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Antenatal Diagnosis of Megaureter: A Comprehensive Case Report and Literature Review

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Abstract **Case Report**

Introduction: Megaureter, a congenital dilation of the ureter, is frequently detected during antenatal ultrasound and may be primary or secondary. Accurate diagnosis and management are crucial to prevent complications and identify associated anomalies. ***Case Presentation:*** A 28-year-old primigravida's fetus was diagnosed with unilateral megaureter at 20 weeks' gestation, with a ureteral diameter of 8 mm and mild hydronephrosis. Serial ultrasounds confirmed stable findings, and postnatal follow-up showed spontaneous resolution. ***Results:*** Conservative antenatal management with multidisciplinary consultation resulted in favorable outcomes without surgical intervention. ***Conclusion:*** This case underscores the role of ultrasound in diagnosing megaureter and the efficacy of conservative management in uncomplicated cases, emphasizing the need to rule out chromosomal anomalies like trisomy 13.

Keywords: Megaureter, antenatal ultrasound, hydronephrosis, congenital uropathy, trisomy 13, conservative management.

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1. INTRODUCTION

Megaureter, characterized by a dilated ureter, is one of the most common congenital anomalies of the urinary tract, with an incidence of approximately 1 in 1500 pregnancies [1]. It is classified as primary, due to intrinsic ureteral abnormalities such as aperistaltic distal segments or adynamic ureterovesical junctions, or secondary, resulting from conditions like vesicoureteral reflux (VUR), posterior urethral valves, or neurogenic bladder [2]. Antenatal ultrasound is the primary diagnostic tool, with a ureteral diameter exceeding 7 mm in the second trimester considered diagnostic [3]. Megaureter is significant not only for its potential to cause hydronephrosis and renal impairment but also for its association with other congenital anomalies, including chromosomal disorders like trisomy 13, which presents urinary tract abnormalities in 30–50% of cases [4].

The pathophysiology of primary megaureter involves defective ureteral peristalsis, leading to functional obstruction and dilation, while secondary megaureter reflects downstream obstruction or reflux [2]. Antenatal detection allows for early risk stratification, guiding decisions on monitoring, intervention, or genetic testing. The clinical challenge lies in distinguishing isolated megaureter from cases with associated anomalies, as the latter may require more aggressive management [5]. This case report details the antenatal diagnosis, management, and postnatal outcome of a fetus with unilateral megaureter, highlighting ultrasound findings, differential diagnosis, and the role of conservative management.

2. CASE PRESENTATION

A 28-year-old primigravida with no significant medical history presented for a routine second-trimester ultrasound at 20 weeks' gestation. The ultrasound revealed a unilateral left megaureter, with a ureteral diameter of 8 mm and mild pelvicalyceal dilation (anteroposterior renal pelvis diameter of 5 mm). The bladder appeared normal, with no evidence of thickening or keyhole sign suggestive of posterior urethral valves. Amniotic fluid volume was within normal limits (amniotic fluid index: 12 cm), and no other structural anomalies were identified. The findings were consistent with a primary megaureter, likely due to an aperistaltic distal ureteral segment.

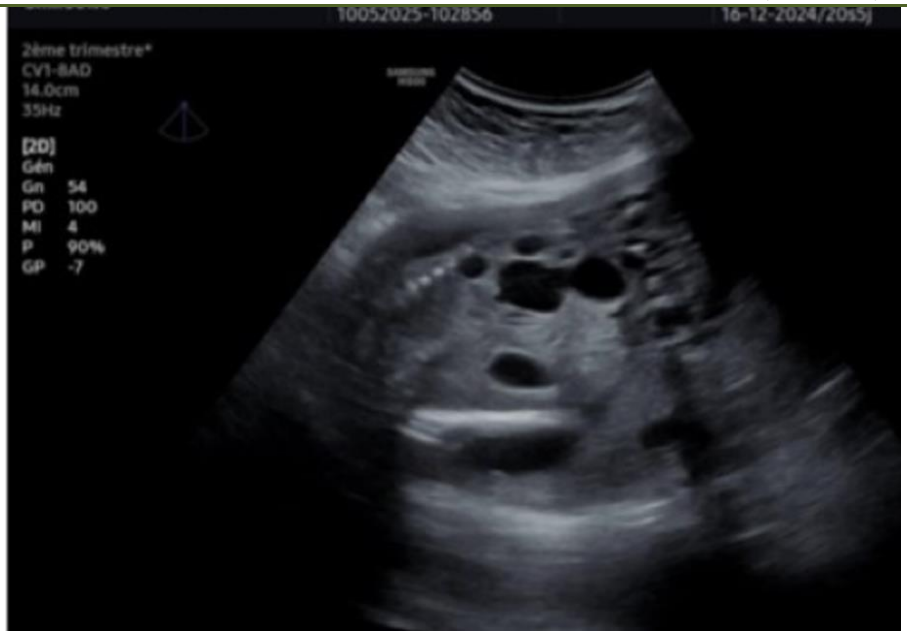

Figure 1: Transverse ultrasound at 20 weeks showing left megaureter (8 mm diameter) with mild pelvicalyceal dilation

Serial ultrasounds were performed at 24, 28, and 32 weeks to monitor progression. At 24 weeks, the ureteral diameter remained stable at 8 mm, with mild hydronephrosis (renal pelvis diameter: 6 mm). By 28 weeks, the ureter measured 9 mm, with no significant increase in hydronephrosis. The 32-week ultrasound showed no progression (ureter: 9 mm, renal pelvis: 6 mm) and normal amniotic fluid. The right kidney and ureter were normal throughout gestation. Genetic counseling was offered to evaluate for trisomy 13 or other chromosomal anomalies, given the known association with urinary tract abnormalities. Amniocentesis was declined, as no additional ultrasound markers (e.g., holoprosencephaly, polydactyly, or cardiac defects) were present.

The patient was managed conservatively with input from maternalfetal medicine, pediatric urology, and neonatology. Delivery occurred at 39 weeks via spontaneous vaginal delivery, resulting in a healthy male infant (birth weight: 3.2 kg). Postnatal ultrasound at 1 week of age showed a reduced ureteral diameter (5 mm) and resolution of hydronephrosis. Follow-up ultrasounds at 3 and 6 months confirmed complete resolution of the megaureter, with normal renal function and no urinary tract infections. The infant remained asymptomatic, and no surgical intervention was required.

3. DISCUSSION

Megaureter is a critical antenatal finding due to its potential to cause renal damage and its association with other congenital anomalies. Primary megaureter results from intrinsic ureteral defects, such as aperistaltic segments or abnormal ureterovesical junctions, leading to functional obstruction and dilation [2]. Secondary megaureter, conversely, is caused by conditions like VUR, posterior urethral valves, or extrinsic compression (e.g., by a pelvic mass) [3]. In this case, the absence of bladder abnormalities or bilateral involvement supported a diagnosis of primary megaureter, consistent with ultrasound findings of a unilateral dilated ureter and mild hydronephrosis.

Ultrasound is the cornerstone of antenatal diagnosis, with a ureteral diameter greater than 7 mm in the second trimester considered diagnostic [3]. Additional findings, such as hydronephrosis, bladder wall thickening, or oligohydramnios, help differentiate primary from secondary causes [5]. In this case, serial ultrasounds demonstrated stable ureteral dilation (8–9 mm) and mild hydronephrosis, with normal amniotic fluid, suggesting a low risk of significant obstruction. The use of multiple ultrasound views (transverse and sagittal, as depicted in to) was critical in confirming the diagnosis and ruling out associated anomalies.

The association of megaureter with chromosomal anomalies, particularly trisomy 13, necessitates thorough evaluation. Trisomy 13, also known as Patau syndrome, is characterized by severe congenital anomalies, including urinary tract abnormalities in 30–50% of cases [4]. Common findings include renal agenesis, cystic dysplasia, and megaureter. In this case, the absence of additional ultrasound markers (e.g., holoprosencephaly, polydactyly, or facial clefts, as shown in ultrasound) reduced the likelihood of trisomy 13, though genetic testing was declined. Clinicians should consider offering amniocentesis or cell-free fetal DNA testing in cases of megaureter with other anomalies to guide prognosis and management [6].

Antenatal management of megaureter focuses on serial ultrasound monitoring to assess progression,

amniotic fluid volume, and associated anomalies [5]. In uncomplicated cases, as seen here, conservative management is preferred, with many cases resolving spontaneously postnatally [7]. Studies report that 70–80% of primary megaureters resolve without intervention by 2 years of age, attributed to maturation of ureteral peristalsis [7]. However, controversies exist regarding the threshold for intervention. Some advocate early surgical correction in cases with severe hydronephrosis or renal function impairment, while others emphasize watchful waiting [8]. In this case, the stable ultrasound findings and normal postnatal outcomes supported a conservative approach.

Postnatal management involves ultrasound surveillance, renal function assessment, and monitoring for complications like urinary tract infections or obstruction [9]. The rapid resolution of megaureter in this case (within 6 months) is consistent with the favorable prognosis of primary megaureter. Surgical options, such as ureteral reimplantation or endoscopic dilation, are reserved for cases with progressive hydronephrosis, recurrent infections, or renal impairment [8]. The role of prophylactic antibiotics remains debated, with some studies suggesting no benefit in low-risk cases [10].

This case highlights several key points. First, accurate ultrasound characterization is essential for distinguishing primary from secondary megaureter and guiding management. Second, the absence of associated anomalies reduces the likelihood of chromosomal disorders, though genetic counseling should be offered. Finally, conservative management with multidisciplinary input is effective in uncomplicated cases, avoiding unnecessary interventions. Future research should focus on refining ultrasound criteria for intervention and optimizing postnatal follow-up protocols.

4. CONCLUSION

This case report describes the successful antenatal diagnosis and management of unilateral megaureter in a fetus at 20 weeks' gestation. Key elements included precise ultrasound evaluation, serial monitoring, and multidisciplinary collaboration, leading to spontaneous postnatal resolution without complications. The case underscores the importance of distinguishing primary from secondary megaureter, ruling out associated anomalies like trisomy 13, and adopting a conservative approach in uncomplicated cases. Clinicians should leverage ultrasound as the primary diagnostic tool and maintain vigilance for chromosomal or structural abnormalities. Future studies are needed to standardize management protocols and identify predictors of spontaneous resolution.

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