Video Article
Obstet Gynecol Sci 2022;65(4):382-383
https://doi.org/10.5468/ogs.21194
eISSN 2287-8580

Obstetrics & Gynecology Science

Transvaginal ultrasound evaluation of the ureter

Juan Ramón Pérez Vidal, MD, Carmen Llanos Llanos, MD, Inmaculada Gómez Carrascosa, MD, María Orenes Moreno, MD, Pilar Marín Sánchez, MD, PhD

Department of Gynecology, University Hospital Virgen de la Arrixaca, Murcia, Spain

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

Methods
We used a general electric Voluson E10 (General electric, Wauwatosa, WI, USA) 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® (Apple Inc, Cupertino, CA, USA).

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: Medical sonography; Ureter; Ultrasound; Ureteral disease; 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, andamong 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 [2,3]. 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 (Murcia, Spain), 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

Received: 2021.06.17. Revised: 2022.02.20. Accepted: 2022.03.31.
Corresponding author: Juan Ramón Pérez Vidal, MD
Department of Gynecology, University Hospital Virgen de la Arrixaca, 23, Calle Pintor Pedro Flores, 1b., Murcia 30011, Spain
E-mail: perezvidal.jr@gmail.com
https://orcid.org/0000-0001-8564-3483

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

1. Pateman K, Mavrelos D, Hoo WL, Holland T, Naftalin J, Jurkovic D. Visualization of ureters on standard gynecological transvaginal scan: a feasibility study. Ultrasound Obstet Gynecol 2013;41:696-701.
2. Bean E, Naftalin J, Jurkovic D. How to assess the ureters during pelvic ultrasound. Ultrasound Obstet Gynecol 2019;53:729-33.
3. Günakan E, Tohma YA, Tunç M, Akıllı H, Şahin H, Ayhan A. Factors associated with surgical morbidity of primary debulking in epithelial ovarian cancer. Obstet Gynecol Sci 2020;63:64-71.