-0.05)	-0.1 (-0.31-0.03)	-0.05 (-0.21-0.11)