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Case Report

An Interesting Neonatal Abdominal Mass

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ABSTRACT

We present the case of a neonate who was born with an antenatal ultrasound diagnosis of a cystic abdominal mass of uncertain origin. The diagnosis of pelviureteric junction obstruction (PUJO) was obscured by difficulty determining the origin of the extremely large cystic abdominal mass. Sonographically, the kidneys appeared relatively normal, creating a diagnostic dilemma – the hydronephrosis was almost exclusively in an extrarenal pelvis. Additionally, contralateral hydronephrosis secondary to the mass effect further confused the diagnosis. We discuss the differential diagnosis of neonatal cystic abdominal masses and review the literature of giant hydronephrosis.

Key Words: Abdominal mass, neonate, diagnosis, ultrasonography, ureteropelvic junction obstruction

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CASE REPORT

A male neonate was born with an antenatal ultrasound diagnosis of a cystic abdominal mass of uncertain origin. Postnatal examination revealed a large palpable abdominal mass. The renal function was normal. Ultrasound demonstrated a large cystic mass not typical of pelviureteric junction obstruction (PUJO). Additionally, bilateral mild hydronephrosis and a normal bladder were shown. The ultrasound was unable to indicate from which kidney the suspected hydronephrosis originated (Fig. 1).

A micturating cystourethrogram revealed grade III vesico-ureteric reflux (VUR) into the left kidney with lateral displacement of the left ureter and superior displacement of the left kidney (Fig. 2).

A Technetium Tc99m mercaptoacetyltriglycine (MAG3) radionuclide renogram showed decreased uptake from the right kidney (24%) with persistence of activity in the collecting system, but a good response to furosemide. The left kidney was normal. These findings appeared to support a diagnosis of a right PUJO (Fig. 3). However, it was not clear whether the obstructed right renogram was due to PUJO or secondary to the (potentially extrinsic) mass. Magnetic resonance urography (MRU) was requested to better define the anatomy (Fig. 4). Despite the MRU showing a 90 mm x 70 mm cystic mass, its origin could still not be established with certainty.

The infant remained well and was taken to theater at three months of age. A retrograde pyelogram demonstrated a markedly deviated right ureter with dilute contrast draining into the now confirmed massively dilated right renal pelvis (Fig. 5).

Surgical exploration through a subcostal incision revealed a massive PUJO; The right

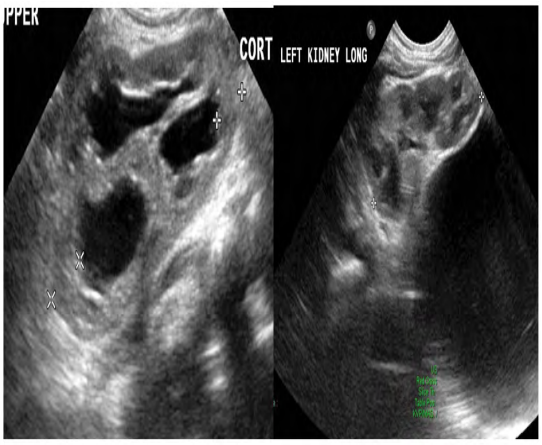

Fig. 1: Moderate hydronephrosis of the right kidney (left) and left kidney with adjacent massive cystic abdominal mass (right).

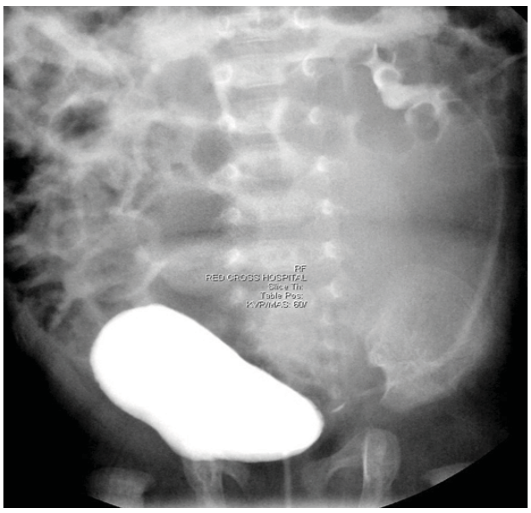

Fig. 2: Micturating cystourethrogram demonstrating Grade 3 vesico-ureteric reflux into the left kidney with displacement by the cystic mass of the bladder, left ureter and kidney.

renal pelvis was noted to extend across the midline to displace the left ureter laterally, and 350 ml of urine was drained from the right renal pelvis (Fig. 6). Despite the massive size of the pelvis, the right kidney was only moderately hydronephrotic with relatively preserved renal cortex.

A dismembered Anderson-Hynes pyeloplasty was performed. No transanastomotic stent or nephrostomy tube was inserted. A perinephric drain was placed and the infant had an uncomplicated recovery. Postoperative ultrasound performed at 6 weeks revealed

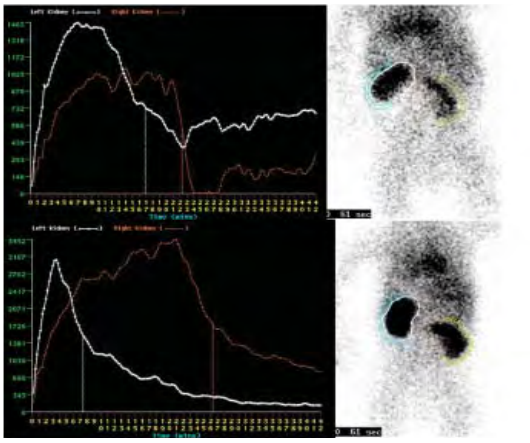

Fig. 3: Diuretic MAG3 renogram, pre-operative (above) and post-operative (below).

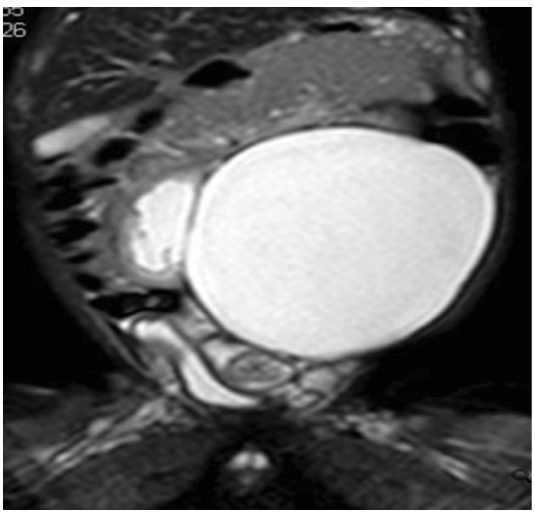

Fig. 4: Magnetic resonance urography demonstrated a right hydronephrotic kidney and a large cystic abdominal mass (90mm x 70mm). However, the origin of the mass could not be established with certainty as a right PUJ obstruction or an extrinsic mass causing secondary hydronephrosis.

an antero-posterior (AP) pelvis reduction to 10 mm (Fig. 7). MAG3 renography showed stable differential function of the right kidney - 26% post-operatively versus 24% pre-operatively (Fig. 3).

DISCUSSION

PUJO is the commonest cause of hydronephrosis in the neonatal period and is also the commonest cause of a palpable abdominal mass in a child[1]. The case presented

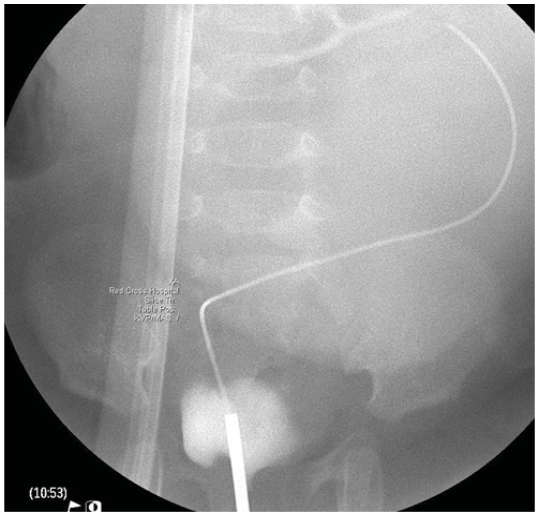

Fig. 5: Intraoperative retrograde pyelogram revealed a markedly deviated right ureter with contrast draining into the large cystic mass, thus confirming right PUJ obstruction.

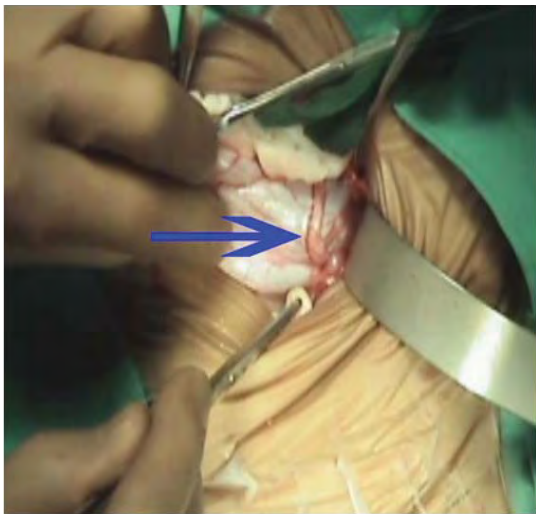

Fig. 6: Left ureter (blue arrow) coursing over massive extrarenal pelvis of the right PUJ.

here is unique in two respects. Firstly, the massive degree of hydronephrosis confused the routine evaluation of an antenatally diagnosed hydronephrosis. The exact origin of the "cystic mass" could not be confirmed sonographically or by MRU. The origin was further obscured by its extension across the midline to cause hydronephrosis as well as lateral and superior displacement of the contralateral kidney.

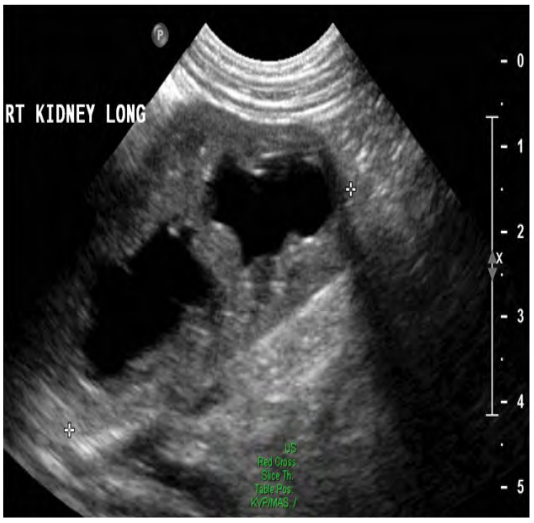

Fig. 7: Post-operative ultrasound showing mild residual hydronephrosis and an AP pelvis of 10 mm.

Secondly, the pathophysiology of giant hydronephrosis in adults is typically longstanding PUJO that over time causes progressive dilatation and a non-functioning kidney. Here the presentation was very early in life with only minimal intrarenal dilatation and reduced function. The hydronephrosis was localized to the extrarenal pelvis. Giant hydronephrosis in adults has been defined as a kidney containing greater than 1L of fluid[2]. The literature has isolated case reports of giant hydronephrosis. In two such adult cases greater than 10L of fluid was drained[3].

The rarity of this degree of hydronephrosis in infants is supported by the experience from Great Ormond Street Children's Hospital. In their review of nearly 1000 cases of antenatally detected hydronephrosis, those requiring surgery had a mean pre-operative pelvic diameter of 25 mm, with 55 mm being the largest measurement recorded[4].

Neonatal abdominal masses originate from a broad spectrum of anomalies. Congenital disorders of the urinary tract account for the majority of these abdominal masses. Hydronephrosis and multicystic dyplastic kidney (MCDK) are the commonest of these renal causes[1]. The non-urological differential diagnosis of an intra-abdominal cystic lesion in the newborn would include hydrocolpos, ovarian cysts, enteric duplication cysts, mesenteric cysts and choledochal cysts.

Neonatal abdominal masses may be detected during routine antenatal ultrasound. Postnatally, the origin of the mass can rarely be determined by presentation or examination alone. Ultrasound is the recommended initial imaging examination. It can determine the organ of origin of the mass and establish if it is solid or cystic.

With regard to renal masses, hydronephrosis can be differentiated from MCDK by the latter having cysts that do not communicate. The level of obstruction can usually be accurately determined, for example PUJO can usually be diagnosed correctly[1,5].

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