ORIGINAL RESEARCH

Use of Transperineal Sonography to Diagnose Vaginal Abnormalities

Yan Wang, PhD [a,], Zan Sun, PhD [b], Na Li, MD [a], Xin Liao, MD [a], Xiaolu Liang, MD [a]*

[a]Department of Ultrasound, Shenyang Children's Hospital, Shenyang, China; [b]Laboratory Medicine, The people's Hospital of Liaoning Province and The People's Hospital of China Medical University, Shenyang, China.

Received December 21, 2017; revision requested February 22, 2018; revision received May 4; accepted May 7.

Objective: Vagina illness is common in young girls recently. Transperineal ultrasonography is not commonly used in evaluation of vagina illness. Here we report the use of the mechanical properties of color Doppler ultrasonography to further characterize vagina illness.

Methods: Eighty patients who came to Shenyang Children Hospital with vaginal discharge, vaginal bleeding, vulva redness and swelling were evaluated with transperineal ultrasonography and four typically cases were chosed which had tumor, vagina foreign body, vaginitis and imperforate hymen. Color Doppler ultrasonography was applied to these abnormities.

Results: When transperineal ultrasonography was applied to these abnormities, the tumor had the sign of occupying lesion and sparse color flow. Vagina foreign body showed high-echo strip object or moniliform in vagina accompany with vaginal dropsy. A 15-ays neonate girl with hydrocolpocele was diagnosed imperforate hymen later.

Conclusion: Transperineal ultrasonography can be used to enhance the diagnosis of vagina illness in young girls.

Key Words: Perineum; Ultrasonography; Girls; Vagina; Abnormality

Advanced Ultrasound in Diagnosis and Therapy 2018;02:119–22 DOI: 10.37015/AUDT.2018.180809

The vagina is located in the pelvic region and obtaining a good transabdominal songraphic image of this area can be difficult due to bowel gas and content [1], especially in young and infant girls. Due to the development of ultrasonographic equipment and new technology, transperineal sonography could be helpful for observing the vaginal structure and for diagnosing abnormalities [2,3]. Thus, this technology could address the weaknesses of endoscopic and X-ray imaging.

In contrast, vaginal tumors are rare and consistently associated with vaginal discharge and bleeding during the early stage. Endodermal sinus tumors in the vagina and rhabdomyosarcoma are common pathological patterns in children under 3 years of age.

Although occasionally observed on ultrasonographic images, most vaginal foreign bodies are initially diagnosed as kysthitis. The sonographic accuracy rate is 100% only for foreign bodies greater than 5 mm [4]. Foreign bodies are typically asymptomatic because most patients do not wish to report symptoms; however, if pain, swelling, discomfort, or recurrent vaginal secretions, especially purulent secretion, are present, a vaginal foreign body should be considered.

Transperineal sonography is highly sensitive for diagnosing vaginal tumors and vaginal foreign bodies. The primary role of a transperineal sonographic evaluation is to clearly visualize a tumor and differentiate

** Corresponding author: Department of Ultrasound, Shenyang Children's Hospital, No. 74, Chongshan Eastern Road, Huanggu District, Shenyang 110032, China.*
e-mail: wangyan_1229@163.com

it from a vaginal foreign body in young girls.

Although deciding whether purulent secretion results from pure kysthitis or a vaginal foreign body lacks clinical importance, this differentiation is occasionally difficult to achieve with sonography when the size of the foreign body is less than 5 mm [4]. However, if hyper echoic masses are present within the vagina, a vaginal foreign body should be suspected.

Transperineal sonography can be used for vaginal assessment in women with uterine malformations [5]. An imperforate hymen is typically diagnosed after puberty due to menstrual blood retention in the vagina. This condition is difficult to diagnose in toddlers. Transperineal sonographic imaging could offer a valuable method to diagnose hydrocolpocele.

We suggest that transperineal sonography is an accurate method for diagnosing vaginal abnormalities in young girls. The technique may also be of value in the assessment of other transperineal conditions. We aimed to present this finding given its uniqueness.

Patients and methods

Four patients (patients A, B, C, and D) were chosen for evaluation of recurrent vaginal secretions. Patient A was a 1-year-old girl with painless vaginal bleeding and vulval redness for several weeks. Patient B was a 6-year-old girl who had experienced vaginal purulent secretions for 6 months. Patient C was a 7-year-old girl who had experienced vaginal secretions and vulval redness for 10 months. Patient D was a 15-day-old female neonate with protruding orificium vaginae. Based on a physical examination, the cause of this condition was thought to be a vaginal abnormality.

Transperineal sonography was performed on each patient. In each case, vulval redness and swelling as well as different internal echoic patterns were observed. As routine check at our institution, color Doppler sonography was performed. Color Doppler ultrasonic equipment with a 10 MHz probe frequency from the Hitachi and Atoka Company of Japan was used. All patients were transperineally scanned using an ultrasound device with 10 MHz transducers. Importantly, these patients underwent surgery or other treatments. Informed consents were obtained from all participants, and the study received approval from the ethics committee of our hospital.

Results

Transperineal sonography revealed a vaginal tumor in patient A (Fig. 1). The internal echo pattern demonstrated a homogeneous hypoechoic mass in the vagina. When color Doppler sonography was applied, the internal echoes exhibited a sparse blood flow signal. An endodermal sinus tumor of the vagina was subsequently confirmed by surgery.

Similar to the previous case, a pathological diagnosis of an endodermal sinus tumor was established (Fig. 2). The microscopic image was presented at 400-fold magnification.

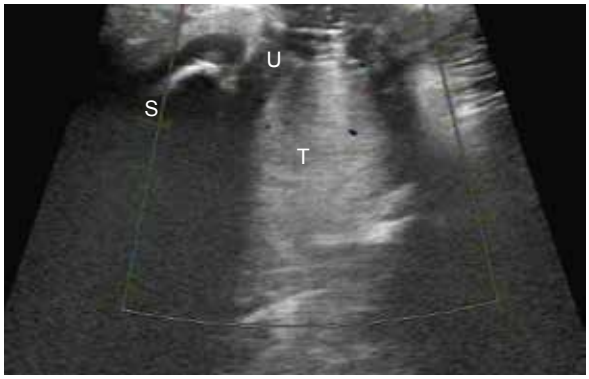

Figure 1 Transperineal sonography revealed a vaginal tumor in a one-year-old girl. The blood flow was sparse. U, urethra; S, symphysis publis; T, tumor.

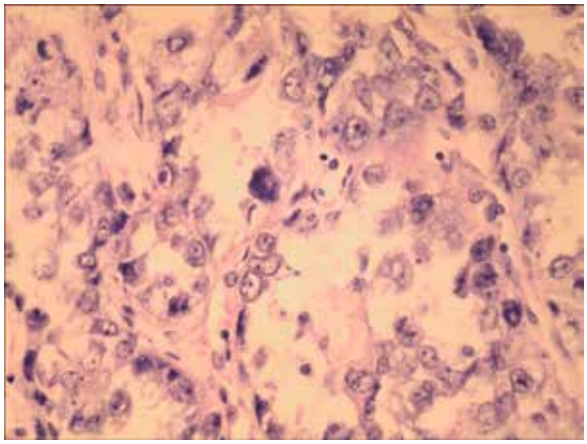

Figure 2 In the same case, the pathological diagnosis revealed an endodermal sinus tumor. This microscopic image is presented at 400× magnification.

Transperineal sonography revealed an echoless hyperechoic mass in the vagina (Fig. 3). The foreign body was removed by hysteroscopy.

Transperineal sonography revealed irregular thickening of the vaginal wall with a rich blood flow signal (Fig. 4). Precocious puberty was subsequently confirmed in the 7-year-old patient.

Transperineal sonography revealed hydrocolpocele in a 15-day-old female neonate (Fig. 5). The lack of an outward orificium vaginae combined with hydrocolpocele resulted in the diagnosis of an imperforate hymen by a pediatric gynecologist.

Figure 3 Transperineal sonographic image of a 9 × 4 mm foreign body in the vagina of a 6-year-old girl. Ultrasonic examination revealed a thickening of the vaginal wall and a small amount of anechoic liquid. F, foreign body.

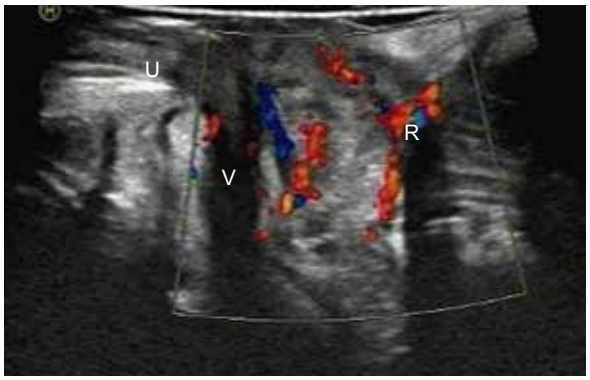

Figure 4 The transperineal image illustrateed irregular thickening of the vaginal wall in a 7-year-old girl. U, urehra; R, rectum; V, vaginal wall.

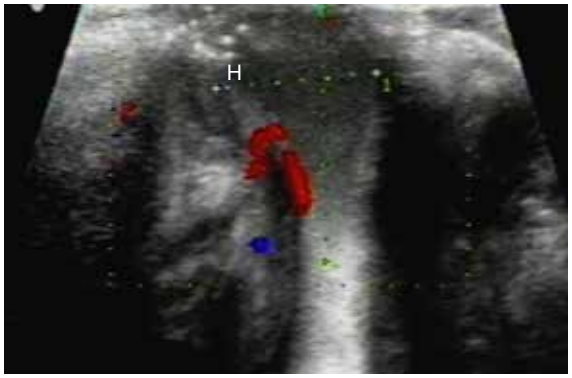

Figure 5 Hydrocolpocele was presented in a 15-day-old female neonate in this transperineal image. H, hydrocolpocele.

Discussion

The typical transperineal sonographic appearance of a vaginal tumor involved a homogenous hypoechoic mass that fills the vagina (Fig. 1). Classically, it is difficult to diagnose this condition through the abdomen, especially in young girls who often cry and move during the procedure. For transperineal sonography, it should be noted that internal echoes within the vagina may represent solid or solid-cystic lesions due to another process, such as necrosis or hematoma. Generally, the blood flow signal within the tumor is sparse. Hemorrhagic secretions and vaginal bleeding are typical clinical manifestations in young girls. The combination of patient history, a physical examination, and characteristic transperineal sonographic findings is typically sufficient to diagnose a vaginal tumor. The pathology of this case revealed an endodermal sinus tumor of the vagina (Fig. 2).

A vaginal foreign body is not rare. It is difficult to diagnose this condition using transabdominal sonography, whereas transperineal sonography is very helpful for the diagnosis [2]. The typical transperineal sonographic appearance was strip-hyperechoic and echoless in the vagina (Fig. 3). Some foreign bodies, such as a small stick, beads, toilet paper, and rubber, exhibit characteristic echo patterns. Although some small-sized foreign bodies are difficult to diagnose because the echo pattern is similar to that of an inflammatory exudate in the vaginal wall, if vulval redness, discomfort, or recurrent vaginal secretions, especially purulent secretions are present, a vaginal foreign body should be considered.

Here, we describe a case of a 7-year-old girl with repeated vaginal secretion for 10 months. Transperineal sonographic images revealed an irregular thickening of the vaginal wall with a rich blood flow signal (Fig. 4). Based on these results, as well as follicle-stimulating hormone and luteinizing hormone concentrations revealed by gonadotropin-releasing hormone testing, the size of the uterus, the volume of the ovaries, and magnetic resonance imaging of the hypophysis, she was diagnosed with peripheral precocious puberty.

The vaginal mucosa is thin in young girl due to low estrogen level. We observed vaginal mucosa thickness and multiple plicae in this patient; this finding was considered a sign of precocious puberty.

An imperforate hymen is generally diagnosed after puberty. Periodic abdominalgia is a common symptom caused by menstrual blood retention. This condition is asymptomatic during infancy. However, hydrocolpos is sometimes caused by maternal hormones during infancy. Transperineal sonography has unique advantages in detecting this condition (Fig. 5).

Vaginal illnesses are diverse and differentiating these conditions may be a significant issue. Additionally, transperineal sonography can be used to confirm vaginal tumors, foreign bodies, hydrocolpos, kysthitis, and cystocele [6].

Conclusion

Transperineal ultrasonography could be very helpful to enhance the diagnosis of vagina illness in young girls.

Conflicts of interest

We declare that we have no financial and personal relationships with other people or organizations that can inappropriately influence our work.

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