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Case Report

Megabladder in a Female Fetus: A Case Report and Mini Review of Literature

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Abstract

Megabladder in the first trimester of pregnancy is defined by a size of this organ >7 mm between 11 and 13 + 6 weeks of gestation; in fetuses with bladder size >12.5 mm, the rate of hydronephrosis and oligohydramnios at this stage is higher, indicating possible abnormalities in other systems.

Objective: To report the case of a female fetus that presented a corresponding clinical case with megabladder.

Materials and Methods: A case of a female fetus of 14.3 weeks with a megabladder with a diameter of 40 mm is described.

Results: The finding of the anomaly constitutes a negative and incompatible prognostic factor with intrauterine and postnatal life, it was also evidenced ascent of the diaphragm and thoracic content with an hydramnios.

Conclusion: It is shown that it is a case of urethral atresia, for which the voluntary interruption of pregnancy is advised.

Keywords: Megabladder; Urethral Atresia; Bladder Diameter

Introduction

The fetal bladder can be identified in the pelvis at 11-12 weeks of gestation [1], although urine production begins between 8 and 10 weeks. Megabladder during the first trimester of pregnancy occurs in 1 in 1,800 pregnancies [2]. Half of these cases are solved automatically. Among the findings a bladder diameter of less than 6 mm at 10 to 14 weeks of gestation is considered normal [3]. A diameter of 8-12 mm in the first trimester resolves spontaneously in week 20, while a diameter greater than 17 mm indicates urethral obstruction that may appear and should have individualized treatment in the postnatal life [4]. The most common underlying diagnosis is posterior urethral valves (57%), followed by atresia/urethral stenosis (7%) “”abdomen syndrome (4%); mega cysts-microcolon-intestinal-hypo-peristalsis syndrome (MIHS) (1%). Karyotype abnormalities are found at 15% and include trisomy 18, trisomy 13 and trisomy 21. Typical ultrasound findings include a male patient with bilateral hydronephrosis, enlargement, dilation of the posterior urethra, and thinning of the bladder wall. However, the most likely diagnosis based on first trimester ultrasound for megabladder is severe urethral atresia.

Epidemiology

Megabladder in the first trimester of pregnancy is defined by a bladder size > 7 mm between 11 and 13+ 6 weeks of gestation after checking the complete emptying of the same during the examination, the fetal bladder is empty every 15 to 20 minutes; therefore, a second ultrasound in the same environment is mandatory in case of non-visualization of the bladder [4], its

incidence is 1/1600 to 1/3000 pregnancies. The main etiology is obstructive, in 60% of cases the posterior urethral valves are described with a higher incidence in male fetuses and urethral atresia or urethral stenosis and cloaca anomalies in female fetuses with the presence of megabladder, when the etiology is of non-obstructive origin that corresponds to 30% of the cases, mainly due to syndromic disease such as (mega cysts-microcolon-intestinal hyperistalsis syndrome, abdomen syndrome in cirill passes), and finally, idiopathic or transient in 10% of cases [5].

Diagnosis and predictive factors

The diameter of the bladder seems to be a predictive marker of the neonatal outcome. Fetus with smaller mega cysts (7 to 10 mm) are significantly more likely to progress towards a favourable outcome. Several authors have evaluated the prognostic factors and neonatal results associated with megabladder, finding that, in foetuses with vesical size > 12.5 mm, the rate of hydronephrosis and oligohydramnios in the ultrasound of the first trimester is higher, which involves these foetuses to suffer abnormalities in other systems such as in the collector systems and also in the respiratory parenchyma those that condition them in the future a poor prognosis both intrauterine and intra-uterine death, severe pulmonary dysplasia and neo-natal as terminal renal insufficiency, however the foetus with a vesical diameter less than 12,5 mm may have a favourable evolution, with or without urological problems described as abnormal appearance of the renal parchment that could consider disturbances of the own renal function than to advance in a prognostics in the intra-uterine and neonatal pathway [6].

Urethral atresia has an ultrasound appearance very similar to that of the posterior urethra valves (diagnostic often in male foetuses), however, the diagnosis of urethral atresia has to be taken into account in female foetuses when an eco-graphic sign can indicate an obstruction of the bladder exit tract such as the Megabladder ; unlike what occurs in the posterior urinary valves, which are much more frequent and are usually complete which can lead to early detection of a megabladder until in the first trimester and because it is a complete obstruction generally has a slightly more adverse and bad prognosis with regard to posterior urethral valves [7].

Case Report

Patient 36 years old, without a history of pathology, second-guest with history of abortion in the year 2017 for pregnancy of unknown location, surgical history of polypectomy for abnormal uterine haemorrhage, without complications, admission to the consultation of prenatal control. Current gestation of 10.3 weeks by early ultrasound in which is evidenced generalized subcutaneous edema with nucal predominance of the foetus, so it is recommended group screening STORCH and ecographical screening in week 11-13+6, PAPP and Beta free, additional risk calculation. It is continued in prenatal control, with a pregnancy of 14.3 weeks in ultrasound findings of single live foetus female sex, it is evidenced Megabladder with a diameter of 40 mm, bilateral dilation of kidney pelvis, displacement of diaphragm and thoracic content. NIPT 46 XX is received without pathological findings, susceptibility to toxoplasma remaining negative infectious tests.

For ultrasound findings and markers of poor prognosis described in the literature is offered voluntary interruption of pregnancy by marked dilation of 40 mm of Megabladder, ascension of diaphragm and structures in the chest, appearance of an hydramnios in the second trimester which condition to kidney dysplasia and secondary pulmonary hypoplasia which confers incompatibility with intrauterine and post-natal life.

Results

In the case presented in this review it is a female foetus 46XX given by karyotype without other type anomaly where a Megabladder of more or less 40 mm is evidenced with which it constitutes as a factor of negative prognosis and incompatible with life, achieving the ascension of the diaphragm, in addition to thoracic content with an hydramnios which would subsequently confer pulmonary hypoplasia incompatibility with intrauterine and post-natal life. Urethral atresia is the most serious form of obstructive uropathy in uterus, which manifests itself as a large vesical distention associated with bilateral hydroureteronephrosis and oligohydramnios which confers for this foetus severe pulmonary hypoplasia and mortality in utero and/or, to birth due to progressive renal failure. It is very unlikely that the infant will survive or that there will be an intrauterine life, this is only possible in the case that there is an obvious urticaria and there may be ureteral reconstruction at the time of birth [7].

On the part of foetal surgery, a consensus is offered with the parents about the amniotic vesic derivations, however, it must be borne in mind that a large percentage of these foetuses suffering from abnormalities of the urinary tract that correspond to urethral atresia, are female foetuses that have associations with aneuploidies incompatible with life [8].

Discussion

A clinical understanding of the embryonic development of the bladder and urethra is essential for the correct interpretation of the anatomical ultrasound findings and the prenatal and postnatal outcomes that can define optimal follow-up and treatment. The nephrons begin to produce urine around the tenth week of pregnancy. This is when the first signs of abnormalities of the lower urinary tract may appear [1].

Between the fourth and sixth weeks of gestation, the urorectal rib divides the endodermal cloaca into a ventral urogenital sinus and a dorsal rectum. The cranial part of the urogenital sinus continues with the allantoides and develops in the bladder and pelvic urethra. The fluid portion leads to the phallic urethra in male foetuses and the distal vagina in female foetuses. Unlike men, the entire female urethra derives from the pelvic part of the urogenital sinus. The allantoid develops as an extraembryonic cavity from the vitelline bag and connects to the cranioventral portion of the cloaca, the future bladder. Around week 16 of gestation, the allantoid canal and the ventral cloaca involute as the bladder descends to the pelvis.

The first trimester ultrasound is a fundamental element of the screening policy, to this screening we can add additional invasive diagnostic tests when there are anatomical findings suggesting aneuploidies.

Ultrasound alone is often insufficient to allow a definitive diagnosis, although it may indicate that a specific diagnosis is more likely. In view of the evidence of a megabladder, the approach consists of karyotype/Array-CGH, detailed morphological ultrasound, including echocardiography, study of renal function, based mainly on the Eco graphical study and in selected cases in the study of foetal urine for vesicocentesis or foetal blood by cordocentesis. It should be considered especially as evaluation prior to foetal surgery, kidney injury and the amniotic fluid-related complications expected according to this and evolutionary control according to the etiological genetic counselling [9].

Conclusions

In the literary search there are few cases of abnormalities of the urinary tract in female foetuses that are of the etiological origin of urethral atresia. This is why this case report is of great use for the available reference framework, in addition to it constitutes an important contribution to continue the follow-up to these events and increase the opportunity of an in-uterus therapy based on the risks and prognosis already known.

Ethical Aspects

The patient signed the informed consent authorizing the investigators to publish the case.

Bibliography

1. Partin AW., *et al*. "Campbell Walsh Wein Urology, E-Book". *Elsevier Health Sciences* (2020): 518-527.e1.

2. McHugo J and Whittle M. "Enlarged fetal bladders: aetiology, management and outcome". *Prenatal Diagnosis* 21.11 (2001): 958-963.

3. Rosati P and Guariglia L. "Transvaginal sonographic assessment of the fetal urinary tract in early pregnancy". *Ultrasound in Obstetrics and Gynecology: The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology* 7.2 (1996): 95-100.

4. Hamdaoui N., *et al*. "Échographie de l'appareil urinaire fœtal au 1er trimestre de la grossesse [Ultrasound of the fetal urinary system during the first trimester of pregnancy]". *Gynecologie, Obstetrique, Fertilite and Senologie* 45.6 (2017): 373-380.

5. Abuhamad A and Chaoui R. "Diagnóstico por ultrasonido del primer trimestre de anomalías fetales". *Wolters Kluwer Heath* (2017): 339.

6. Lesieur E., *et al*. "Megacystis in the first trimester of pregnancy: Prognostic factors and perinatal outcomes". *PLoS One* 16.9 (2021): e0255890.

7. Cartwright PC., *et al*. "Vejiga y uretra. Holcomb y Ashcraft". *Cirugía pediátrica (Séptima edición)* (2021): 870-883.

8. Partin AW., *et al*. "Campbell Walsh Wein Urology, E-Book". *Elsevier Health Sciences* (2020): 602-623.e4.

9. Taghavi K., *et al*. "Fetal megacystis: A systematic review". *Journal of Pediatric Urology* 13.1 (2017): 7-15.