

**> THE PATIENT**

21-year-old man

**> SIGNS & SYMPTOMS**

- Abdominal distention
- Loss of appetite
- Elevated creatinine

**> THE CASE**

A 21-year-old male college student sought care at our urology clinic for a 2-year history of progressive abdominal distention and loss of appetite due to abdominal pressure. On physical examination, his abdomen was distended and tense, but without any tenderness on palpation or any costovertebral angle tenderness. He had no abdominal or flank pain, and wasn't in acute distress. His blood pressure was normal.

Initial lab test results were significant for elevated creatinine at 2.7 mg/dL (normal: 0.7-1.3 mg/dL) and blood urea nitrogen (BUN) at 31.1 mg/dL (normal: 6-20 mg/dL). Results of a complete blood count (CBC) were within normal ranges, including a white blood cell (WBC) count of 7900, hemoglobin level of 15.1 g/dL, and platelet count of 217,000/mcL. A urinalysis showed only a mild increase in the WBC count.

**THE DIAGNOSIS**

We performed a computed tomography (CT) scan of the patient's abdomen, which revealed bilateral hydronephrosis secondary to ureteropelvic junction obstruction (UPJO). The patient's right kidney was mildly to moderately enlarged, but the left kidney was massive (**FIGURE 1A**). The hydronephrotic left kidney had extended itself across the midline (**FIGURE 1B**), pushed the ipsilateral diaphragm upward, and displaced the bladder downward.

The patient underwent right-sided ureteral stent placement for temporary drainage and a complete left-sided nephrectomy. During the surgery, the left kidney was first aspirated, and more than 11,000 cc of clear urine was drained. (Aspiration reduced the kidney size, allowing the surgeon to make a smaller incision.) The removed kidney contained an additional 1200 cc of cloudy residual fluid (**FIGURE 2**). UPJO was confirmed by the pathological examination of the excised organ.

**DISCUSSION**

UPJO is the most common etiology for congenital hydronephrosis.<sup>1</sup> Because it can cause little to no pain, hydronephrosis secondary to UPJO can be asymptomatic and may not present until later in life. Frequently, an abdominal mass is the initial clinical presentation.

When the hydronephrotic fluid exceeds 1000 cc, the condition is referred to as giant hydronephrosis.<sup>2</sup> Although several cases of giant hydronephrosis secondary to UPJO have been reported in the medical literature,<sup>3-5</sup> the volume of the hydronephrotic fluid in these cases rarely exceeded 10,000 cc. We believe our patient may be the most severe case of hydronephrosis secondary to bilateral UPJO, with 12,200 cc of fluid. His condition reached this late stage only because his right kidney retained adequate function.

Diagnosis of hydronephrosis is straightforward with an abdominal ultrasound and/or CT scan. Widespread use of abdominal ultrasound as a screening tool has significantly increased the diagnosis of asymptomatic hydronephrosis, and many cases are secondary to UPJO.<sup>6</sup> The true incidence of UPJO is unknown, but it is more prevalent in males than in

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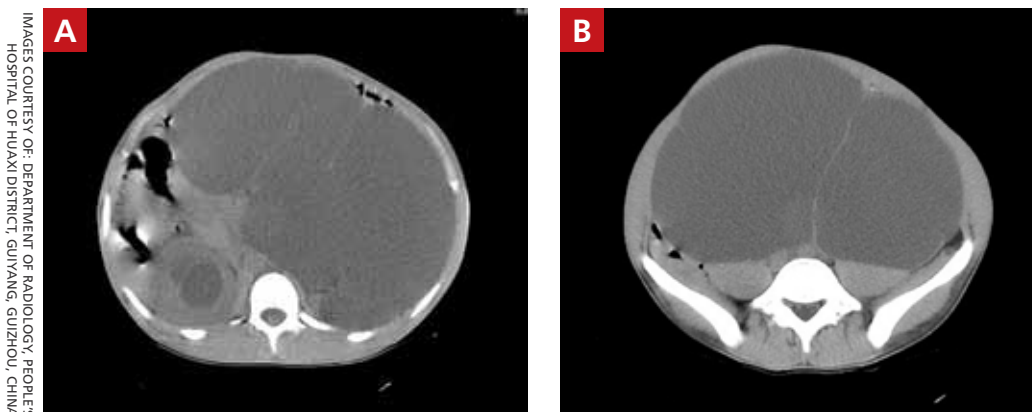
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FIGURE 1

## Giant hydronephrosis—in the extreme



A computed tomography scan revealed bilateral hydronephrosis secondary to ureteropelvic junction obstruction (A). The hydronephrotic left kidney extended itself across the midline (B).

females, and in 10% to 40% of cases, the condition is bilateral.<sup>7</sup> Congenital UPJO typically results from intrinsic pathology of the ureter. The diseased segment is often fibrotic, strictured, and aperistaltic.<sup>8</sup>

### Treatment choice depends on whether renal function can be preserved

Treatment of hydronephrosis is straightfor-

ward; when there is little or no salvageable renal function (<10%), a simple nephrectomy is indicated, as was the case for our patient. Nephrectomy can be accomplished by either an open or laparoscopic approach.

When there is salvageable renal function, treatment options include pyeloplasty and pyelotomy. Traditionally, open dismembered pyeloplasty has been the gold standard. However, with advances in endoscopic and laparoscopic techniques, there has been a shift toward minimally invasive procedures. Laparoscopic pyeloplasty—with or without robotic assistance—and endoscopic pyelotomy—with either a percutaneous or retrograde approach—are now typically performed. Ureteral stenting should only be used as a temporary measure.

■ **Our patient.** Four weeks after the nephrectomy, our patient underwent a right side pyeloplasty, which was successful. He had an uneventful recovery from both procedures. His renal function stabilized and other than routine follow-up, he required no additional treatment.

FIGURE 2

## Patient's kidney contained more than 12,000 cc of fluid



More than 11,000 cc of urine was drained from the patient's left kidney during surgery to facilitate the nephrectomy. Another 1200 cc of cloudy residual fluid was found in the removed kidney.

### THE TAKEAWAY

Most cases of hydronephrosis in young people are due to congenital abnormalities, and UPJO is the leading cause. However, the condition can be asymptomatic and may not

present until later in life. Whenever a patient presents with an asymptomatic abdominal mass, hydronephrosis should be part of the differential diagnosis. Treatment options

include nephrectomy when there is no salvageable kidney function or pyeloplasty and pyelotomy when some kidney function can be preserved.

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