

## Transabdominal ultrasound aids in the diagnosis of hematocolpometra due to imperforate hymen in an 11-year-old female: a case report

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### Abstract

Imperforate hymen is a relatively rare congenital anomaly, but it is the most common anomaly of the female reproductive tract. Diagnosing imperforate hymen is relatively easy for obstetricians and gynecologists. However, patients with imperforate hymen often visit primary physicians, emergency physicians, or pediatricians due to abdominal pain, urinary distention, or lower back pain, and it is difficult to diagnose imperforate hymen using only a description of the symptoms and palpation. The present case report details the transabdominal ultrasonographic diagnosis of imperforate hymen in an 11-year-old female with a 15-day history of increasing abdominal pain, lower back pain, and slight pain during urination. The three transabdominal ultrasound findings essential for the accurate diagnosis of imperforate hymen were: vaginal dilation, anterosuperior location of the uterus, and a fluid connection sign between the vagina and the uterus. We propose that primary physicians can easily visualize the uterus during abdominal ultrasonography by ensuring that the bladder is full, using graded compression, and observing a fixed position. Primary physicians can achieve an early diagnosis of vaginal closure by confirming the presence of the three abdominal ultrasonographic findings, in combination with history taking and palpation.

### Keywords

transabdominal ultrasonography, imperforate hymen, hematocolpometra, adolescent, primary care

### 1. Introduction

Imperforate hymen is a relatively rare congenital anomaly, with a reported incidence of approximately 1 : 2,000<sup>1)</sup>. Furthermore, this anomaly may not be detected until the onset of menses, and the mean patient age at the time of diagnosis is 13.1 years<sup>2)</sup>. Imperforate hymen is often diagnosed via ultrasound and MRI examinations. Failure of partial resorption of the membrane during embryonic development causes the accumulation of menstrual blood in the vagina, referred to as hydrometrocolpos. Herein, we present a case of imperforate hymen that was successfully diagnosed with the help of transabdominal ultrasonography.

### 2. Case presentation

An 11-year-old female presented with a 15-day history of increasing abdominal pain, lower back pain, and slight pain during urination. The patient's vital signs were normal. There was no history of severe abdominal pain, fever, joint pain, rash, or neurologic symptoms. There were no signs of defecation problems. The patient had not engaged in physical activity before the onset of pain. She had not undergone menarche. Physical examination

revealed a palpable, tender, nonpulsatile midline small mass extending from the midline of the pelvis to the umbilicus. There were no abnormal urinalysis findings.

A skilled sonographer with more than 10 years of experience in abdominal ultrasonography performed transabdominal sonography using an ultrasound system with 5-MHz curved array transducers (LOGIQ P6; General Electric Ultrasound, Tokyo, Japan). Abdominal ultrasonography showed a well-defined mass in the pelvic midline on the dorsal side of the bladder (**Fig. 1 a**). The size of the mass was 15 cm × 6 cm × 6 cm. Color Doppler demonstrated no obvious blood flow signals (**Fig. 1 b**). Vaginal dilation was suspected as the mass was between the bladder and the rectum, and the uterus was located on the cranial side of the mass. The uterus was normal in size, but was pushed to an anterosuperior position (**Fig. 1 c**), and the endometrial cavity contained fluid with echogenic debris, suggestive of clotted blood. In addition, there was a connection between the tubular vaginal lesion and the uterus (**Fig. 1 d**). These findings indicated hematocolpometra.

Gynecologic examination revealed that the patient had imperforate hymen. Laboratory tests showed

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Received on August 30, 2018; Revision accepted on October 30, 2018 J-STAGE. Advanced published. date: December 6, 2018