

## Hematocolpos: Rare but Commonly Missed Cause of Recurrent Pain Abdomen in Children – A Case Report and Review of Literature

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### ABSTRACT

Hematocolpos, a rare condition, occurs when menstrual blood or secretory fluid accumulates in the vagina due to vaginal obstruction. It is often caused by various congenital urogenital anomalies. Early diagnosis is crucial to prevent complications such as tubal adhesion, pelvic endometriosis, and infertility. Hematocolpos can present with recurrent abdominal pain in children, which is occasionally missed in the early period of hospital visits. A proper approach to a hematocolpos includes physical examination and imaging findings. Magnetic Resonance Imaging plays a crucial role in diagnosis and guidance for surgical interventions.

### Keywords

Abdominal pain; hematocolpos; magnetic resonance imaging

### INTRODUCTION

Acute onset of abdominal pain is one of the common symptoms encountered in childhood, which could be due to a wide range of underlying medical conditions that can be either surgical or non-surgical. Hematocolpos is most commonly caused by an imperforate hymen, which is not a common congenital abnormality in children; it usually develops during puberty.<sup>1</sup> The incidence is reported to be 0.1%.<sup>2-6</sup> It may present as an isolated finding, or it may be associated with other congenital defects. Clinical symptoms range from lower abdominal pain to urinary retention. Pain may be acute or episodic.<sup>2</sup> Magnetic Resonance Imaging (MRI) is the gold standard for the diagnosis of hematocolpos, which gives an idea about the location of the collection, the amount of collection, the level of obstruction, and finally, the age of the blood in the collection.

### CASE PRESENTATION

We present the case of a twelve-year-old girl who was brought to the emergency department (ED) with a complaint of abdominal pain

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for a two-day duration. Pain was acute on onset; pain started gradually and has increased in severity with no aggravating or relieving factors. Pain did not subside with a normal analgesic. There was no history of nausea, vomiting, altered bowel habits, constipation, or fever. She never had a menstrual period or any vaginal spotting. She was otherwise healthy and did not take any medications daily.

At the presentation, she was severely distressed due to pain. Her vitals were a pulse rate of 110 beats/min, blood pressure of 100/ 76 mm Hg, normal temperature of 98.6°F, respiratory rate of 17 breaths/min, and 97% of oxygen saturation on room air. Full body examination revealed normal secondary sexual characteristics. On abdominal palpation, there was tenderness mainly in the hypogastrium with a palpable mass. No introital bulge is noted in visual inspection. Laboratory tests revealed mild anemia with a negative pregnancy test. Hence, ultrasonography of the abdomen and pelvis was ordered.

### IMAGING EVALUATION

Transabdominal ultrasound (US) revealed a mass-like lesion in the pelvis; however, the lower extent of the lesion could not be identified. The uterus was poorly visualized as there was a compression due to an over-distended urinary bladder. Transabdominal ultrasound led to an uncertain diagnosis; hence, an MRI of the pelvis was planned.

On MRI imaging, there was a layered (high, intermediate, and low) signal intensity noted in T1/ T2 (Fig.1) within the endometrial cavity.

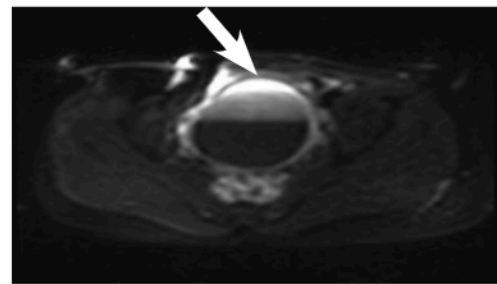


**Figure 1.** MRI T2 sagittal sequence in sagittal plane with layered signal intensity (white arrows) showing high signal intensity anteriorly, followed by intermediate signal in the middle, and low signal intensity posteriorly.

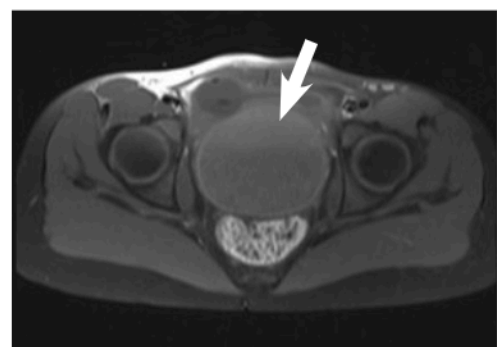
The body and cervix of the uterus were compressed (Fig. 2) and displaced superiorly and anteriorly. There is no fat suppression seen on STIR sequences.



**Figure 2.** T2WI Coronal MRI shows significantly distended vaginal canal (shown by white arrows) and compressed and displaced uterus superiorly and left lateral side of the abdomen (shown by blue arrows).



**Figure 3.** DWI sequence with restricted diffusion in the anterior portion of the collection (white arrow)



**Figure 4.** T1WI axial image shows high to intermediate signal intensity content within (white arrow).

On DWI (Fig. 3), no restricted diffusion was seen. There was lower signal intensity seen in the T1 sequence (Fig. 4), with patchy areas of high signal intensity indicating the ongoing blood product.

## DISCUSSION

Remnant of mesodermal tissue from embryonic development includes the hymen.<sup>7</sup> When it fails to perforate during this stage of development it causes accumulation of menstruation products in the vagina and uterus which leads to health concerns during puberty. An imperforate hymen is usually a congenital condition; there are some cases where it has been linked to sexual abuse.<sup>8</sup> It is estimated that imperforate hymen occurs in about 0.1% of children.<sup>4</sup> Although cases of this condition are sporadic, some familial occurrences have been documented in several studies. The inheritance pattern can be either autosomal recessive or dominant.<sup>2</sup> Imperforate hymen is an isolated condition, though it can be associated with genetic syndromes such as McKusick-Kaufman syndrome or Bardet-Biedl syndrome.<sup>9</sup> Other related anomalies could be polydactyly, congenital anorectal abnormalities, and multicystic dysplastic kidneys, with some cases also presenting with urinary tract problems. The clinical presentation of an imperforate hymen varies depending on the patient's age at which it was diagnosed. In some cases, reported previously, it is detected prenatally through ultrasound, showing signs and symptoms of bladder outlet obstruction due to conditions like hydrocolpos or mucocolpos. In newborns, it may be recognized by fetal ascites or acute renal failure.<sup>10</sup> The accumulation of menstrual fluid within the endometrial cavity and cervical canal in cases like imperforated hymen, where it exerts mass effect, resulting in complications such as obstructed urinary flow, hydroureter, hydronephrosis, and nephronia. In adolescents, common symptoms include cyclic lower abdominal pain, primary amenorrhea, chronic constipation, back pain, dysuria, and acute urinary retention (AUR).<sup>2</sup> AUR, seemingly uncommon in children, may progress due to various issues such as inflammation, medication side effects, or dysfunction between the bladder and sphincter.<sup>11</sup> Studies suggest the incidence of AUR in patients with imperforate hymen ranges from 3% to 46%.<sup>7</sup> The underlying mechanisms may involve the retained hematoma, which is compressing on the urethra or affecting its innervation, which is the sacral plexus, and the mechanical effect of the hematoma could change the bladder neck and urethra angle, leading to urinary obstruction.<sup>12</sup> The management of urinary retention typically involves catheterization. A protrusion or a bulge at the posterior aspect of the introitus is a helpful clinical finding. Prompt identification of imperforate hymen helps avoid unnecessary diagnostic tests and imaging. The standard treatment is a surgical hymenectomy.<sup>13</sup> Although complications such as bleeding, scarring, and vaginal stenosis can occur. Less invasive treatments, which include the application of a Foley catheter, can be used without

compromising the hymen's structure.<sup>14</sup> The timing of surgery is usually determined by the severity of signs and symptoms. In asymptomatic females who do not have mucocele, treatment is often delayed until puberty to prevent the development of hematocolpos or hematometra, which also reduces the need for general anesthesia. Long-term outcomes are generally good, although endometriosis and infertility are potential late complications. Adolescents with AUR typically visit for emergency treatment, and an imperforate hymen should be considered in cases of urinary symptoms in the absence of menstruation. A thorough history, genital examination, and catheterization can aid in accurate diagnosis and guide appropriate treatment.<sup>7</sup>

When diagnosing congenital anomalies of hematocolpos, the primary conditions to consider includes imperforate hymen, distal vaginal agenesis, transverse vaginal septum, and obstructed hemivagina which are taken as an associated renal anomaly (OHVIRA).<sup>15</sup> These findings are commonly found in Magnetic resonance imaging (MRI) or in clinical examination. MRI not only helps in diagnosis, but it also provides important information for management decisions. Surgical treatment is considered in case of congenital vaginal obstruction, and MRI assists in sequencing interventions.<sup>16</sup> Although computed tomography (CT) and ultrasound are most commonly used diagnostic tools, MRI has its advantages in imaging soft-tissue anatomy and revealing subtle findings that are associated with congenital anomalies. Hence, MRI is preferred to CT or USG before any surgical intervention.<sup>17</sup>

## CONCLUSION

An imperforate hymen is a rare obstructive disease of the female reproductive tract, which results in the collection of blood products in the vagina also termed as hematocolpos, which on later phase of disease results in collection of blood products in cervical canal and uterine cavity. Hematocolpos has an excellent outcome. Diagnosis of a hematocolpos can be easily missed because the patient may be presented with an acute abdomen, as in our case, or may present with cyclical menstrual pain. MRI plays an important role in the imaging of the pelvis in children. Without meticulous history taking and physical examination, diagnosis may be delayed, resulting in delayed treatment. It is necessary to make a differential diagnosis of hematocolpos in adolescent girls with cyclical abdominal pain associated with primary amenorrhea.

## CONSENT

Written informed consent was taken from the patient's guardian regarding the case publication.

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## CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

## AUTHOR CONTRIBUTIONS

DBB (concept, design, and writing); PRR (concept, writing, and review); BKY (Case collection, writing); SG (Case collection, writing).

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