



Clinical Communications: Pediatrics

IMPERFORATE HYMEN CAUSING HEMATOCOLPOS AND URINARY RETENTION

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Abstract—Background: Acute urinary retention is rare in the pediatric population and is typically caused by an obstructing entity. It may result from hematocolpos caused by imperforate hymen. Imperforate hymen is rare, with an associated incidence of 1 in 2000 people. Nonetheless, in a pediatric age female who presents with urinary retention and who has a history of primary amenorrhea or a history of cyclical pelvic pain an examination of the external genitalia should be performed to rule out this condition. **Case Report:** A 12-year-old girl presented to the emergency department with urinary retention and was discharged with a diagnosis of urinary tract infection. She returned the following day to the emergency department with worsening abdominal pain. A computed tomography scan revealed a fluid-filled vagina measuring 12.5 cm. Her bladder measured 15.4 cm. The patient was taken to the operating room for further evaluation by the consulting gynecologist. At the time of surgery, 1000 mL of urine were evacuated after catheterization. Three hundred milliliters of chocolate-colored fluid, consistent with menstrual blood, were evacuated at time of hymenotomy. Hymenotomy was performed with a cruciate incision. No complications were encountered. **Why Should an Emergency Physician Be Aware of This?:** To date, there have been >40 reported cases of imperforate hymen causing hematocolpos and subsequent urinary retention. However, given the rarity of imperforate hymen, hematocolpos leading to acute urinary retention can still be missed. Untreated urinary retention can lead to a compromise in bladder function and subsequent kidney damage. © 2019 Elsevier Inc. All rights reserved.

Keywords—abdominal pain; hematocolpos; imperforate hymen; urinary retention

INTRODUCTION

Abdominal pain is common in the adolescent population, and the differential diagnosis is wide. Causes of abdominal pain are gastrointestinal, urologic, and gynecologic in etiology. Acute urinary retention is a rare source of abdominal pain in the female pediatric population and is typically caused by an obstructing entity (1). It is therefore paramount that a thorough physical examination be performed before determining the course of management.

CASE REPORT

A 12-year-old girl presented to the emergency department with a 1-week history of worsening abdominal pain and an inability to urinate for 3 days. She was diagnosed with a urinary tract infection and discharged home with a course of antibiotics. She was further advised to take ibuprofen for pain management. The patient returned to the emergency department the following day reporting no pain relief after taking ibuprofen. Urinalysis was negative for leukocyte esterase and nitrites. White blood cells were not present in the urine.

The patient's family reported that there was no significant medical or surgical history and that she had never menstruated. Vital signs were within normal limits. An examination of the abdomen was significant for distention and marked diffuse tenderness on palpation. Neither rebound or guarding were present. The patient refused to be examined further. Multiple doses of narcotics had been

administered. Hemoglobin was 13.1 g/dL, and creatinine was 0.37 mg/dL. There were no other abnormal laboratory values.

Computed tomography (CT) was then performed and showed a distended fluid-filled vagina measuring 12.5 cm and a bladder measuring 15.4 cm. CT of the abdomen and pelvis is shown in [Figure 1](#). Mild bilateral hydronephrosis was also noted.

Transabdominal ultrasonography was also performed and showed a large cystic structure containing an echogenic fluid density in the midpelvis, likely representing hydrocolpos. Bladder distention was also noted. The transabdominal ultrasound is shown in [Figure 2](#). Given these findings on imaging, there was a high suspicion of imperforate hymen being present. After obtaining informed consent, the patient was transferred to the operating room for a pelvic examination under anesthesia and hymenectomy. One thousand milliliters of urine were evacuated after catheterization. Examination of external genitalia confirmed a bluish, bulging imperforate hymen. A cruciate incision was made at this site. Three hundred milliliters of thick chocolate-colored fluid, consistent with old menstrual blood, were evacuated. Marsupialization of the hymenal edges was then performed with 4-0 vicryl suture. The patient was then transferred to the recovery room in stable condition. She was able to urinate 4 h postoperatively and was then discharged to her home. Abdominal pain had resolved.

At a postoperative visit 2 weeks after surgery, the patient refused a pelvic examination. Four weeks after surgery, the patient reported having a period that lasted for 4 days. During her menses, the patient reported not hav-

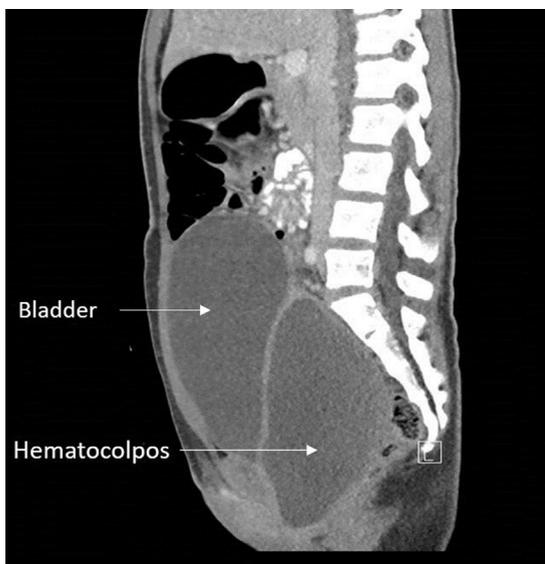


Figure 1. Computed tomography image of the abdomen and pelvis showing distended bladder and hematocolpos.

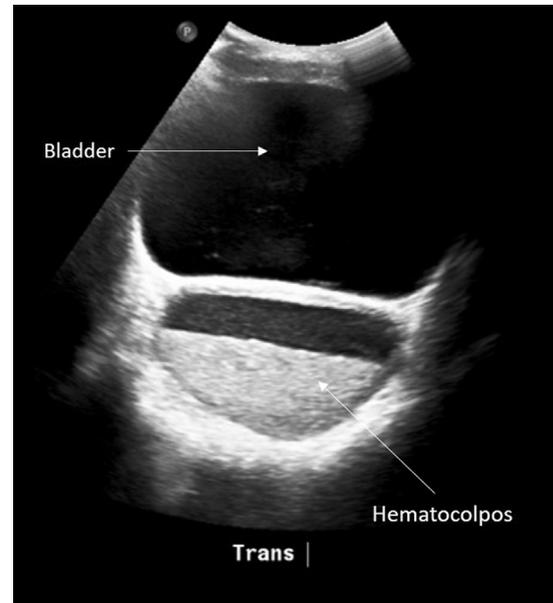


Figure 2. Transabdominal ultrasound image showing the distended bladder and hematocolpos.

ing to take medication for pain and that she used 3 to 4 pads per day that her menses lasted.

DISCUSSION

Causes of acute urinary retention are neurologic, inflammatory, pharmacologic, and anatomic in nature. Untreated urinary retention can lead to a compromise in bladder function and subsequent kidney damage (1).

Urinary retention is rare in women. If urinary retention were to occur, it would be caused by an obstructive source, such as ureteral stones, cystocele, uterine prolapse, or fibroids. These sources of obstruction are rare in the pediatric population (1). Asgari et al. evaluated causes of urinary retention in 58 girls ≤ 14 years of age (2). In this study, the most common causes of urinary retention in girls were ureterocele in 6 cases and trauma in 5 cases. In 3 cases, imperforate hymen leading to hematocolpos was the cause and was associated with primary amenorrhea and pelvic pain. Therefore, in the pediatric age female who presents with urinary retention and who has a history of primary amenorrhea or a history of cyclical pelvic pain, an examination of the external genitalia should be performed to rule out imperforate hymen.

The hymen is a remnant of mesoderm tissue that normally perforates during embryonic development. Imperforate hymen is therefore a rare congenital anomaly with an incidence of 1 in 2000 people (3). Presentation of this condition is variable. Prenatally, imperforate hymen may be associated with fetal ascites as detected on ultrasonography. In infancy, a bulging hymen may be

present because of the accumulation of secretions. However, the majority of those with an imperforate hymen are asymptomatic before menarche (4). The frequency of hematocolpos associated with imperforate hymen is 0.14% (5). Hematocolpos from an imperforate hymen, if left untreated, can cause distention of the vagina and lead to stretching and obstruction of the urethra because of its proximity to the anterior vaginal wall. This results in pressure on the posterior wall of the bladder.

In the published literature, 46–58% of cases of hematocolpos are associated with urinary retention. Symptoms that may be associated with urinary retention include dysuria and urinary frequency and urgency secondary to stasis of urine (6). Therefore, those with hematocolpos leading to urinary retention may be misdiagnosed as having a urinary tract infection, as in our patient. In addition, in the presence of severe abdominal pain that is not controlled with pain medication, imaging should be performed in the form of either a CT scan of the abdomen and pelvis or transabdominal ultrasonography. On CT and on ultrasonography, a mass with a fluid level that is posterior to the bladder and lies immediately inferior to the uterus is highly suggestive of hematocolpos (7).

An imperforate hymen can be easily detected on examination of the external genitalia. However, this is not a comfortable examination for a pediatric age girl to undergo, especially in the setting of severe abdominal pain. It is therefore recommended to obtain a consultation from a gynecologist who can then perform a pelvic examination under general anesthesia, catheterize the bladder, and perform a hymenotomy and evacuate the menstrual blood. At time of hymenectomy, it is generally advised to excise a portion of the hymen. In addition, recurrence of imperforate hymen can be significantly reduced by plicating the edges (8). Hymenectomy is a procedure that is associated with a low rate of complications. In regard to postoperative follow-up, examination of the external genitalia is important in assuring that the hymen continues to remain perforated. However, in cases in which an examination of the external genitalia is not feasible

because of preference of the patient or the patient's family, verbal feedback regarding menstruation pattern and nature of pain (if present) can be obtained approximately 1 month after the hymenectomy.

WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?

To date, there have been >40 reported cases of imperforate hymen causing hematocolpos and subsequent urinary retention. However, given the rarity of imperforate hymen, hematocolpos leading to acute urinary retention can still be missed. Obtaining a complete history and performing a thorough physical examination in the setting of acute urinary retention in a pediatric age female is essential. In addition, it is imperative that imaging be obtained in the setting of abdominal pain that is not responsive to pain medication. Prompt management of hematocolpos causing urinary retention can prevent serious complications, such as acute renal injury.

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