

Üç Boyutlu Ultrasonografinin Primer Megaureter Tanı ve Sunumundaki Yeri

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ÖZET:

Üreterlerin çapının 7mm'yi aşması megaureter olarak adlandırılır. Hastaların pek çoğunda prenatal anormal bulgu vardır ve üriner patoloji gelişebilecek fetüsleri ayırtetmek mümkündür. Üriner sistem enfeksiyonları, karın ağrısı, karında kitle ve hematüri antitenin görülen genel bulgularıdır. Magaureterin prenatal tanısı konvansiyonel iki boyutlu ultrasonografi kullanılması ile genellikle mümkündür. Ama bazı olgularda yakındaki sıvı içerikli barsaklar genişlemiş ureterleri maskeleyebilir ve yanlış tanımlara sebep olabilir. Bu durumlarda üç boyutlu ultrasonografi patolojinin aydınlatılmasında yardımcı olabilir. Bu yazıda bir primer megaureter olgusu sunuyoruz. Olguda üç boyutlu ultrasonografi kullanılarak kesin tanı konulabilmiştir.

Anahtar Kelimeler: Anormallikler Üç boyutlu görüntüleme, Prenatal tanı, ultrasonografi, prenatal, Ürogenital anomaliler, Ürolojik hastalıklar

ABSTRACT:

The role of the three-dimensional ultrasound in the diagnosis and presentation of the primary megaureter

Ureters more than 7 mm in diameter are called megaureters. Most of the patients have an abnormal finding on routine prenatal ultrasound and it is possible to identify the fetuses having the increased risk of developing urinary pathologies. Urinary tract infection, abdominal pain, abdominal mass, and hematuria are the general observed signs of the entity. The prenatal diagnosis of the primary megaureter is generally possible by using the conventional two-dimensional ultrasound. However, in some cases the nearby fluid filled intestines may obscure the dilated ureters and cause misdiagnosis. In this condition, three-dimensional ultrasound may help to clarify the pathology. In this report, we present a case of primary megaureter. We could have the final diagnosis by using the three dimensional ultrasound.

Key Words: Abnormalities; Three-Dimensional Image; Antenatal Diagnosis; Diagnosis, Ultrasonic Prenatal, Genitourinary Abnormalities, Urinary Tract Diseases.

INTRODUCTION

A wide ureter, greater than 7 mm in diameter is described as megaureter. Functional classification divides megaureters into four types as: obstructed, refluxing, obstructed and refluxing, and non-obstructed/ non-refluxing. Primary obstructed megaureters are bilateral in about 20% of the cases and have a male-to-female ratio of nearly 4:1. The left side is affected more often than the right side¹. Intravenous urography and ultrasonography are the diagnostic tools. In this report, we present a case of primary megaureter. We could have the final diagnosis by using the three dimensional ultrasound.

CASE

The parents gave informed consent to the work for publication after masking the identity of the fetus and the parents. A 22 year old, gravidity 3, parity 2, third trimester pregnant (36 weeks, 2 days due to last menstrual period) woman was referred to our tertiary centre from a secondary centre hospital, with the diagnosis of fetal renal calyceal dilatation. The medical history, physical examination, routine laboratory studies and the triple screening of the woman (except being married with her cousin) were non-specific. Up to the referral date there was not any pathological finding concerning the fetus, woman and her family. Ultrasound examination was performed by using a 3D/4D abdominal transducer (2-5 MHz,

GE Voluson 730Pro). Fetal biometric and amniotic fluid volume measurements were well matched with the gestational week. The placenta was localized on the anterior wall of the uterus. In fetal anatomic study, the central nervous, cardiovascular, gastrointestinal and skeletal systems were observed as normal. There was no adverse finding about the bio-physic profile. In fetal urinary system examination, we did not find any pathological finding in the left fetal kidney (with a 37x14mm of longitudinal and transverse distance, respectively), left ureter (with a diameter of 1,83mm), urinary bladder and the urethra. However, the right renal calyx was dilated with a measurement of 16 x 9.6 mm, in transverse section. The right kidney's longitudinal and transverse distance measurements were as 53x28 mm, respectively. The dilatation was continuous down to the uretero-vesical junction. The right ureteral dilatation was observed beginning from the junction to the renal pelvis with a diameter of 8,4mm. Two-dimensional ultrasound showed the renal calyceal dilatation (**Figure 1 and 2**).

Figure 1: Two-dimensional image of the obstruction of the right ureter at the urinary bladder insertion side.



Figure 2: Two-dimensional image of the dilatation of the right fetal ureter.



However the ureteral dilatation was difficult to identify because of the liquid containing image of the fetal intestines. The insertion side of the right ureter into the fetal urinary bladder was easily identified by using the three / four dimensional ultrasound view. In addition, the diameter of the dilated ureter was measured by using the image created by the three dimensional scanning modality (**Figure 3**).

Figure 3 : Three-dimensional image of the dilated right ureter.



The normal left ureter and its insertion into the fetal urinary bladder was also demonstrated by using the three / four dimensional ultrasound (**Figure 4**).

Figure 4: three-dimensional image the normal left ureter.



Serious ultrasonography follow up was planned. The renal calyceal and ureteral dilatation were followed until the delivery of the fetus. The dilatation did not progress and the woman delivered at 38th week of the pregnancy by the vaginal route. Postnatal follow of the neonate showed no progression of the megaureter and hydroureteronephrosis. The baby was set in to a follow up schedule by the urologist and the pediatrician.

DISCUSSION

Most commonly, an adynamic juxtavesical segment that fails to propagate urine flow effectively causes primary obstructed megaureter. Interposition of the collagen rich fibrous tissue between the muscle cells of the juxtavesical segment of the ureter and the change of the nervous tissue seem to be the reason of the adynamia.²⁻⁴ Vesico-ureteral junction incompetence allows reflux through an adynamic segment causing primary refluxing obstructed megaureter. Generally, the clinical signs are non-specific. Most of the patients have an abnormal finding on routine prenatal ultrasound and it is possible to identify the fetuses having the increased risk of developing urinary pathologies. Urinary tract infection, abdominal pain, abdominal mass, and hematuria are the general observed signs of the entity.

For differential diagnosis, urinary tract ultrasound, voiding cystourethrography, urography, serial diuretic renography and pressure-perfusion studies may be used⁵. In some patients, the diagnosis is incidental following the imaging studies for unrelated symptoms.

The two-dimensional ultrasound is the most widely used diagnostic tool⁶ for the prenatal diagnosis of the urinary tract abnormalities. However the urinary tract extends through multiple scan planes and this feature prevents its display in one slice. In contrary, the three-dimensional imaging technology can display the fluid-containing fetal structures in a single image as in the imaging of the entire urinary collecting system showing the dilatation of the kidney pelvis, calyces and the hydroureter down to the bladder. The multiple slice scanning ability of the three-

dimensional imaging modality facilitates observation of the multiple anomalies concurrently^{7, 8}. In addition, the use of inversion mode and virtual organ computer-aided analysis (VOCAL) mode enables a contiguous and more realistic imaging of the fluid-containing structures^{8, 9}. VOCAL also provides more accurate volumetric measurements. Nevertheless, three / four dimensional ultrasound may reduce imaging time, improve image detail and demonstrate the anatomic/pathologic distinction more accurately. A comprehensive demonstration of the dilatations similar to intravenous urography and magnetic resonance urography images can be achieved by using the rendered views dilatations¹⁰. In our case, although we used the surface imaging mode, the improved anatomical detail observed in the three-dimensional image provided the final diagnosis and the multi-slice scans of the dilated and normal ureters, and their insertion sites to the urinary bladder were demonstrated in a single image by using the three-dimensional imaging modality. Management of the megaureter depends on the severity of the condition and renal functional impairment¹¹⁻¹⁵. Primary non-refluxing megaureters diagnosed antenatally, generally resolve spontaneously¹⁶. In addition the long-term follow up of mild to moderate cases have good prognosis¹⁷. Intrauterine invasive management may be a choice for the fetuses with advancing renal impairment but the procedure should be performed before the irreversible kidney failure. Cases with oligohydramnios have poor prognosis because of the advanced renal damage⁹.

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