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Introduction

Giant hydronephrosis is rare and is diagnosed when the volume of the collecting system exceeds 2–4% of body weight [10]. The most common cause is ureteropelvic junction obstruction (UPJ O). Nephrectomy is considered if the function of the affected kidney is less than 10%, and the other kidney is normal [8]. The gold standard for repair is the Anderson-Hynes pyeloplasty [1]. However, the results of this technique alone are not always optimal for giant hydronephrosis, often making it difficult to salvage the affected kidney over the long term. Therefore the standard technique was modified by performing plication of the renal calyces as an adjunct to dismembered pyeloplasty [13]. This is the first case of giant hydronephrosis of a single kidney in a child treated by Anderson-Hynes pyeloplasty modified with calyceal plication.

Case Report

A 7-year-old boy presented with distended abdomen but without other complaints. Initial laboratory findings, urinalysis and urine culture were normal. A plain abdominal radiograph delineated a soft tissue shadow that occupied the right and a part of the left hemi-abdomen and pelvis, dislocating the loops of the small and large intestine in the most lateral left hemi-abdomen. Ultrasound (US) detected a giant cystic right kidney measuring 224 mm with a pyelon width of 129 mm and particular calyces of up to 42 mm. The left kidney was not found. An excretory urography demonstrated an extremely large cystic formation that occupied the right hemi-abdomen without visualisation of the contralateral kidney. Voiding cystourethrogram was normal.

Calyceal Plication with Anderson-Hynes Pyeloplasty in a 7-Year-Old Boy with Giant Hydronephrosis of a Single Right Kidney
Preoperative 99mTc-DMSA scan showed a reduction in the lower pole with extreme pyelocalyceal dilatation in the middle part with resulting discontinuity of renal parenchyma. 99mTc-DTPA scan showed a radioisotope transit time through the right renal parenchyma of 18.20 min; 10.02 min through the pelvis and 28.22 min through the entire kidney. The left kidney was not visualised on both scintiscans. Furosemide administration did not result in the elimination of renal activity which appeared to indicate a mechanical obstruction of the renal collecting system. Retrograde urogram showed the catheter crossing the midline to the left with subsequent filling of a cystic space that occupied the right hemi-abdomen crossing the midline (Fig. 1). After the procedure the boy developed urosepsis and broad spectrum antibiotics were administered. A Cystofix suprapubic bladder catheter was introduced percutaneously on an emergent basis, initially draining 3000 ml of urine. Antibiotics were changed according to the antibiogram. After 10 days laboratory findings and urine culture were normal; urography through the Cystofix showed significant regression of dilatation but the large hydronephrosis was still present. The dilemma was deciding on the optimal treatment in this situation, and percutaneous drainage was instituted over several months. The position of the percutaneous drainage catheter was checked 1–2 times per month with additional laboratory and urine examinations. Uroprophylaxis consisted of trimetoprim-sulphamethoxa- sol for 14 days and nitrofurantoin for 14 days, alternately. Ambulatory abdominal US showed a significant reduction of giant hydronephrotic kidney. After 9 months the boy was hospitalised and an excretion urography was performed after Cystofix occlusion. Significant reduction of the hydronephrosis led us to consider an operative intervention. At operation a UPJO was found and an Anderson-Hynes pyeloplasty was carried out with calyceal plication of the diluted calyces. On the 12th postoperative day after ureteral stent extraction, antegrade urography through a T-drain showed normal contrast passage through the pyeloureteric junction, ureter and vesicoureteric junction. After 3 months the patient was symptomless, with normal laboratory findings, urinalysis and urine culture. Excretory urography showed the excretion of concentrated contrast within 20 min, with atypical contours of the collecting system consisting of elongated but narrowed calyces (Fig. 2). The ureteropelvic junction was normal with a rapidly filling, non-dilated ureter and urinary bladder. US showed a right kidney with a length of 114 mm and an uneven width of the renal parenchyma: along calyces it measured 10–16 mm and in between calyces up to 26 mm. Postoperative 99mTc-DTPA scan showed no signs of obstruction in the elimination curve with a significantly faster transit time: 5.12 min through the renal parenchyma (3.04 min through the pelvis and 8.16 min through the entire kidney). The patient remains asymptomatic 12 years postoperatively. Follow-up US examinations demonstrated nearly complete disappearance of the preoperative hydronephrosis.

**Discussion**

Giant hydronephrosis is defined as the presence of more than 1000 ml of fluid in the collecting system of the kidney or when the volume of the collecting system exceeds 2–4% of body weight [11, 12]. UPJO is the commonest cause (80%) of giant hydronephrosis in children [2, 7, 10]. The incidence of nephrectomy for giant hydronephrosis is, with wide variations, between 3 and 70% [3, 4, 6, 11]. Pyeloplasty in patients with UPJO significantly improves function compared to conservatively treated patients [9]. Several operative techniques are performed in addition to the Anderson-Hynes pyeloplasty to improve renal function. As it is a rare pathology, only a small series of patients undergo these procedures, making a comparison of the techniques difficult. Kato et al. [5] in a series of 6 patients after Anderson-Hynes pyeloplasty found significantly improved renal function and in 3 patients “nephroplication” was added. One modification (calyceal plication with pyeloplasty) made by Zupancic et al. [13] resulted in a significant renal functional improvement in 10 cases of giant hydronephrosis without the need for nephrectomy. This was especially valuable in this patient with giant hydronephrosis of a single kidney, in whom nephrectomy would have inevitably led to dialysis and subsequent renal transplantation.

**Conflict of Interest:** None

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