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Ureteropelvic Junction Obstruction Presented Antenatally as a Large Intra-Abdominal Cyst

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Abstract **Background:** Cases of large intra-abdominal cyst in fetus are rare and determination of its origin is challenging. A multidisciplinary approach is recommended. **Case Presentation:** A large intra-abdominal cystic mass was found in a 28 weeks fetus during routine ante-natal scan. The baby was born via a scheduled cesarean section and initial physical examination revealed a distended abdomen. Ultrasonography of abdomen showed a large cystic mass in which the origin was undetermined. Hence, contrast enhanced computed tomography abdomen was performed, revealed grossly dilated pelvicalyceal system due to congenital ureteropelvic junction (UPJ) obstruction. The baby underwent right open dismembered pyeloplasty at days 27 of life. Post-operative period was uneventful and serial renal function test showed no renal impairment. Baby was discharged home after 40 days of operation. **Conclusion:** UPJ obstruction can present antenatally as a large cystic mass and multidisciplinary team involvement should be considered to determine the pre-natal and post-natal management. These include an appropriate delivery plan including method and place of delivery.

Keywords: *ureteropelvic junction obstruction, large intraabdominal cystic mass, hydronephrosis*

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1. Introduction

Cases of large intra-abdominal cyst in fetus are rare and determination of its origin antenatally is challenging. On the other hand, cases of ureteropelvic junction (UPJ) obstruction is common in pediatric urology and one of the most common cause of antenatal hydronephrosis [1]. However, if large enough, congenital hydronephrosis in fetus may appear as a cystic mass noted during ante-natal ultrasound examination.

We reported a case of gross hydronephrosis caused by congenital UPJ obstruction detected antenatally as a large intra-abdominal cystic mass during ante-natal scan.

2. Case Presentation

A large intra-abdominal cystic mass was found in a 28 weeks old fetus during routine antenatal scan. The documented size was 9.89cm x 9.26cm. The baby was born at 38 weeks via a scheduled cesarean section with no acute complication. Initial physical examination revealed a distended abdomen.

Plain radiograph showed homogenous opacity extending from right hypochondriac region till right parapelvis with displacement of bowels towards left side (Figure 1). Ultrasonography of abdomen showed a large cystic mass in which the origin was undetermined. Hence, contrast enhanced computed tomography (CECT) abdomen was performed, revealed non-visualization of right kidney with a huge cystic mass in the right renal fossae suggestive of grossly dilated pelvicalyceal system due to congenital UPJ obstruction (Figure 2). Urine output and renal profile was normal. The child was managed in neonatal intensive care unit (NICU) with close monitoring of urine output and renal profile.

Based on the grade 4 dilatation as defined by Society of Fetal Ultrasound (SFU) the baby underwent right open dismembered pyeloplasty at days 27 of life. Intraoperatively there were grossly dilated right renal pelvis with transition zone at UPJ and small narrowing of the rest of right ureter. The redundant parts of renal pelvis including the stenosis part of proximal ureter were excised and remaining ends were anastomosed. Right nephrostomy tube was inserted.

Post-operative period was uneventful. Right antegrade pyelogram (APG) at two weeks post operation showed no leakage of anastomotic site. The nephrostomy tube was then removed after 3 weeks post operation. Serial renal function test showed no renal impairment. Baby was discharge home after 40 days of operation. Diuretic renography using 99mTc-MAG3 was done at two month old showed non-functioning right kidney. Left kidney had good function with no urinary outflow obstruction.

Clinically the child's health was progressing well and renal function tests remain within normal range during follow-up.

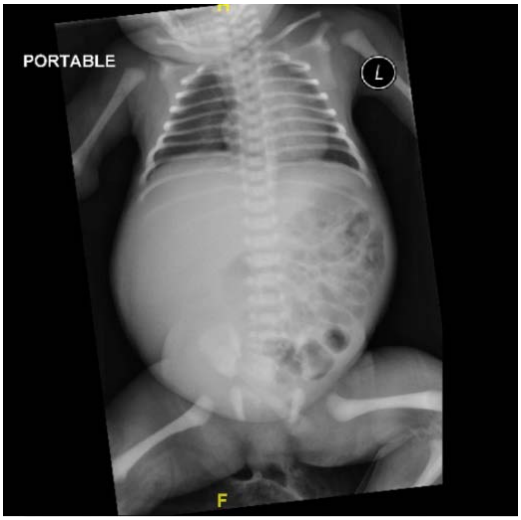

Figure 1. Plain radiograph showed homogenous opacity extending from right hypochondriac region till right parapelvis with displacement of bowels towards left side

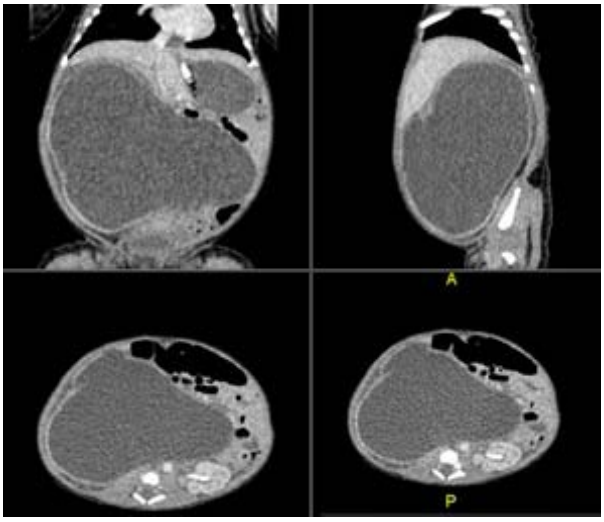

Figure 2. Contrast enhanced computed tomography of abdomen revealed a large cystic mass with non-visualization of right kidney

3. Discussion

Cases of large intra-abdominal cyst in fetus are rare. The cyst may originate from either gastrointestinal tract or genitourinary tract and it is difficult to accurately determine the origin during antenatal ultrasound. An appropriate antenatal ultrasound assessment based on localization and ultrasound characteristic is essential to ensure better accuracy in determining the origin [2]. There is female preponderance with ovarian cysts being the most frequent origin for intra-abdominal cysts [3]. Other types of fetal intra-abdominal cysts are gastrointestinal duplication cyst, mesenteric cyst, multicystic dysplastic kidney, choledochal cyst and various other types. The cysts can resolved spontaneously or persist, requiring close prenatal surveillance.

Large hydronephrosis is another condition that may appear as cystic lesion during antental ultrasound examination. UPJ obstruction is the most common cause of antenatal hydronephrosis with estimated incidence of 1 in 750-1500 live births [4]. UPJ obstruction is a blockage of urine flow from the kidney into the proximal upper ureter. Urine will accumulate in the renal pelvis and calyces leading to hydronephrosis and subsequently damage to the renal parenchyma [5]. As in our case, the large cystic lesion noted antenatally was actually a grade 4 antenatal hydronephrosis based on SFU grading system.

Nowadays routine antenatal ultrasound examination has allowed most hydronephrosis detected at 18-20 weeks of pregnancy [4]. However, as in our case, an enormously dilated renal pelvis may appear as a large cystic lesion in antenatal ultrasound, giving dilemma in determining its origin. Multidisciplinary team involvement such as obstetrician, pediatric surgeons and neonatologist should be considered to determine the prenatal and post-natal management. A scheduled cesarean section should also be considered, anticipating risk of difficulty in labor.

After birth, a thorough physical examination should be performed to detect any associated dysmorphic features. An accurate post-natal diagnosis is essential to determine the choice of treatment and anticipate disease outcome. Hence, appropriate post-natal imaging should be done to reach the diagnosis. As in our case, the diagnosis was confirmed after contrasted enhanced CT scan showed absent of right kidney with a large cystic lesion that suggestive of grossly dilated pelvicalyceal system due to UPJ obstruction.

The urinary dilatation in our case was a grade 4 as defined by the SFU and considering the high success rate, open dismembered pyeloplasty was performed. The success rate of open pyeloplasty described in literatures is >95% and the procedure has been considered as the gold standard for the treatment of UPJ obstruction [4]. Diuretic renography done at two months after the surgery showed non-functioning right kidney, probably because it was done quite early. The scan should be repeated at one year.

4. Conclusion

We recommend that, although rare, the possibility of large hydronephrosis should be considered in the list of differential diagnosis of large intra-abdominal cyst detected during antenatal ultrasonography. Multidisciplinary team involvement should be considered to determine the prenatal and post-natal management. These include an appropriate delivery plan including method of delivery that is safe for both mother and baby, and place of delivery where the required expertise for post-natal management is available.

5. Declaration

There is absence of conflict of interest in every part of this case report as well as towards the medical device and pharmaceutical company.

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