

## CASE REPORT

# A successful pediatric case of vaginal foreign body detection on transabdominal ultrasonography

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**Abstract**

Vaginal foreign bodies usually present with bleeding and foul-smelling discharge. It is often difficult to detect and identify vaginal foreign bodies in pediatric cases without any symptoms. Therefore, detection of vaginal foreign bodies using non-invasive methods, like transabdominal ultrasonography, is important in pediatric patients.

**KEYWORDS**

pediatric, point-of-care ultrasonography, vaginal foreign body

## 1 | INTRODUCTION

Vaginal foreign bodies (VFBs) are more commonly found in adult patients than in pediatric patients.<sup>1</sup> VFBs usually cause inflammation and present with bleeding and foul-smelling discharge.<sup>2</sup> These symptoms are responsible for approximately 4% of pediatric gynecologic outpatient visits under 13 years of age.<sup>1</sup> Pediatric patients cannot provide their caregivers or the medical staff with information regarding the object placed in the vagina. Additionally, many foreign bodies are not radiopaque.<sup>2,3</sup> Vaginal bleeding and vaginal discharge in pediatric patients may indicate the presence of VFBs.<sup>1</sup> In such cases, vaginal examination with vaginoscopy is performed. Direct visualization by vaginoscopy is reliable; however, invasive technique and procedural sedation or general anesthesia are necessary, especially in pediatric cases. Therefore, vaginal examination with vaginoscopy cannot be easily adopted. In clinical settings, identification of VFB without any symptoms is difficult if the object cannot be identified in an initial examination. One of the keys to diagnose VFB is the identification of the object using noninvasive techniques. In addition, we should

consider that the presence of a VFB may indicate sexual abuse.<sup>4</sup> This article reports a case of a VFB identified using transabdominal ultrasonography.

### 1.1 | Case Report

A 5-year-old girl was brought to our pediatric emergency department (PED) at midnight by her mother. She explained to her mother that she had placed a nut measuring approximately 1 cm in diameter in her vagina when preparing for a bath. She had picked up nuts around her house that evening. In the PED, she was afebrile with a heart rate of 91 beats per minute, a respiratory rate of 26 breaths per minute, and an oxygen saturation of 98% in room air. No vaginal pain, bleeding, or discharge was found, and the patient had no relevant medical history. Her height was 109 cm and weight was 17.7 kg.

Examination by frog-leg position revealed no suspected perineal injury due to sexual abuse. We inspected the interior of the vagina's entrance by gentle separation and traction of the labia, but we could not find the foreign body. VFB was strongly suspected but could not be found,

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so we tried to detect the foreign body using a diagnostic imaging approach. We chose ultrasonography because the nut is not radiopaque.

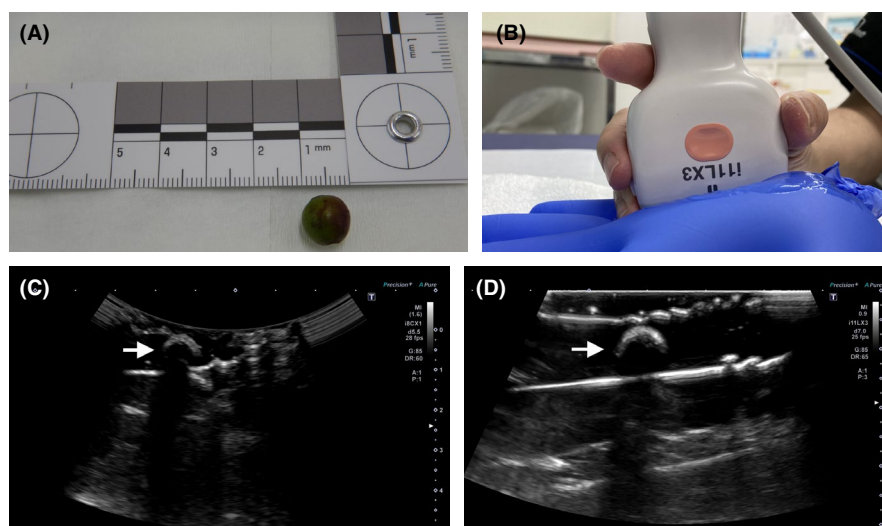
As a preliminary step, we scanned the same nut through the glove filled with water by ultrasonography and obtained an image of the view of the nut (Figure 1). After we obtained the image by ultrasonography, the patient was placed in a supine position and transabdominal ultrasonographic examination was performed using a Canon Aplio i700 machine (Canon Medical Systems Corporation; Tochigi, Japan). Ultra-wideband high-frequency convex transducer (1.8–6.2 MHz) and vascular linear transducer (3.5–8.5 MHz) were placed over the bladder in both longitudinal and transverse orientations (Figure 2) (Videos S2-A, S2-B, S2-C).

A foreign body, which had a round and hyperechoic structure with acoustic shadow, was detected in the distal part of the vagina, adjacent to the uterine cervix. We explained the presence of the VFB to the patient and her mother and sought informed consent and assent for inspecting the interior of the vagina using a vaginal speculum under sedation, and then obtained their permission to remove the VFB. Under procedural sedation, the gynecologist inspected the interior of the vagina using a vaginal speculum and removed the nut. No injuries were inflicted onto the vaginal wall and hymen, and a vaginal swab culture revealed normal microbial flora. In discussion with the patient alone, she denied any abuse. The following day, our child protection team interviewed the patient alone and concluded no possible sexual abuse.

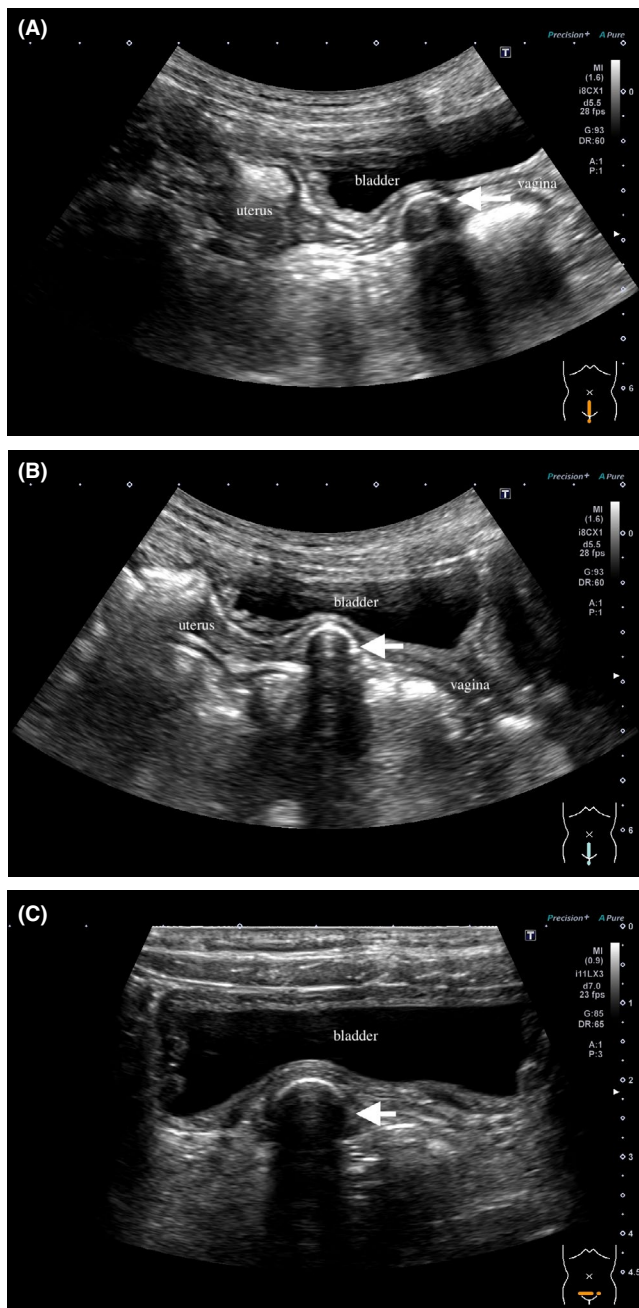
## 2 | DISCUSSION

We reported a case of VFB without any symptoms in a 5-year-old girl. In pediatrics, the detection of VFB is challenging without inspecting the interior of the vagina under sedation; however, we could identify VFB using transabdominal ultrasonography with a preliminary step.

Aspiration of foreign bodies is a common cause for visiting the emergency department among young children.<sup>5</sup> While foreign body in the airway is a leading cause of morbidity and mortality, foreign bodies in other orifices, such as the ear, nose, and vagina, are leading causes of infection and abrasion.<sup>2,3,5</sup> VFB in pediatric patients usually presents with bleeding and foul-smelling discharge because the patients might insert a foreign body and not inform their parents, leading to retention of VFB for a long term. The most common object is retained toilet paper.<sup>2</sup> Physicians should consider and examine vaginal discharge or bleeding as the main clinical sign of VFB. On the contrary, the diagnosis of VFB, which is not associated with vaginal discharge or bleeding or other symptoms, may be challenging in case of pediatric patients because they do not or cannot reveal the exact events, and many foreign bodies are not visible on radiography. In addition, the exploration of the vagina using a vaginal speculum is an invasive procedure and requires sedation. In this case, we could not find the VFB in the initial examination, and the gynecologist could not find the VFB without using a vaginal speculum. Gynecologists proposed observation because a full examination of the vagina requires anesthesia, so we debated the most suitable means of detecting



**FIGURE 1** View of the foreign body. (A) The nut has a diameter of approximately 1 cm and has a round shape (B) The preliminary ultrasonographic procedure. A transducer using ultrasonographic gel is placed on the glove filled with water over the nut (C) The view of the nut through an ultra-wideband high-frequency convex transducer. The white arrow indicates the nut. The nut is a round, hyperechoic mass with acoustic shadow (D) The view of the nut through a vascular linear transducer. The white arrow indicates the nut



**FIGURE 2** Ultrasonographic image. The cervix and vaginal canal exit to the right of the screen. The white arrow indicates the nut in each figure. The foreign body showed the same view as Figure 1 in the vagina. (A) Longitudinal view through a convex transducer (B) Transverse view through a convex transducer (C) Transverse view through a linear transducer

the foreign body and decided to use ultrasonography. Ultrasonography would be especially useful when a radio-lucent foreign body is suspected. Bedside ultrasonography, also known as point-of-care ultrasonography (POCUS), is a noninvasive procedure that is used to diagnose foreign bodies in the emergency department. POCUS is a less costly procedure and lacks ionizing radiations.<sup>6,7</sup> In contrast, we should recognize variants of pediatric anatomy,

common artifacts, mistakes, and pitfalls because ultrasonography is operator dependent.<sup>8</sup> POCUS techniques like focused assessment with sonography for trauma and extended focused assessment with sonography for trauma (eFAST) are used to evaluate trauma. POCUS is also used to evaluate dyspnea, abdominal pain, and musculoskeletal complaints in adult cases. VFB detection with POCUS is important when diagnostic imaging resources are limited, and the efficiency of POCUS for detecting VFBs has been reported.<sup>3,9,10</sup> POCUS of VFBs has two approaches, the transperineal and transabdominal approaches. We could not find the VFB in the interior of the vaginal entrance, so we chose the transabdominal approach. We easily recognized the nut in the vagina using ultrasonography by obtaining the view of the nut through transducers use beforehand.

Another problem of VFBs is identifying who inserted the foreign bodies. VFB is associated with sexual abuse, and physicians need to consider prepubertal girls with VFB as possible victims of sexual abuse and guarantee the safety of the child.<sup>4,11</sup> When examining VFBs, clinicians must ask whether the patient or someone else inserted the object in the vagina because pediatric patients may not tell the truth about their situations to their families. In addition, clinicians must inspect the vaginal wall and hymen for injury during the removal of the foreign body as well as examine other signs of physical abuse.

### 3 | CONCLUSION

An ultrasound examination may sometimes be useful in detecting the presence of VFBs. Pediatric patients with VFBs may not tell the truth about who inserted the object in their vaginas. Therefore, the possibility of sexual abuse must always be considered in cases of VFBs.

### ACKNOWLEDGMENTS

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### CONFLICTS OF INTERESTS

None declared.

### AUTHOR CONTRIBUTIONS

KN drafted the manuscript and revised it as the first author. SH and YO critically reviewed and revised the manuscript. All authors have read and approved the final version of the manuscript.

### ETHICS APPROVAL

Ethics approval was not mandatory for publication of case reports as per the institutional policy.

## CONSENT

Written informed consent was obtained from the patient's parent to publish this report in accordance with the journal's patient consent policy.

## PERMISSION TO REPRODUCE MATERIAL FROM OTHER SOURCES

Not applicable.

## CLINICAL TRIAL REGISTRATION

Not applicable.

## DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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