

## Abnormal Kidney Ultrasound in a Transplant Patient with AKI

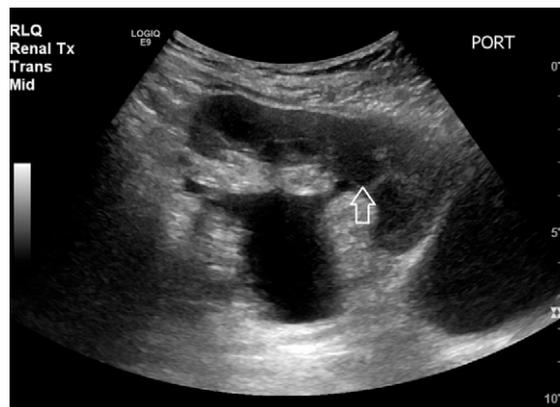
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### Case Description

A 37-year-old man initially presented to an outside emergency department with subjective fever, vomiting, diarrhea, and dysuria. He had ESKD secondary to a posterior urethral valve and reflux nephropathy, for which he had undergone a deceased-donor kidney transplant. On physical examination, the patient was normotensive, tachycardic, and febrile, and he had mild diffuse abdominal tenderness. Laboratory studies showed a serum creatinine level of 2.98 mg/dl (normal range, 0.7–1.3 mg/dl). Both blood and urine cultures grew *Escherichia coli*. Initial ultrasound was read as moderate to severe hydronephrosis of the transplanted kidney. He was then referred to our institution for further evaluation and management of his allograft hydronephrosis, *i.e.*, for possible nephrostomy tube placement. After transfer, a repeat ultrasound was performed, which showed no hydronephrosis but an extrarenal pelvis (Figure 1). The patient was hydrated and treated with antibiotics. His serum creatinine decreased to 1.39 mg/dl. He was eventually discharged in an improved state with no further intervention.

An extrarenal pelvis is a normal anatomic variant. It refers to the presence of the renal pelvis outside the renal hilum and is reportedly found in about 10% of the population (1,2). It is bigger in size and more distensible than an intrarenal pelvis surrounded by sinus fat (1). It can appear as a large hypoechoic mass outside the renal sinus (Figure 1) and can be easily mistaken for hydronephrosis, particularly on a point-of-care ultrasound. It can be differentiated from true hydronephrosis



**Figure 2.** | A transverse view of the kidney allograft shows a medullary pyramid (arrow) above the central hypoechoic mass, suggestive of preserved corticomedullary differentiation.

because it shows preserved corticomedullary differentiation without dilated calyces (Figure 2) (1,2). It is also not associated with either a hydroureter or an enlarged kidney *per se*. Further investigation with either a computed tomography scan or a magnetic resonance imaging scan can clarify a false interpretation on ultrasound. Although an extrarenal pelvis is typically benign, complications, including infection and stone formation, could occur and have been reported in the literature (3).



**Figure 1.** | An extrarenal pelvis (arrow) can mimic hydronephrosis on ultrasound.

### Teaching Points

- An extrarenal pelvis is a normal anatomic variant and refers to the presence of the renal pelvis outside the renal hilum.
- An extrarenal pelvis can mimic hydronephrosis, particularly on a point-of-care ultrasound, and can incorrectly suggest obstructive nephropathy.
- An extrarenal pelvis can be radiographically differentiated from a true hydronephrosis because it shows preserved corticomedullary differentiation without dilated calyces.

### Disclosures

All authors have nothing to disclose.

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**Author Contributions**

A. Bentall and J. Sy-Go reviewed and edited the manuscript; J. Sy-Go and S. Thirunavukkarasu wrote the original draft.

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