CASE REPORT

Acute urinary retention in an adolescent girl and important learning points

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SUMMARY

We presented a case of a 13-year-old girl who attended the emergency department with acute urinary retention and 1400 mL residual urine after catheterisation. She had no significant medical history, neurological examination was normal and she had not reached menarche. She was found to have a haematocolpos on ultrasound scan which was compressing the urinary bladder. Examination under anaesthesia confirmed an imperforate hymen and therefore an incision was performed and the haematocolpos drained. She managed to pass urine normally the day following her procedure. In this article, we emphasise on the differential diagnosis in this case and the learning points derived from it.

BACKGROUND

Urinary retention is a rare symptom in young girls. It is a symptom not a diagnosis, a fact which more often than not forgotten in the initial assessment of the patient. In women, retention could be secondary to a pelvic mass causing compression on the urinary bladder. Imperforate hymen leading to haematocolpos and retention should be within the differential diagnosis considered by the referring clinician and needs to be excluded. In our case report we described the causes of urinary retention in young girls and the learning points from this case.

CASE PRESENTATION

A 13-year-old girl presented to the emergency department with lower abdominal pain and an inability to void for over 24h. She had no dysuria or frequency, though reported constipation. She was being investigated by her general practitioner for irritable bowel syndrome. Otherwise she was fit and healthy.

When examined in the emergency department, she was tachycardic but the rest of her vital signs were normal. Her abdomen appeared to be distended with a tender palpable bladder. She was catheterised with a 12F Foley urethral catheter and drained 1400 mL of clear urine. After catheterisation reassessment of her abdomen revealed no abnormality and her observations were normal. Neurological examination was normal and also her external genitalia were also described as normal.

Following admission to a paediatric ward she was reviewed by the urology team. It was revealed that the patient had not started her periods yet and there was no history of any cyclical abdominal discomfort. She also had recent constipation with

normal bowel habits previously. Given her age, the vaginal examination was not repeated. Her renal function tests were normal and her urine test was clear. She was given laxatives and an abdominal ultrasound scan (USS) was arranged to exclude any pelvic space occupying lesion causing her acute urinary retention.

INVESTIGATIONS

The USS revealed a vaginal distension which contained low level echoes and measured 7.7×9.4 cm in diameter (figure 1). The appearance was radiologically compatible with a hydrocolpos or haematocolpos causing compression on the previously catheterised bladder. The uterus outlined normally and there was no evidence of distension of the uterine cavity. The kidneys and liver appeared normal.

DIFFERENTIAL DIAGNOSIS

The findings of the scan were consistent with an imperforate hymen.

TREATMENT

The patient was reviewed by the gynaecology team and consented for an examination under anaesthesia (EUA), incision to imperforate hymen and drainage of haematocolpos. The EUA revealed an intact hymen, in which a cruciate incision was made. Old menstruation blood was drained from the vagina and a bimanual examination revealed a single small cervix. A washout was carried out and a dressing was applied to the introitus for 24h. There were no complications postoperatively.

Figure 1 Ultrasound scan pelvis of the patient showing the haematocolpos compressing the catheterised bladder.

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OUTCOME AND FOLLOW-UP

Trial without catheter was carried out the next morning. She managed to pass urine well with no residual volume and was discharged home. On follow-up she was well and was menstruating normally.

DISCUSSION

Urinary retention is defined in literature as the inability to empty the bladder voluntarily with a urine volume greater than that expected for the age or a palpably distended bladder.^{1 2} This can be acute or chronic. Causes can be classified as obstructive, infectious, inflammatory, pharmacological and neurological.³ When not managed appropriately it can lead to loss of bladder function and acute kidney injury. In men over the age of 50, urinary retention is common but in women this presentation is rare.

Acute urinary retention in women due to obstruction is rare and is usually associated with other pelvic organs causing extrinsic pressure on the bladder, bladder neck or urethra. Such causes are cystocele, rectocele or uterine prolapse, gynaecological malignancy, large uterine fibroids or ovarian cyst or even a retroverted impacted gravid uterus. Common obstructive causes that are present in both sexes are bladder calculi or neoplasm, faecal impaction, intra-abdominal mass, urethral stricture and a foreign body.^{1 3}

Acute urinary retention in children is a rare urological presentation. It is defined as the inability to void for over 12 h. Causes of acute urinary retention in children are classified as primary and secondary. Primary causes are urinary tract infection, constipation, neurological dysfunction, Fowlers' syndrome and adverse reaction to drugs such as anticholinergics and antihistamines. Secondary causes are; bladder neoplasm, focal inflammatory reaction, incarcerated inguinal hernia, haematocolpos and pelvic masses.^{1 3-5}

A retrospective study by Asgari *et al*¹ in 2005 in Iran reviewed 86 cases of urinary retention in children up to 14-years-old from 1996 to 2003. Their study included 58 males and 58 females with a median age of 4. More specifically in girls the most common causes were ureterocele in six cases and trauma in five cases. An imperforate hymen was found in three cases and was associated with amenorrhoea and abdominopelvic pains. Two of these patients had hydrocolpos and one presented with haematocolpos with haematometra. In other studies most common cause of retention has been reported to be neurological disorders.⁶

An imperforate membrane may exist at the lower end of the vagina which is usually referred to as an imperforate hymen. It is a rare congenital anomaly with an incidence of 1 in 2000 female births.^{5 7-9} The hymen is an embryological remnant of mesodermal tissue that normally perforates during the later stages of embryo development.^{8 9} Female infants may present with a bulging hymen due to accumulation of secretions by the fetal uterovaginal mucosa and this is described as a mucocele.^{9 10} It is usually asymptomatic prior to menarche and then presents with cyclical lower abdominal pain, cramps and urinary symptoms due to pressure from the collection of blood in the vaginal vault, referred to as haematocolpos. The frequency of imperforate hymen with haematocolpos is reported as 0.14%.¹¹ It may present after the first menstruation but most commonly in the second or third.¹² The differential diagnosis of primary amenorrhoea, pelvic pain and pelvic mass in puberty should also include a transverse vaginal septum, longitudinal vaginal septum, vaginal agenesis and cervical atresia.⁹

Urinary retention presents secondary to the haematocolpos due to mechanical compression of the urethra caused by pressure on the posterior wall of the bladder. In literature 46–58%

of cases with haematocolpos will present with retention.^{4 7 11 13 14} Other urinary symptoms include frequency, urgency and dysuria, therefore this is misdiagnosed as a urinary tract infection, although this could coexist with retention due to stasis of urine.⁸ Other reported symptoms in literature due to haematocolpos are lower back pain, constipation and overflow incontinence due to urinary retention.^{4 15}

An imperforate hymen can be detected by an external inspection of the patients' genitalia and appears as a bulge along the posterior aspect of the introitus.^{4 5 12 14} Although an external examination of the genitalia is not a comfortable examination for a young girl, it is sensible to perform immediately following catheterisation. In some cases, a palpable lower abdominal mass is present which persists even after catheterisation.¹⁴ Pelvic and abdominal USS usually demonstrate a dilated uterine cavity and vagina and in many cases mild bilateral hydronephrosis.¹⁵ Rarely this congenital abnormality is associated with other Mullerian abnormalities and MRI is useful to exclude these after the acute episode.^{5 9 10 15}

Management includes catheterisation of the bladder in cases of retention and then a cruciate hymenectomy under general anaesthesia with evacuation of menstrual products. In most reported cases there were no complications following this procedure and the patients were soon discharged.

Our patient presented with acute urinary retention and lower abdominal pain, describing primary amenorrhoea along with acute constipation. When she was catheterised in the emergency department there was no documentation regarding any hymen abnormality therefore we believe this went unnoticed. She did not have a palpable abdominal or pelvic mass after her catheterisation. Given the failure to identify the imperforate hymen, a working diagnosis of urinary retention secondary to constipation was made, though subsequent USS confirmed haematocolpos. It is likely the constipation was due to pressure on the rectum from the haematocolpos.

Although a review of literature revealed at least 41 similarly reported cases, this is a condition that can still remain unrecognised by the referring physician.^{1 2 4-22}

Learning points

- ▶ Acute urinary retention in adult and adolescent female is rare and an extrinsic obstructive cause needs to be excluded without delay.
- ▶ Any adolescent girl presenting to a general practitioner or the emergency department with lower abdominal pain, urinary retention and primary amenorrhoea, an examination of the genitalia should be considered to exclude an imperforate hymen.
- ▶ Up to 50% of those with haematocolpos present with urinary retention.^{4 7 11 13 14}
- ▶ Three features should be sought to diagnose an imperforate hymen with haematocolpos; primary amenorrhoea, lower abdominal pain (often cyclical in nature) and an interlabial bulge on examination of the external genitalia. An ultrasound scan is useful in confirming the diagnosis and can also visualise the upper renal tracts.
- ▶ The referring and admitting physician should also be aware of neurological disorders, such as cauda equina syndrome and other lesions of the spinal cord which can present with retention. Therefore a full neurological examination is considered obligatory.

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Competing interests None.

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