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Anuria and Hydronephrosis due to Ureteropelvic Junction Obstruction: A Case Report

Elham Emami[1*], **Samane Safari**[2]

[1]Assistant Professor, Department of Pediatrics, Shahrekord University of Medical Sciences, Shahrekord, Iran.
[2]Clinical Research Development Unit, Hajar Hospital, Shahrekord University of Medical Sciences, Shahrekord, Iran.

[*]**Corresponding Author**
Dr. Elham Emami,
Email: Emami.e@skums.ac.ir

Abstract
A 3-year-old boy presented with abdominal pain and distension, lower extremities and facial edema, and anuria for several days that was associated with ureteropelvic junction obstruction (UPJO). Initial ultrasonography showed the presence of a massive bilateral hydronephrosis with UPJO and a computerized tomography (CT) scan without contrast revealed a massive hydronephrosis and hydroureter (grade 3). A follow-up study, after relief of ureteral obstruction, showed the reversal of this pattern. Blood biochemical tests revealed a severe acidosis, hyperkalemia, and a BUN/Cr ratio of more than 20. The patient underwent emergency nephrostomy. The general condition of the patient improved. Abdominal distention reduced, levels of urea and creatinine decreased, and acidosis resolved. A CT scan revealed an almost complete disappearance of the hydronephrosis and a normal ureter. Ureteropelvic junction obstruction (UPJO) was established as the cause of giant hydronephrosis.

Keywords: Ureteropelvic Junction Obstruction; Anuria; Hydronephrosis.

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Introduction
Ureteropelvic junction obstruction (UPJO) is a congenital narrowing or occlusion where the ureter meets the kidney. In most cases the diagnosis is made antenataly and resolves spontaneously (1-2). Postnatal diagnosis is made when symptoms of abdominal pain, urinary tract infection (UTI), or hypertension or anuria occur (3-5). Hydronephrosis is defined as distention of the renal calyces and pelvis with urine as a result of obstruction of the outflow of urine distal to the renal pelvis. Analogously, hydroureter is defined as a dilation of the ureter (6). The presence of hydronephrosis or hydroureter can be physiologic or pathologic. It may be acute or chronic, unilateral or bilateral or in asymptomatic children during ultrasound investigation for other reasons. We report a child that was admitted in our hospital with anuria and abdominal pain that his impression was UPJO that was underwent nephrostomy emergently.

Case report
A 3-year-old boy was admitted to our hospital with complaints of abdominal pain and distension and lower extremities and facial edema as well as anuria for several days. On physical examination, blood pressure was 110/85, temperature was 37˚C, and the respiratory rate was 17/min. There was evidence of ascites and abdominal distention with no tenderness.
The results of lab tests were as follows: BUN=139 mg/d, Cr=5.3 mg/dl, hemoglobin=9.7 g/dl, hematocrit=29.5%, K=6.3, and Na=136. The results of venous blood gas analysis was PH=7.16, PCo2=20.5, and HCo3=7.4. Urine analysis revealed a red blood cell count of 28-30/high power field (HPF), a white blood cell count of 2-4/HPF, blood count of 3+ /HPF, and a protein count 1+/HPF. Blood sugar, serum phosphate, serum calcium,

serum amylase, and liver function tests were all within normal limits.

Ultrasonography revealed the presence of a massive hydronephrotic left kidney with UPJO view and small rim around. The right kidney had a decreased parenchymal echo (probably nonfunctional due to long-term obstruction and thinning cortex appeared with massive hydronephrosis. NO cystic lesion found in either sides.

A computerized tomography (CT) scan without contrast (Figure 1) revealed a massive hydronephrotic (grade 3) right kidney and a hydronephrotic sac with signs of prolonged bilateral UPJO stenosis. Further imaging (Figure 2) showed no evidence of radiotracer movement upward to the renal pelvis bilaterally indicating lack of VUR.

Due to prerenal azotemia (a BUN/Cr ratio of more than 20 and metabolic acidosis) and dehydration, 20cc/kg normal saline was infused two times, which corrected metabolic acidosis before surgery.

Hypertension responded well to labetalol treatment upon arrival.

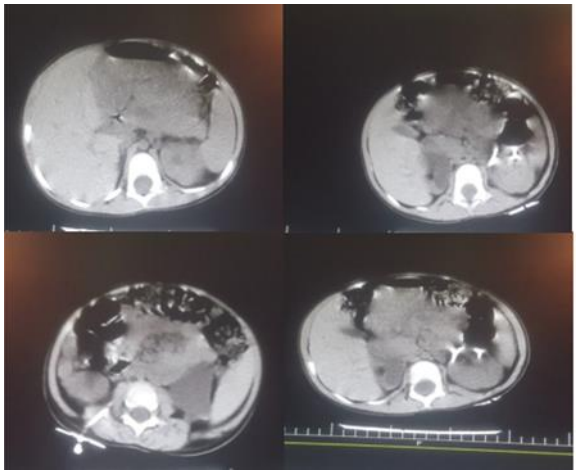

Figure 1. Computerized tomography scan without contrast of the patient which shows a massive hydronephrotic right kidney and a hydronephrotic sac with signs of prolonged bilateral UPJO stenosis.

Due to ascites, edema, and pleural effusion and lack of urinary drainage despite urinary catheterization and considering hyperkalemia, acidosis, and a high BUN/Cr ratio, an emergency urologic consultation was requested and emergency nephrostomy was done. The patient underwent emergency nephrostomy. An 8 French catheter passed up the left pelvis and a rapid drip of urine was obtained (indicating that anuria could be attributed to the stone) resulting in polyuria, which was treated with half-saline serum without potassium.

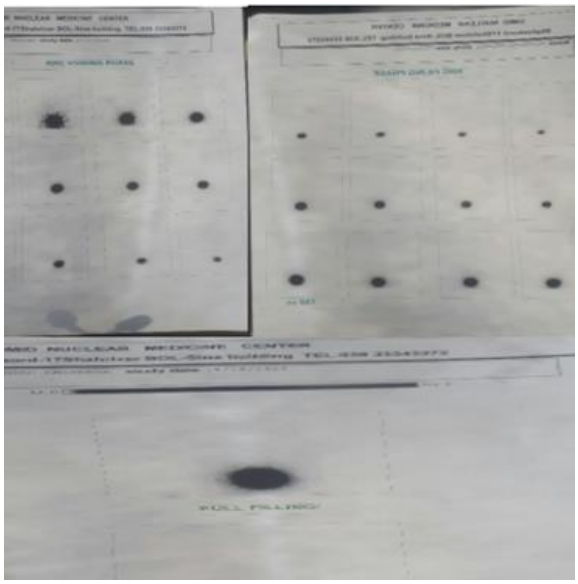

Figure 2. Direct RNC of the patient shows no VUR

After stabilization of the patient clinically and para clinically, a nephrostogram was done (the tip of the catheter was inserted into the collecting system and the contrast entered the ocular dilated kidney system), which showed no evidence of contrast leak from the system; however, the collecting system was dilated (Figure 3).

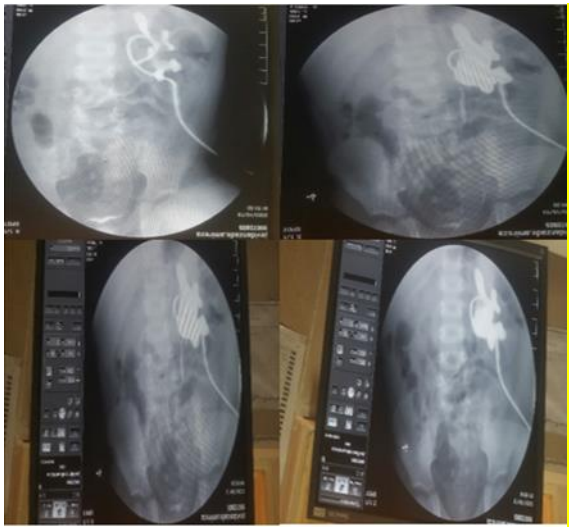

Figure 3. Retrograde cystography of the patient

The patient underwent left kidney pyeloplasty and nephrostomy was removed.

There was an improvement in the general condition of the patient. Abdominal distended reduced, and the levels of BUN and Cr decreased to 15 g/l and 0.8 mg/l the day after surgery, respectively. The results of laboratory analyses and urine culture were normal. A follow-up CT scan revealed an almost complete disappearance of the hydronephrosis and a normal ureter. Ureteropelvic junction obstruction (UPJO) was established as the cause of giant hydronephrosis.

Discussion

Obstruction of the urinary tract usually causes hydronephrosis, which is typically asymptomatic in the early phases. An obstructed kidney secondary to a ureteropelvic junction obstruction or ureterovesical junction obstruction can present as a unilateral mass or cause upper abdominal or flank pain on the affected site. Pyelonephritis may develop as a result of urinary stasis. An upper urinary tract stone can occur causing abdominal and flank pain and hematuria (1). In most of the cases, the range of the hydronephrotic kidney remains almost at the level of kidney. Our patient had a hydronephrotic kidney that occupied the abdominal cavity which induced pleural effusion; therefore, the aim of the present case study was to document a clear case of giant hydronephrosis secondary to UPJO. Clinical conditions like symptomatic nephrolithiasis and hydronephrosis are common presentations, and giant hydronephrosis is rare. A common cause of giant hydronephrosis is UPJO. Other causes include renal stones, trauma, renal ectopy, and ureteral tumors (2). In the present study, UPJO was the cause of giant hydronephrosis.

The clinical symptoms of giant hydronephrosis are non-specific, and it may present with vague symptoms. Giant hydronephrosis is a slowly progressive disease, and a huge abdominal mass or distended abdomen may cause pain. It may also cause hematuria, recurrent urinary tract infection or other symptoms like nausea, fatigue or dyspepsia, urinary tract infection, weight loss , renal insufficiency, gross hematuria resulting from trauma in the area, compression of surrounding structures, or even kidney rupture (3). Ultrasonography and CT scan have facilitated the diagnosis of hydronephrosis. A giant hydronephrosis can be defined as the presence of a hydronephrosis occupying a hemiabdomen, which meets, or extends beyond, the midline, and which extends at least five or six vertebral bodies in length (4). However, in some cases, it is difficult to differentiate between giant hydronephrosis and other cystic formations. The aim of the present case study was to document a clear case of UPJO-induced giant hydronephrosis. Contrast-enhanced CT of the abdomen and the pelvis is the 'gold standard' for an accurate diagnosis of giant hydronephrosis. Other useful diagnostic imaging techniques include abdominal radiography and intravenous urography. The ideal treatment for giant hydronephrosis is nephrectomy as the procedure of choice. Other treatment options in a functional kidney include percutaneous nephrostomy, reduction pyeloplasty with nephropexy, calycoureterostomy, and calycocystostomy (5). In spite of the widespread use of prenatal ultrasound and the development of new diagnostic techniques, giant hydronephrosis is encountered in all age groups. A puncture/drainage procedure may be performed in cases where the condition of the patient does not allow other treatments to be performed, or where hemodynamic changes may occur following a sudden abdominal decompression (6). Our patient underwent unilateral nephrostomy.

Conclusion

In conclusion, giant hydronephrosis is a rare condition, which is associated with the occurrence of cystic abdominal masses. The best surgical intervention is puncture/drainage procedure or nephrectomy.

Conflict of Interest

The authors declare no conflicts of interest.

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