

Images in Urology

Rare Cause of Hydronephrosis

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WHAT IS THE CAUSE OF RIGHT HYDRONEPHROSIS?

A 55-year-old female presented with right flank pain that had developed 7 days previously and was diagnosed as having right hydronephrosis on an abdominopelvic computed tomographic (CT) scan at a local clinic. She was referred to the Asan Medical Center for further evaluation.

At the time of the initial visit to the Asan Medical Center, the patient's right flank pain had subsided and the physical examination revealed no significant findings. The results of blood examinations were as follows (normal range in pa-

rentheses): peripheral white cell count, 6,400/ μ L (4,000 to 10,000); C-reactive protein, 1.03 mg/dL (<0.6); creatinine, 0.96 mg/dL (0.70 to 1.40); alanine aminotransferase, 13 IU/L (<40); aspartate aminotransferase, 15 IU/L (<40). Proteinuria was not observed, and urinary sedimentation included 6 to 10 white blood cells/high-power field. Urine culture and acid fast bacillus stain/culture showed no microorganisms.

An outside abdominopelvic CT scan revealed a conglomerated cystic mass involving the upper portion of the right kidney suggesting hydronephrosis, and perfusion of the right kidney was less than that of the left kidney (Fig. 1).

A 99m technetium-mercaptoacetyltriglycine (99m Tc-MAG3) renal scan revealed a severe decrease in right kidney function (relative function 16.1%) and complete obstruction of the right urinary tract ($T_{1/2} > 20$ minutes). Even after Lasix injection, cortical transit, parenchymal washout, and excretion of the right kidney were not visible.

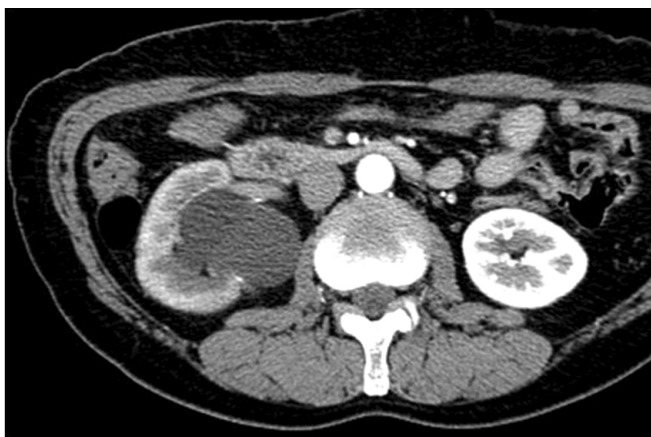


FIG. 1. Abdominopelvic computed tomographic scan showed a cystic mass involving the right kidney.

THE DIAGNOSIS: URETEROPELVIC JUNCTION (UPJ) OBSTRUCTION CAUSED BY A PARAPELVIC CYST COUPLED WITH CROSSING RENAL VESSELS

Under suspicion of right UPJ obstruction, surgical management was planned. A double-J ureteral stent was placed before surgery, and a diethylene tetramine penta-acetic acid scan was performed (relative function 29.2%).

Because the imaging studies suggested crossing vessels as the cause of the right hydronephrosis, laparoscopic dismembered pyeloplasty was planned. Retrograde pyelography was performed immediately before the surgery to redefine the pathologic segment.

After the induction of general anesthesia, the patient was placed in the left lateral position. A Hasson trocar was inserted along the right pararectus line at the umbilicus level and a pneumoperitoneum was created via the trocar. Under a laparoscopic view, the intraabdominal organs were examined and two 12-mm trocars were inserted in an obtuse triangular form. The Gerota's fascia and perirenal fat were excised to expose the hilar portion of the right kidney. We found a parapelvic cyst, having a typical blue dome appearance, behind the right ureter and crossing renal vessel. The renal pelvis above the crossing vessel was dilated (Fig. 2A).

First, the cyst wall was opened by use of electrocautery scissors and clear fluid was aspirated from inside the cyst. The UPJ segment was dismembered and transposed anteriorly to the crossing vessels. Ureteropelvic continuity was reestablished by use of 6-0 Vicryl continuous sutures. A double-J ureteral stent was inserted in an antegrade fashion after completion of the posterior layer of approximation followed by reunion of the anterior layer (Fig. 2B).

The double-J ureteral stent was removed 1 month after the surgery. After 3 months, the patient underwent a follow-up visit with clinical appraisal, CT urography, and a

^{99m}Tc-MAG3 renal scan. She has remained free of symptoms for 4 months postoperatively. Follow-up CT urography revealed decreased right hydronephrosis with good contrast passage through the right urinary tract and obliteration of the parapelvic cyst. The ^{99m}Tc-MAG3 renal scan revealed moderately decreased function of the right kidney (relative function 24.0%) without obstruction ($T_{1/2}$ =13.5 minutes).

Unlike simple renal cysts, parapelvic cysts do not lie within the renal parenchyma but are located on the renal hilum near the renal pelvis. Thus, parapelvic cysts are more likely to be symptomatic, despite being less common [1]. In the current literature, laparoscopic marsupialization is the treatment of choice in a symptomatic case [2].

Common extrinsic causes of upper urinary tract obstruction include retroperitoneal fibrosis, pelvic lipomatosis, obstetric and gynecologic origins, and vascular origins. Since a report by Braasch in 1909, extrinsic obstruction caused by crossing vessels has been regarded as an important cause of obstruction in adults. Even though the underlying anatomical relationships are not fully understood, UPJ obstruction by crossing vessels has been suggested to be caused by incomplete rotation of the kidney [3]. Pyeloplasty with ureteral transposition is the definitive treatment of choice if a crossing vessel is present [4,5].

In the present case, we believed that crossing vessels were an immediate cause of the UPJ obstruction and that the parapelvic cyst was a prevenient cause of that. However, we could not calculate the relative level of contribution of these two causes to the UPJ obstruction. Thus, we decided to correct both the immediate and the prevenient cause. To our knowledge, this is the second case of UPJ obstruction combined with crossing vessels and a parapelvic cyst reported in the literature. In another reported case, the patient successfully underwent laparoscopic pyeloplasty with unroofing of the parapelvic cyst [6]. In conclusion, the results of these two cases may demonstrate a

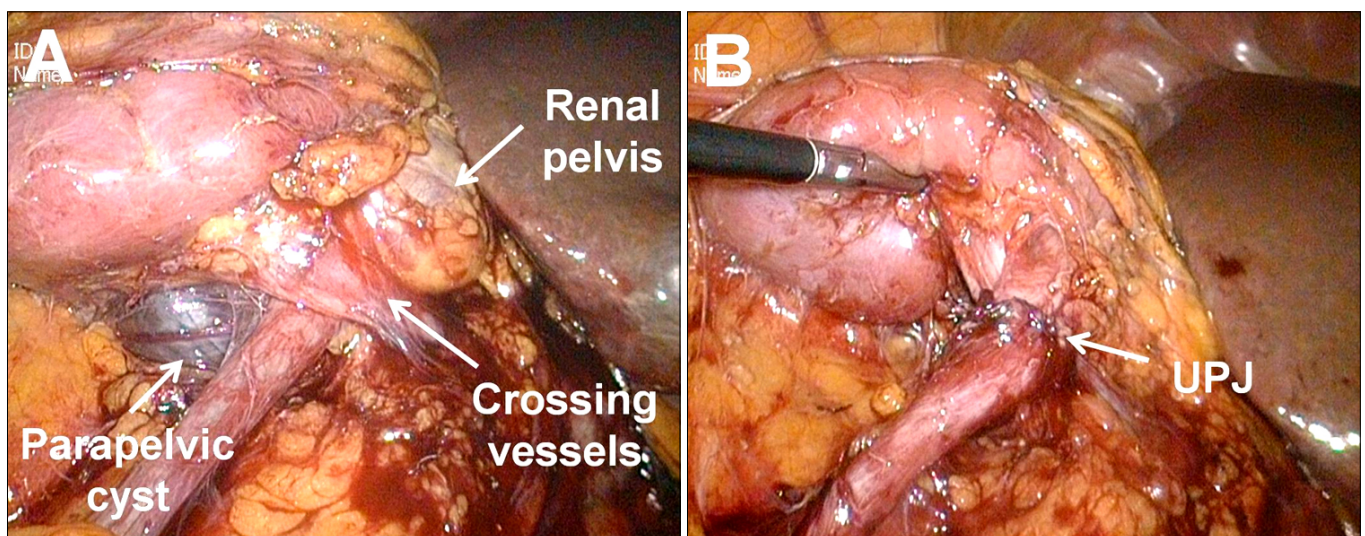


FIG. 2. (A) Laparoscopic view before the surgery. (B) Laparoscopic view after the surgery. UPJ, ureteropelvic junction.

rare cause of UPJ obstruction and suggest a treatment strategy.

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