Video Article

Transvaginal ultrasound evaluation of the ureter

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ABSTRACT

Objective

In this video, we present our technique for ureter assessment during pelvic ultrasound examination.

Methods

We used a GE Voluson E10 to perform transvaginal ultrasonography. These images were shared after thorough counselling, and obtaining informed consent from the patient. This video was edited using FinalCut ProX®.

Results

We systematized this routine after assessing the cervix, uterus, and adnexa. The vaginal probe was slightly removed to focus on the urethra. Next, we approached the hand on the contralateral thigh to the ureter. At this point, the probe was directed to the lateral pelvic wall where the ureteric orifice was found. Then, we raised our hands and perform an internal rotation movement to ascend the ureteral segments until it is related to the iliac vessels.

Conclusion

The urinary tract may be involved in gynecological pathologies. Transvaginal ultrasound is an easy, reproducible, and well-tolerated examination that can be used to evaluate the ureters below the pelvic brim.

Keywords: Transvaginal sonography; Ureter; Pelvic ultrasound; Urogynecology; Endometriosis
Transvaginal ultrasound has become the first choice for the evaluation of pelvic organs in gynecological consultations. The uterus, tubes, and ovaries were the focus of our attention. However, we are finding more uses for pelvic ultrasound, such as the functional assessment of the pelvic floor, urinary incontinence, the study of masses in the retroperitoneum, and the evaluation of the urinary tract.

The ureters are tubular structures, with the length of 25 cm long and 1-3 cm that run through the pelvis. They are related to the ovaries, uterine vessels, and great vessels, and among others [1]. Their complex anatomy makes transvaginal assessment difficult, and in addition to a theoretical basis, a learning curve is necessary to evaluate them. Pathologies such as megaureters, urinary tract calculi, ureteroceles, and endometriotic lesions are easily visualized and diagnosed during pelvic ultrasound examinations [2]. In this video, we present the systematic approach used in our hospital for their assessment.

The images shown are from a patient with deep endometriosis who visited the office for a 6-month check-up. The patient consented to the dissemination and publication of the ultrasound images. In addition, we used a simulation mannequin to show the movements made with the probe. The ultrasound machine used was a Voluson E10 from General Electric (CITY, STATE, COUNTRY), and the program used to edit the video.

This video shows the step-by-step procedure followed for the evaluation of the ureters. It is always performed after the ultrasound of cervix, uterus, and adnexa. With the probe placed in the vaginal fornix, we must withdraw it and focus on the urethra. Next, we moved the hand towards the thigh contralateral to the ureter that we wanted to study. The cut we used was parasagittal, so the uterus should not be seen. In addition, the images of the two ureters have the same composition. At this point, the probe was directed towards the pelvic wall. The screen shows the ureteral orifice and intravesical portion of the ureter. We can verify that the structure we are focusing on is the ureter if peristalsis is observed and if we see the ureteral jet with color Doppler is observed. To scale the ureter's path towards the pelvic brim, we slightly elevated the probe, making an internal rotation movement. We
found the junction with the uterine artery, the relationship of the ureter with the posterior pole of the ovary, and the cranial relationship to the great vessels.

The urinary tract is involved in gynecological pathologies. Transvaginal ultrasound is an easy, reproducible, and well-tolerated examination that can be used to evaluate the ureters of most women below the pelvic rim.

**Conflict of interest**

No potential conflict of interest relevant to this article was reported.

**Ethical approval**

This study did not require approval from the institutional review board because no patient data were included.

**Patient consent**

Written informed consent was obtained from the patient for publication of the images.

**Funding information**

None.

**Video clip**

Video can be found with this article online at https://doi.org/10.5468/ogs.21194.
References
