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Case Report

Imperforate hymen causing hematocolpos, hematometra and acute urinary retention in an adolescent girl [☆]

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ABSTRACT

Abdominal pain is a common occurrence in the adolescent demographic, encompassing a wide range of differential diagnoses. The etiology of abdominal pain can be categorized into gastrointestinal, urologic, and gynecologic causes. In the female pediatric population, acute urinary retention is an uncommon but noteworthy source of abdominal pain, typically resulting from an obstructive process. Hence, it is imperative to perform a comprehensive physical examination prior to deciding on the management approach. We present the case of a 11-year-old girl who visited the emergency department due to suprapubic discomfort and acute urinary retention. The patient had no significant medical or surgical history, and her neurological examinations were normal. Urinary catheterization drained 500 mL of urine. Abdominal ultrasonography revealed a hematocolpos compressing the urinary bladder. Further gynecologic history indicated that the patient had not yet experienced menarche. Consequently, a cruciate incision was performed, which resolved her urinary retention.

This article aims to emphasize that although rare, imperforate hymen should be considered as a potential cause of acute urinary retention during adolescence. If an adolescent presents with abdominal pain and voiding difficulties, it is crucial to obtain a detailed gynecological history and conduct a thorough physical examination of the genital introitus.

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Introduction

Imperforate hymen represents the most prevalent obstructive anomaly affecting the female genital tract, attributed to

incomplete canalization of the vaginal plate during fetal development [1,2]. Its incidence ranges from 1 in 1000 to 10,000 girls, with approximately half experiencing urinary retention [3]. While typically sporadic, familial cases have also been documented [4]. Diagnosis may occur incidentally during physi-

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cal examination or following evaluations for primary amenorrhea, lower abdominal pain, or, less frequently, urinary retention [1]. Here, we present the case of a 11-year-old girl who presented to the emergency department with sudden onset acute urinary retention. Abdominal ultrasonography revealed hematocolpos, prompting the diagnosis of imperforate hymen. We aim to emphasize that although rare, imperforate hymen should be considered as a potential cause of acute urinary retention during adolescence. If an adolescent presents with abdominal pain and voiding difficulties, it is crucial to obtain a detailed gynecological history and conduct a thorough physical examination of the genital introitus.

Case report

A 11-year-old girl with fully developed characteristics of gender but no menarche. She presented to the emergency department due to sudden onset of acute urinary retention, and lower abdominal pain. She had no history of gastrointestinal issues, and described her abdominal pain as cramping. The patient's family reported that there was no significant medical or surgical history and that she had never menstruated.

During physical examination conducted by a pediatric resident, mild tenderness was noted in the suprapubic region, while her neurological examination showed no abnormalities. Initial laboratory tests upon admission revealed hemoglobin levels of 13.6 g/dL (normal value : 10-14 g/dL), hematocrit of 38.0% (37%-47%), a white blood cell count of 12,750/mm³ (normal value : 4000-10,000/ mm³), and a platelet count of 266,000/mm³(normal value : 150,000-40,000/ mm³). Liver function tests and albumin levels were within normal limits, as were blood urea nitrogen (BUN) and creatinine levels. The patient was catheterized with a 14F Foley catheter and 400 mL of urine was drained. Urine analysis and cultivation were positive.

Transabdominal ultrasound revealed significant distention of the vagina with hyperechoic fluid collection compressing the urinary bladder (Fig. 1), indicating hematocolpos. An hematometra, and mobile bladder sediment was also noted. Given these findings on imaging, there was a high suspicion of imperforate hymen being present. Examination of the genital area confirmed the diagnosis of imperforate hymen, with no abnormal findings noted in other organs. The urinary sediment is explained by the urinary infection as proven by the ECBU which was positive

Based on the ultrasound findings, consultation with the gynecology department led to a hymenotomy performed via cruciate incision with drainage of the hematocolpos. The patient's postoperative course was uneventful, and she did not experience any further urinary symptoms.

Discussion

Hematocolpos refers to the retention of menstrual blood within the vagina. This condition typically arises at puberty during the initial menstruation, with an imperforate hymen

being the most common cause. Less frequently, it can be caused by a higher complete vaginal diaphragm or partial vaginal atresia [5]. Imperforate hymen occurs in approximately 0.1% of cases, and there are familial instances [6]. Puberty is the most common period for the discovery of hematocolpos. Normal development of secondary sexual characteristics accompanies primary amenorrhea.

The primary clinical signs are amenorrhea, cyclic lower or abdominal/pelvic pain, which can be associated with a hypogastric mass in cases of hematometra. The pain can sometimes mimics appendicitis [6]. Lower back pain, sciatica with sensory and motor deficits in the lower limb have also been reported [5]. Urinary symptoms due to compression may lead to acute retention [7–9], dysuria, and bilateral hydronephrosis [7]. In cases of imperforate hymen, the accumulation of menstrual blood in the vagina (hematocolpos) can exert pressure on the bladder and urethra, causing acute urinary retention [10].

The onset of symptoms often coincides with the first menstruation (menarche), triggering the accumulation of menstrual blood in the vagina and uterus. If untreated, vaginal distension can lead to urethral obstruction due to the close anatomical relationship between the vagina and the anterior vaginal wall. Although rare, imperforate hymen can also present during the neonatal period due to mucocolpos [9,11,12].

Diagnosing this condition clinically is relatively straightforward in an adolescent presenting with abdominal pain and urinary symptoms. Examination of the vulva reveals an obstruction of the vaginal opening by a thin, bulging membrane (hymen) in a patient who has not yet menstruated despite the development of secondary sexual characteristics [5,6]. However, clinical recognition of imperforate hymen is often overlooked due to inadequate gynecological history-taking and initial physical examinations conducted by the pediatric [1], as was the case with our patient, where the diagnosis was made only after an ultrasound was performed.

Suprapubic ultrasound shows a finely echogenic retrovesical image. This collection is topped by the communicating uterine cavity, which is often small and dilated with liquid content in cases of hematometra [13]. Hematosalpinx or peritoneal effusion may be detected [6]. Ultrasound also helps analyze uterine malformations. Renal agenesis is systematically checked for, especially in cases of genital duplication [5]. Ultrasound can also show ureteropelvic dilation if the urinary tract is compressed by hematocolpos [7]. MRI, like ultrasound, is safe for young girls and is considered the best complementary exploration technique, providing excellent anatomical morphological analysis of the malformation on T2-weighted sequences. T1-weighted sequences confirm the presence of blood in the vagina and the overlying uterine horn [7,14].

In practical theory, diagnosing imperforate hymen in an adolescent presenting with abdominal pain and urinary symptoms, along with absence of menarche and lack of visible hymenal introitus during physical examination, might seem straightforward. However, clinical recognition of imperforate hymen is often overlooked due to inadequate gynecological history-taking and initial physical examinations conducted by the treating physician [1]. Studies indicate that imperforate hymen frequently eludes diagnosis during initial medical

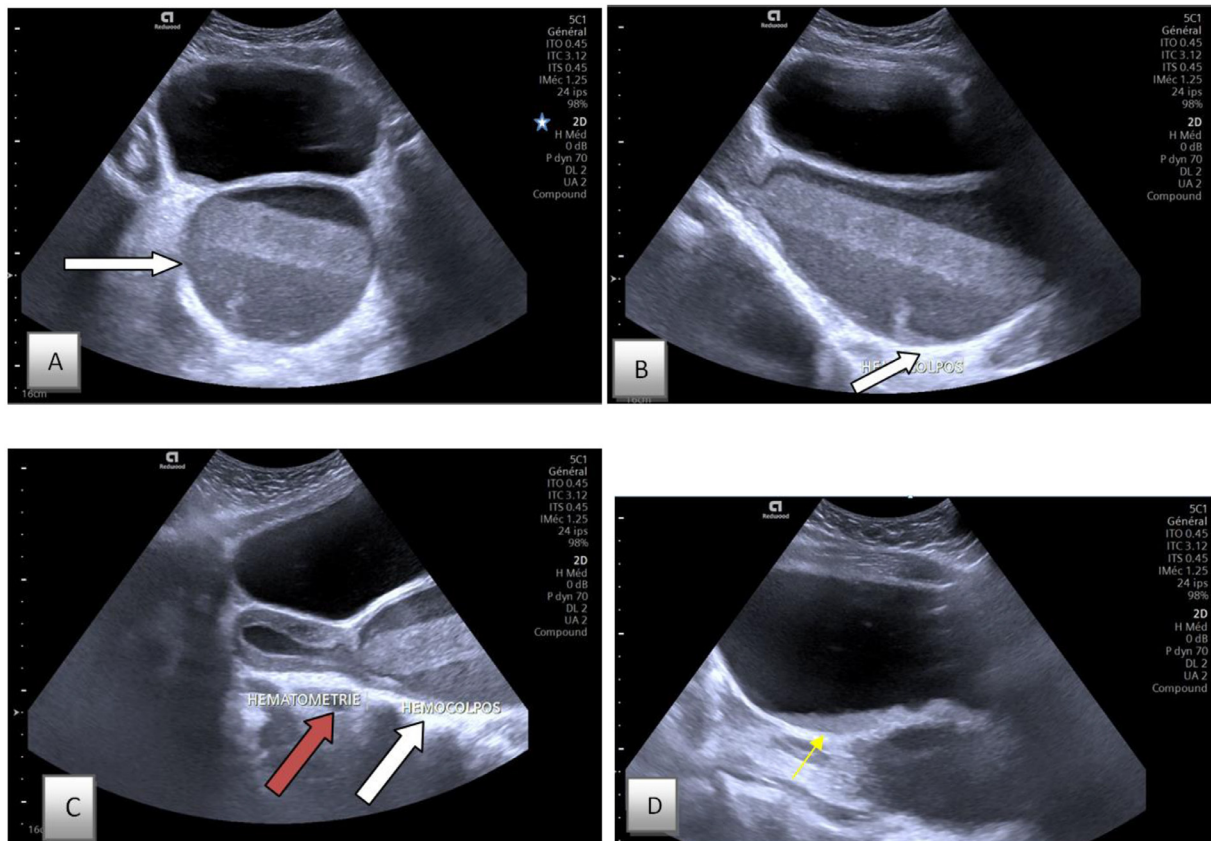


Fig. 1 – (A) Axial and sagittal pelvic ultrasound images showing the distention of the vagina with hyperechoic fluid collection (white arrow) compressing the urinary bladder anteriorly (asterisk). (C) Sagittal pelvic ultrasonography image showing communication between hematocolpos and cervix (red arrow). (D) mobile bladder sediment (yellow arrow).

consultations [12,13]. Similarly, in our case, the pediatric failed to conduct a thorough gynecological history, including menarche, thereby missing the diagnosis of imperforate hymen. Diagnosis was confirmed after abdominal ultrasound prompted further gynecological examination which confirmed the diagnosis.

The treatment of hematocolpos depends on its cause. In the case of an imperforate hymen, treatment involves a hymenotomy or hymenectomy to drain the hematocolpos [5,6].

This case highlights the recurrent neglect of thorough physical examinations in emergency settings and outpatient consultations, underscoring the critical need for improved medical education, particularly among pediatric residents, regarding the importance of comprehensive physical assessments, including meticulous examination of the hymen.

Conclusions

Imperforate hymen is a rare congenital anomaly that can often go undiagnosed yet poses a significant risk of acute urinary retention in adolescents. It is crucial for clinicians to be vigilant about considering imperforate hymen as a potential but noteworthy cause of acute urinary retention. When encountering an adolescent girl with symptoms such as ab-

dominal pain and voiding dysfunction, thorough gynecological history-taking and meticulous physical examinations of the genital introitus are essential. These steps are critical to ensure timely diagnosis and appropriate management of imperforate hymen, thus preventing potential complications associated with delayed recognition and treatment.

Author contributions

All authors contributed to this work. All authors have read and approved the final version of the manuscript.

Guarantor of submission

The corresponding author is the guarantor of submission.

Patient consent

Written informed consent for publication was obtained from patient.

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