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CASE REPORT PEER REVIEWED | OPEN ACCESS

Fetal urinary ascites due to posterior urethral valve: A case report

Imane Joudar, Chadia Khalloufi, Mohamed Jalal, Amine Lamrissi, Said Bouhya

ABSTRACT

Introduction: Urinary peritonitis is a rare event that can occur most often in congenital malformation of posterior urethral valves (PUVs) due to bladder rupture or upper urinary tract. This malformation is most common in male newborns. The prognosis depends on the degree of oligohydramnios and precocity of installation with which posterior urethral valve is always associated. It is a factor that affects significantly the intrauterine development of the lungs and the severity of kidney impairment. Nowadays, diagnosis is prenatally possible, which leads to early intrauterine treatment with urinary decongestion, thus prognosis is significantly improved.

Case Report: In this paper we talk about the case of a male fetus with posterior urethral valve manifested as fetal ascites after rupture of the urinary bladder wall giving rise to urinary peritonitis.

Conclusion: The ultrasound diagnosis of fetal ascites is relatively easy; however, some images may incorrectly lead to the diagnosis of fetal ascites that's why it is important to know them as well as the different etiologies.

Keywords: Antenatal diagnosis, Fetal ascites, Fetal urinary peritonitis, Posterior urethral valve, Potter syndrome

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INTRODUCTION

The term "fetal ascites" usually refers to ascites without generalized edema. The first report of urinary ascites dates back to 1681 when Mauriceau gave the first diagnosis of fetal ascites. It most often occurs from rupture of the posterior fornix due to increased hydrostatic pressure in the intra-renal collecting system causing leakage of urine into the peritoneal cavity [1, 2].

The existence of posterior urethral valves is a congenital malformation of the urinary system occurs in 1 in 5000 to 8000 births that can threaten the life of the newborn [3]. Prenatal ultrasound diagnosis can be suspected in the face of bilateral hydronephrosis, dilated ureters, and urinary bladder. Surgical treatment is indicated, while the long-term prognosis depends on the degree of renal dysplasia and the severity of pulmonary hypoplasia.

We report here a case of fetal ascites secondary to a posterior urethral valve. It is important to know its differential diagnoses. However, the present case confirms that posterior urethral valve (PUV) is also associated with risks of renal failure to the point of failure, presenting a decisive factor for parents to terminate the pregnancy. The work has been reported with respect to the SCARE 2020 criteria [4].

CASE REPORT

Mrs M.A., a 24-year-old primiparous with no particular pathological history, was referred to our department following the discovery of fetal ascites on ultrasound. Mother's blood group was O positive, COMBS test was negative, parvovirus and cytomegalovirus (CMV) screening came back negative.

An ultrasound was done showing a single active male fetus of equivalent size at 32 weeks gestation, anhydramnios was noted, the fetal cardiac profile, the oral region, and the spine appeared normal. Absence of signs of fetal anemia, umbilical, and cerebral Doppler were normal.

The abdominal circumference measured 348 mm, with a grossly enlarged bladder and urinary ascites was suspected following rupture of the bladder in the presence of posterior urethral valves thus giving urinary peritonitis in a male fetus (Figure 1).

Fetus was with significant intraperitoneal fluid accumulation and moderate bilateral renal pelvis dilation. Fetal bladder was with unevenly thickened walls and soft edges (Figure 2).

The patient was hospitalized to induce fetal lung maturity. An extraction by caesarean section was performed allowing the birth of a baby, male, 2200 g, at 34 weeks of gestation. He had an Apgar score of 4/10 in the first minute, and he died at a few hours after birth due to pulmonary hypoplasia.

At birth, significant abdominal distension was observed with a potter syndrome (flat ears, broad forehead, wide-set eyes, wide flat nose, receding chin, hands and club feet, etc.) (Figure 3).

DISCUSSION

Urinary peritonitis in PUV can occur because of ruptured calyceal fornixes or transudation across the intact upper tract. It can also occur following the rupture of the posterior wall of the bladder [5]. It is necessary to know how to distinguish fetal ascites from certain images:

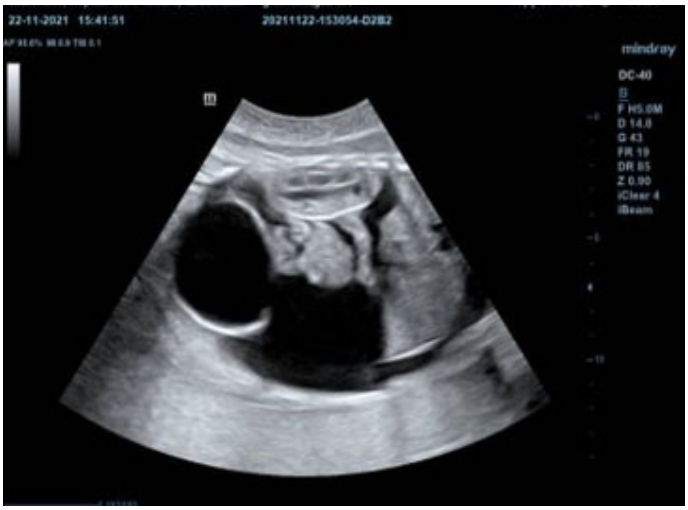

Figure 1: 32 GW, dilatation of the urinary bladder and urinary peritonitis after rupture of the urinary bladder wall in a male fetus with PUV.

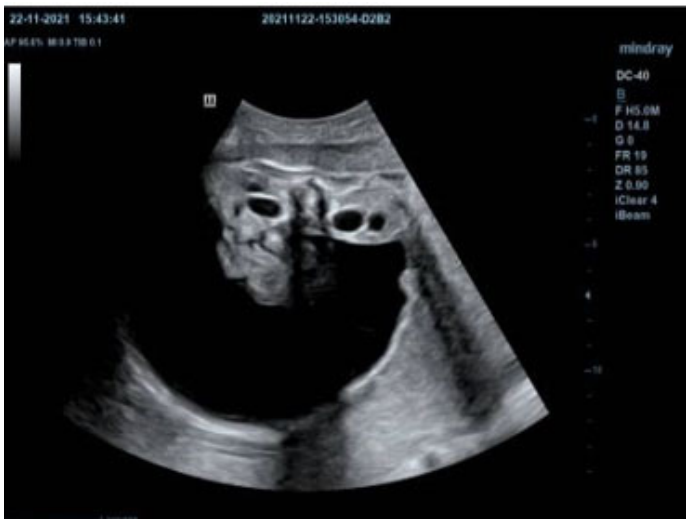

Figure 2: 32 GW, fetal hydronephrosis and compressed renal parenchyma in a male fetus with posterior urethral valves.

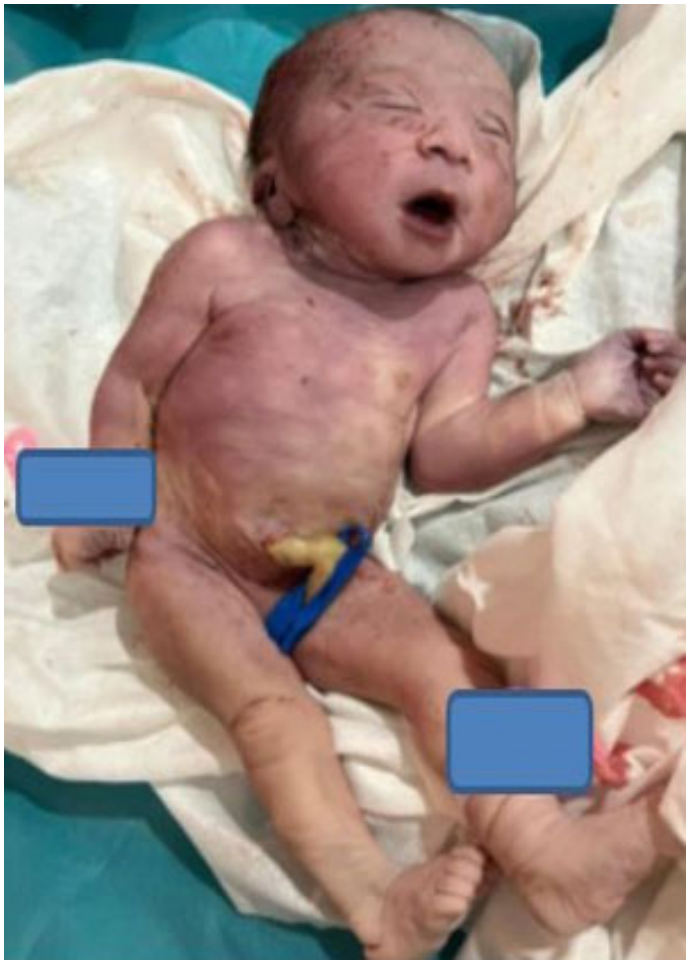
Figure 3: Aspect of abdominal distension with polymalformatif aspect of the fetus (limb malposition, flattened face) related to the chronic anamnios making the diagnostic of Potter syndrome.

- In front of a partitioned ascites: an ovarian cyst, a cyst of the mesentery, or a digestive dilatation.
- Faced with free ascites: an extraperitoneal fluid formation such as uretero-hydronephrosis, or more rarely, a retroperitoneal fluid tumor.

The causes of fetal ascites are multiple: rhesus immunization fetal anemia, trisomy 21, Turner syndrome, infections (parvovirus, CMV, toxoplasmosis, syphilis), cardiac anomalies, fetal mass: thoracic or abdominal, perforation, meconium peritonitis (Mucoviscidosis), urinary origin: PUV, junction syndrome, cloaca or idiopathic.

Posterior urethral valve consists of an abnormal relative obstructive membrane, which is located inside the posterior urethra in male fetuses; during embryogenesis, the caudal end of the Wolff pore is absorbed into the primordial cloaca at the site of the future seminal vesicle in the posterior urethra [6]. They were first described by Young in 1919, who classified them into three types [7].

Newborns with lower urinary tract obstruction due to PUVs may develop severe respiratory distress immediately after birth, as a result of pulmonary hypoplasia, a consequence of oligohydramnios. Prenatal ultrasound examination may show hydronephrosis, dilatation of the ureters, enlargement and thickening of the bladder, proximal urethra, and oligohydramnios [5].

In a baby with obstructive uropathy, spontaneous bladder rupture can occur during intrauterine life or during delivering when the intrauterine pressure may go beyond 100 mmHg [7].

Gürgöze et al. [8] reported a rare case of urinary ascites secondary to non-bladder renal rupture in a neonate with posterior urethral valves. The authors pointed out that urinary ascites can be caused not only by a rupture of the bladder, but also extravasation of urine from the upper urinary tract.

For the treatment of urinary peritonitis, it can be in pre- or postnatal:

Prenatal treatment: the intrauterine catheter, which drains the urine from the fetal bladder directly into the amniotic fluid, presents a complication rate of 21–59%.

After birth treatment:

- **Bladder drainage:** insertion of the catheter into the bladder and a cystourethrography determined if the diagnosis is correct.
- **Excision of valves:** the obstruction is treated with the use of small cystoscopes cross-section ad excision is possible [9].
- **Cystostomy:** if immediate surgery is not possible, bladder drainage is used as a temporary treatment. An intravesical catheter is inserted which can remain after 6–12 weeks.

The bladder dysfunction that can occur is due to a decrease in the sensitivity and elasticity of the bladder wall. Kidney failure may occur in approximately 10–47% of affected patients and may require kidney transplantation [9, 10].

CONCLUSION

The formation of urinary ascites in PUV serves as a trigger mechanism to relieve intravesical and intrarenal pressures. The main cause of urinary peritonitis is the presence of posterior urethral valves. This malformation can also lead to massive dilatation of the entire fetal urinary tract and be responsible for chronic renal failure. In addition, pulmonary hypoplasia due to oligohydramnios during pregnancy leads to increased perinatal morbidity and mortality. Early prenatal diagnosis by ultrasound is now possible, allowing guidance for management and early decision making by parents.

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Author Contributions

Imane Joudar – Conception of the work, Design of the work, Acquisition of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that

questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Chadia Khalloufi – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mohamed Jalal – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Amine Lamrissi – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.

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