

Neonatal ascites and oligohydramnios: The kidney connection.



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Abstract:	<p>Posterior urethral valve pathologies are the most frequent childhood obstructive uropathy reported, and we should suspect their presence on diagnosing foetal ascites and oligohydramnios. Early action is critical in determining the long-term development and the degree of impairment of renal function. We present the case of a male newborn, of 34 weeks of gestation, with a prenatal diagnosis of foetal ascites, fluid in renal fossa and oligohydramnios. Subsequent studies demonstrated the presence of posterior urethral valves with associated significant vesicoureteral reflux. There was no secondary renal damage. Intrauterine decompression of the urinary tract appeared to have exercised a protective role against kidney damage. This finding supports the role of foetal decompression surgery in early and severely obstructive forms to improve the prognosis of renal function in the long term.</p> <p>Abstract.doc</p>

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Introduction

Foetal ascites is an abnormal accumulation of fluid in the peritoneal cavity of the foetus. Its incidence is unknown with accuracy; however, it is a rare entity in perinatology. There are many causes that may trigger it: congenital infection, peritonitis, gastrointestinal malformations, metabolic diseases etc. Up to 25% of cases are associated with anomalies of the genitourinary tract as the result of an obstruction, and up to 70% of cases to the presence of posterior urethral valves [1]. Using prenatal ultrasound scans, we establish the diagnostic suspicion in a foetus with ascites, oligohydramnios and even fluid at the level of the renal fossa. Nevertheless, postnatal cystography must confirm the presence of the valves or other anomalies that condition the obstruction.

The condition is initially managed using decompression of the urinary tract by urinary catheter. Occasionally this even requires evacuation paracentesis given the severe associated respiratory compromise. It is possible to perform the intrauterine decompression and improve the prognosis of renal function in cases of early diagnosis [6].

Clinical case

New born preterm infant born after 34 weeks of pregnancy through caesarean section due to foetal pathology. This is the third gestation of the 28-year-old mother. The mother did not have any findings of interest in her medical records. We detected severe foetal ascites with an important compressive effect at the diaphragmatic level, bilateral hydrocele and oligohydramnios in week 32 of pregnancy. Until this time, the gestation had progressed without incident, with the exception of several episodes of nephritic colic. The maternal serology was negative for HBV, HCV, HIV and syphilis, and immune to Toxoplasma, Epstein-Barr Virus, Parvovirus B19 and Herpes Simplex Virus. A male neonate was born with poor respiratory effort, bradycardia and hypotonia, which required resuscitation and intubation in the delivery room (Apgar 2/7). The birth weight was 3,426 grams. The newborn presented massive ascites with severe abdominal bloating, increase of collateral circulation, and scrotal oedema. We observed neither visceromegaly nor subcutaneous oedema. We gave the newborn mechanical ventilation, although he suffered progressive deterioration leading to increasing ventilation requirements, despite performing an evacuation paracentesis. Therefore, we used high frequency ventilation, which we maintained for 4 days. The patient required mechanical ventilation for a total of 7 days. At 24 hours after birth, we observed a tendency towards hypotension, which required inotropic support for 6 days. We gave bladder catheterization from birth and maintained adequate urine output, and renal function biochemical parameters within the normal range. The cyto-biochemical analysis of the peritoneal fluid revealed characteristics of transudate with creatinine levels higher than plasma levels. We began a diagnostic protocol for foetal ascites. On using abdominal ultrasound, we detected kidneys of slightly increased echogenicity, right septated urinoma associated with ascites, possible dilatation of the posterior urethra, and bladder walls that were probably thickened. These findings are suggestive of posterior urethral valves and may be subsequently confirmed by mictional cystourethrography that also reveals the presence of a bladder trabeculation with multiple diverticula, right grade IV vesicoureteric reflux with intrarenal reflux and urinary leak at the level of the renal pelvis as a cause of the ascites (Figure 1). Virological and parasitological studies of the ascitic fluids were negative. We programmed surgery and on viewing the presence of type 1 valves through urethroscopy performed their resection. The subsequent recovery of the patient was favourable with appropriate spontaneous urination. A month after

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3 surgery, we performed a gammagraphy, together with biochemical analysis of blood
4 and urine, which proved that the kidney function was normal.
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7 **Discussion**

8 Foetal ascites are a rare disorder that, when they are present, oblige us to rule out a
9 possible urinary origin. This is because a quarter of all the cases reported are due to
10 disorders of the genitourinary tract. In these cases, the presence of ascites is related to
11 the urinary system at the level of the bladder or above, which are generally a result of an
12 obstruction at the distal level. Far fewer cases may be due to other anomalies such as the
13 presence of a persistent cloaca, which allow the reflux of urine into the peritoneal cavity
14 in the absence of a perforation.
15

16 Posterior urethral valves are the most common cause of congenital urinary obstruction
17 of the urinary tract and affect about 1 in every 5,000-8,000 male newborns [4]. They are
18 characterized by the presence of some mucous folds at the level of the posterior urethra
19 and, depending on their location, are classified as type 1 or antero-inferior (the most
20 frequent), type 2 or antero-superior and type 3. The impact of the urethral valves is
21 highly variable, ranging from minimum mictional alterations, hypertrophy of the
22 detrusor urinae muscle, formation of diverticula, vesicoureteral reflux, to kidney
23 damage with varying degrees of renal failure. In relation to long-term kidney damage,
24 although the initial creatinine clearance rate and radiological alterations do not have
25 prognostic value, normalization of the urine and creatinine values after catheterisation
26 or surgical decompression, along with the improvement of imaging, and the absence of
27 symptoms, indicates favourable recovery [2]. We should perform a gammagraphy to
28 check the normality of kidney function. Chronic kidney damage occurs in 25-40% of
29 cases and depends on, among other things, the degree of obstruction and its duration.
30 Thus, early clearance is essential in preserving renal function and preventing lung
31 hypoplasia due to the oligohydramnios. Prenatal diagnosis is, therefore, highly
32 important in the management of this pathology [5]. The presence of oligohydramnios
33 before the 28th week of gestation should make us suspect an abnormality of the urinary
34 system and its detection before 24 weeks is associated with a worse prognosis [7].
35

36 There are cases in the literature of bilateral hydronephrosis and severe oligohydramnios
37 in babies under the age of 32 weeks that have undergone uterine surgery with both
38 satisfactory results, and preservation of kidney function [8]. Nonetheless, if there is
39 isolated hydronephrosis with a suitable volume of amniotic fluid, we recommend taking
40 a conservative approach with ultrasonic follow-up.
41

42 At birth, the first step will be the decompression of the urinary tract by catheterisation,
43 with cystostomy rarely being needed. In the case of foetal ascites with respiratory
44 compromise, evacuation paracentesis may be required. We must start adequate
45 hydroelectrolytic support and empirical antibiotherapy. Once we have stabilized the
46 patient we can complete the study using renal ultrasonography and mictional
47 cystouretrography. This will confirm the presence of the valves or other obstructive
48 pathology. Thus, we may perform early endoscopic resection of the valves.
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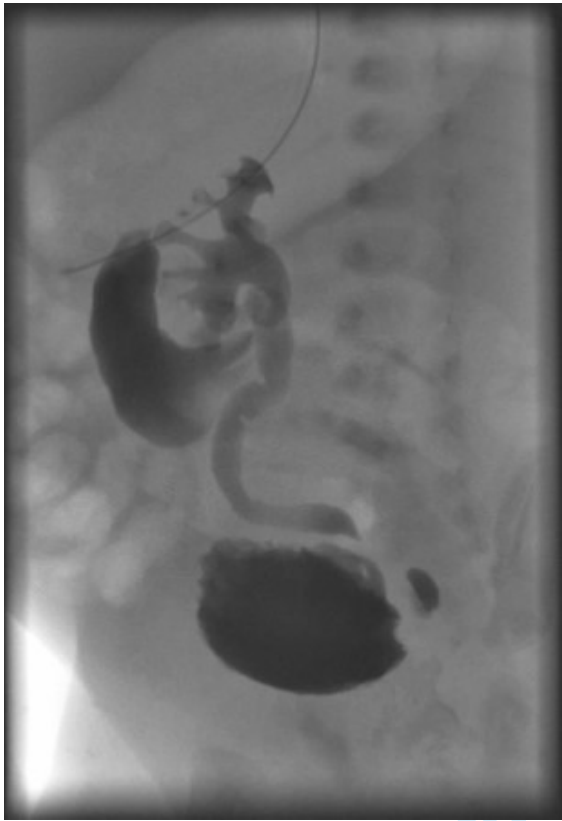
50 Therefore, the presence of posterior urethral valves is a pathology to take into account
51 with a prenatal diagnosis of foetal ascites and oligohydramnios, since although its early
52 detection is related with the most serious cases and worse prognosis, early action
53 (urinary tract decompression) may produce a better outcome in the long term.
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55 In our case, the urinary tract decompressed through a spontaneous perforation of the
56 renal pelvis that gave rise to the foetal ascites, and was not due to a surgical procedure.
57 The favourable results for the preservation of renal function, which have already been
58 described by other authors under similar circumstances [3], are those we expect for
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3 intrauterine procedures. These must be considered in selected cases, not only to improve
4 short-term survival (less development of pulmonary hypoplasia and its neonatal
5 complications), but also in the long term (lower risk of chronic kidney damage).
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