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Case Report **OPEN ACCESS**

Vesicovaginal reflux as a confounding cause of hydrocolpos–A case report

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ABSTRACT

Vesicovaginal reflux (VVR) is a dysfunction of voiding, generally seen in prepubertal females. It results in distension of the vagina due to accumulation of urine, which can be easily confused with hydrocolpos on sonography. Although VVR is rarely reported in clinical practice, it needs to be differentiated from obstructive causes of hydrocolpos to choose the correct treatment option. We report a rare case of transient vesicovaginal reflux in a 13-years-old girl who had presented with vague complaints of urinary incontinence intermittently. Probable clinical diagnosis was hydrocolpos and VVR was diagnosed accurately by radiological examinations. Appropriate history-taking and timely imaging by an expert radiologist will help in accurate diagnosis and initiate an appropriate treatment option.

Keywords: hydrocolpos, incontinence, vesicovaginal reflux

INTRODUCTION

Vesicovaginal reflux (VVR) is a functional voiding disorder that occurs because of abnormal retrograde reflux of urine into the vaginal vault during bladder distension and micturition. It is usually seen in pre-pubertal girls without any major anatomical or neurological abnormality [1]. VVR can produce vaginal distension mimicking hydrocolpos on sonography. It is crucial to differentiate VVR from other obstructive causes of hydrocolpos. We report a case with evidence of vaginal collection of urine identical to hydrocolpos, which was diagnosed as VVR after radiological imaging.

CASE REPORT

A 13-year-old adolescent girl, (weight 40 kg, height 150 cm, and BMI 17.8) had presented with a history of recurrent urinary tract infection for the past five to six months. There were vague complaints of urinary incontinence with no specific relation to increased intrabdominal pressure (during coughing, straining, or laughing). There was no definite history of day time wetting. She had attained menarche at 11 years of age and her menstrual history was normal. She also gave a history of hematuria occurring only during her menses. Her general physical examination was normal. Her gynaecological examination also revealed normal external genitalia without labia adhesions. There was no evidence of imperforate hymen.

Ultrasonography (USG) of the abdomen and pelvis revealed a grossly distended, fluid-filled vagina which was suggestive of hydrocolpos (**Figure 1a**). The uterus, ovaries, and urinary bladder were normal. The post-micturition USG showed complete evacuation of vaginal fluid and complete disappearance of vaginal distension (**Figure 1b**). Post-void residual urine was less than 30 cc in the urinary bladder. Computerized tomography (CT) of abdomen and pelvis also revealed distension of vagina with fluid tentatively suggesting of hydrocolpos on pre-void imaging without contrast (**Figure 1c**). Delayed post-contrast but pre-void contrast-enhanced computerized tomography (CECT) imaging did not show any obvious vesicovaginal fistula (**Figure 1d**). However, the post-void CT imaging demonstrated complete emptying of vaginal fluid. All these findings confirmed the diagnosis of transient hydrocolpos due to vesicovaginal reflux (**Figure 1e**). The patient was then treated symptomatically for the current urinary discomfort with antispasmodics and urine alkalizers. Patient and the parents were reassured regarding the reflux.

DISCUSSION

Hydrocolpos can be defined as an accumulation of any fluid (blood/secretions/urine) in the vagina resulting in cystic dilatation and distension of the vagina [2]. The condition is commonly associated with obstructive lesions in the vagina and urogenital malformations [2]. A vesico- or urethro-vaginal reflux is a cause for a non-obstructive variety of hydrocolpos. Obstructive lesions are known to present early in life but vesicovaginal reflux usually presents in prepubertal or adolescent girls [2]. Presence of proper menses and the absence of hydrometra will rule out imperforate hymen. Similar was the case in our patient.

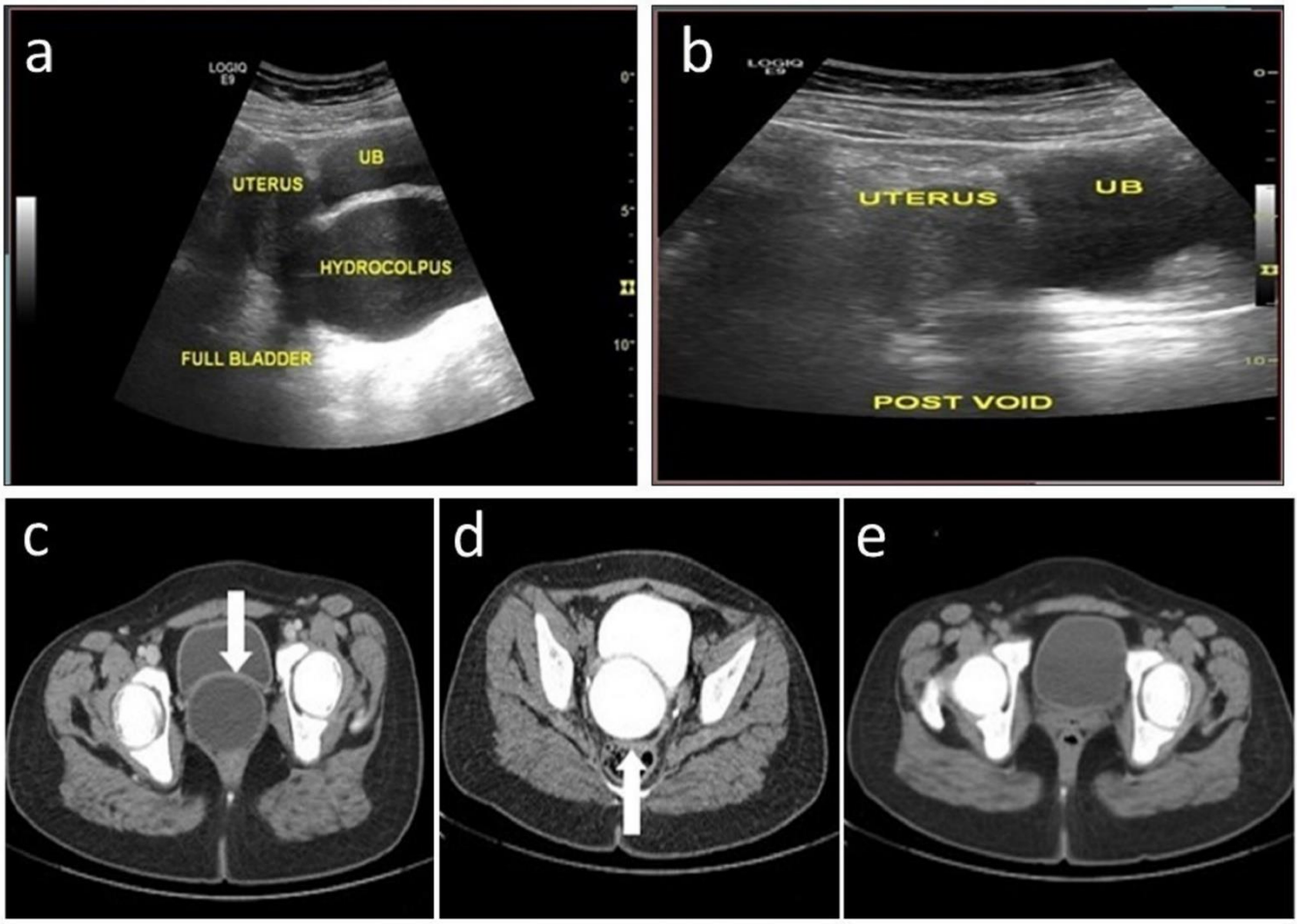

Figure 1. Sonography and CT scan images demonstrating vesicovaginal reflux: a. Pre-void USG showing the full bladder and vaginal distention with fluid (urine) presenting as hydrocolpos; b. Post-void USG showing the disappearance of the vaginal collection after micturation thus the transient nature of vesicovaginal reflux; c. Non-contrast CT scan showing the physiologically distended normal urinary bladder and distended fluid-filled vagina s/o hydrocolpos (white arrow); d. Post-IV contrast CT scan showing contrast-filled normal urinary bladder and vaginal collection (white arrow) with no obvious vesico-vaginal fistula; and e. Post-void CT scan showing complete emptying of vaginal fluid demonstrating transient hydrocolpos due to vesicovaginal reflux

The vesicovaginal reflux has been explained as reflux of urine into vaginal fornices while the patient is passing urine leading to the formation of an urocolpos [1-4]. The condition can occur in supine as well as upright positions [1-4]. A few hypotheses have been mentioned in the literature, among them behavioural dysfunction and improper toilet training is well known hypothesis [1-4]. In addition, abnormal position of urethral meatus in relation to vaginal orifice and labia can also lead to filling up of vagina during voiding in supine position. Tightly apposed labia (physiologically or acquired labial synechiae) has also been reported in literature to be associated with VVR. Bulky labia in obese patients can mimic and act like tightly apposed labia. Patients with pelvic floor dysfunction or cerebral palsy may also experience VVR [1-4]. But we did not observe any of the above issues in our patient and even the risk factors like obesity or behaviour disturbances were not observed. Patient and parents were counselled regarding proper toilet training as a prevention strategy for VVR.

The symptomatology of these patients is nonspecific, e.g. recurrent urinary infections, asymptomatic bacteriuria, bed-wetting even in daytime, and even postvoid dribbling which is then confused with incontinence [3]. A specific point that can be elicited is a passage of urine through the vagina after the patient has voided naturally through urethra. Due to such episodes, local hygiene is compromised causing more synechiae and discomfort.

The condition needs to be differentiated from vesicovaginal fistula and abnormalities of ureteric insertion [3]. The latter conditions can also present as urocolpos and may require surgical intervention, adding to the parent anxiety. A vaginal cavity, distended with fluid and lying posterior to the distended bladder can mimic a fluid-filled rectum on sonography [5]. Presence of essentially normal anatomy of the urogenital tract (clinically and radiologically) and a pre-void urocolpos that disappears on voiding properly will easily differentiate VVR from other conditions [1-4].

In [2], the researchers had observed VVR in four patients of ages 10, 12, 6, and 5 years. They had diagnosed VVR on voiding cystourethrogram. Details about further management were not available [2]. In [1], the researchers had mentioned VVR in three patients (11, 13, and 5 years) who had presented with urinary infection and daytime wetting. The 11 years-old-girl, who was observed to be obese, also had history of post-void dribbling. The 5-years-old girl was also suffering from severe vulvar synaechiae which were dealt surgically. All these three patients were diagnosed on magnetic resonance imaging and were counselled regarding proper toilet training [1].

In [5], the researchers had observed the VVR on Ct urography in a 14-years-old girl (weight 45 kg), presenting with continuous dribbling of urine from the vagina. Her urodynamic study revealed interrupted voiding flow curves [5]. The 15-years-old patient was diagnosed to have VVR by [3] on CT urography. She was obese (weight 52kg, height 1.34m, and BMI 28.9) and complained of dysuria and urinary infection since childhood. In the report by [4], the diagnosis was confirmed on MRI in the 16-years old patient who had presented with history of bed-wetting and urinary incontinence since childhood. All these patients had findings of hydrocolpos on USG which disappeared after voiding. Our patient also had similar complaints and USG findings as mentioned in past reports. We confirmed our diagnosis on CT scan. Though we were sure of the diagnosis on USG, CT scan seconded our observation.

The sonography by an expert radiologist with high index of suspicion can diagnose the condition. A post void USG demonstrating the disappearance of the vaginal dilatation will rule out hydro/haematocolpos [1-4]. Sonography undoubtedly is an easily available, cost-effective and reproducible tool for primary assessment. To elicit this reflux, the study [1] had suggested the use of voiding sonography (with or without contrast) with the thighs tightly approximated to provoke VVR and with the legs wide open to promote easier emptying.

CONCLUSIONS

Since the vesicovaginal reflux is functional in origin, besides the symptomatic treatment of any urinary infection, the management will focus on behavioural therapy, proper local hygiene, proper toilet training and a considerable amount of reassurance.

Micturating cystourethrograms are not preferred due to invasiveness and radiation issues in adolescents. Magnetic resonance urography or CECT urography are usually reserved for cases with suspected urogenital abnormalities and those with inconclusive sonography. An expert radiologist is a must for performing and reporting these studies.

The importance of proper history taking and clinical assessment cannot be over-emphasized. Along with this, radiological imaging by an expert radiologist will rule out obstructive causes, which need surgical management.

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