

# THE DIAGNOSIS OF ECTOPIC URETER IN A PATIENT WITH RENAL INSUFFICIENCY BY MAGNETIC RESONANCE UROGRAPHY

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## ABSTRACT

We report an ectopic ureter associated with right solitary kidney and renal insufficiency. Since the serum creatinine level of the patient was high, intravenous urography could not be performed. The diagnosis of ureteral ectopia was only achieved by magnetic resonance urography.

**Key Words:** Ectopic Ureter, MR Urography, Renal Insufficiency.

## BÖBREK YETMEZLİĞİ OLAN BİR ÇOCUKTA MR ÜROGRAFI İLE EKTOPIK ÜRETER TANISI

### ÖZ

Sağ soliter böbrek ve böbrek yetmezliği ile ilişkili ektopik üreter olgusunu sunduk. Hastanın serum kreatinin seviyesi yüksek olduğundan, çocuğa intravenöz pyelografi uygulanamadı. Üreteral ektopi tanısının konulması sadece Manyetik Rezonans Ürografi ile başarılıdır.

**Anahtar Kelimeler:** Ektopik Üreter, MR Ürografi, Renal Yetmezlik.

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## INTRODUCTION

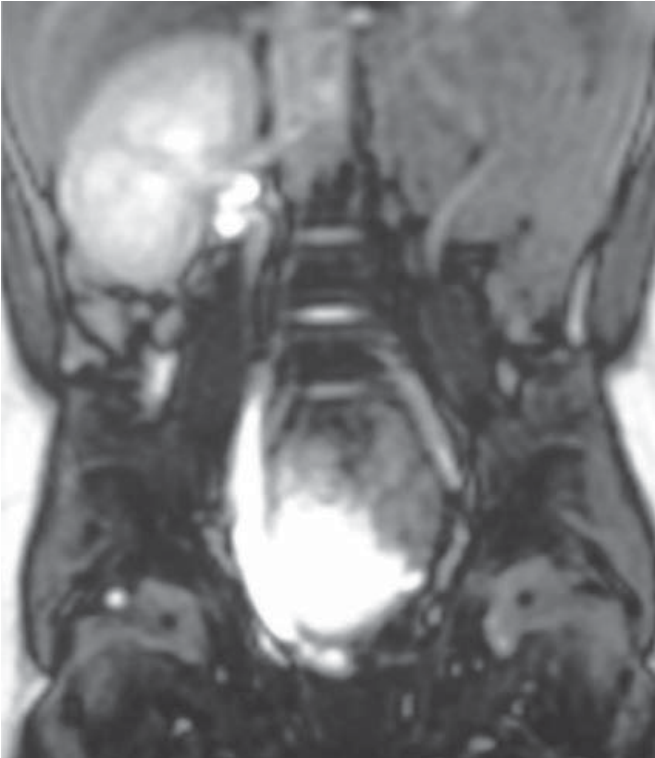
The term "ectopic ureter" describes a ureter that inserts distal to its normal location or reproductive tract. If the ureter terminates at a level proximal to the continence mechanism or at the reproductive tract, ectopic ureter is associated with ureterohydronephrosis and renal tissue is often poor or nonfunctional. Thus, the diagnosis of ectopic ureter in these cases may be very difficult or impossible with conventional radiographic imaging. Developed magnetic resonance imaging (MRI), called magnetic resonance urography (MRU), permits the assessment of both the functioning and morphology of the urinary tract (UT)<sup>1</sup>. It has two sequences: T2-weighted sequence of MRU can be satisfactory especially in the evaluation of the highly dilated UT, and T1-weighted sequence of MRU (excretory MRU) enables dynamic evaluation of the UT by the injection of intravenous paramagnetic contrast material (gadolinium-DTPA) and can be applied in patients with renal insufficiency at the initial stage.<sup>2</sup> We report a child with ectopic ureter associated with renal insufficiency diagnosed only by MRU.

## CASE REPORT

A 2-year-old boy presented with urinary infection. He also had an anorectal malformation. Absence of the left kidney and right ureterohydronephrosis were observed on ultrasonography (US). No vesicoureteral reflux was present on voiding cystourethrography. Serum creatinine level was 1.9 mg/dl and so intravenous urography (IVU) could not be performed. Three-dimensional gradient echo T1-weighted sequence MRU was performed by the injection of 0.2 mmol/kg gadolinium-DTPA intravenously and T1-weighted sequence images were acquired for 20 minutes. MRU completely demonstrated the right UT and revealed the right ureter inserted in the right seminal vesicle (Figure 1). The urinary infection was treated with parenteral antibiotherapy and nephrostomy was urgently performed. After the initial treatment, the serum creatinine level did not decrease. The diagnosis of ectopic ureter was confirmed with antegrade pyelography (Figure-2). Finally, ureteroneocystostomy was performed. Dilatation of the right kidney disappeared and the serum creatinine level decreased to 1.3 mg/dl during the follow up.

## DISCUSSION

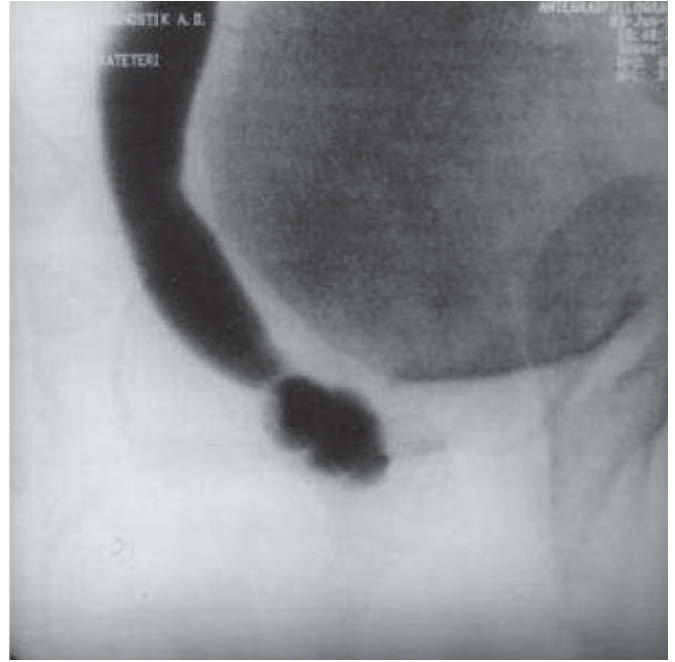
Ectopic ureter appears in different clinical scenarios based on the termination site. It may be bilateral or unilateral and associated with ureteral duplication or ureterohydronephrosis. Approximately 85% of ectopic ureters drain the upper pole moiety of a duplex kidney in females and ectopic ureters are more commonly associated with a dilated single system in males.<sup>3-5</sup> US can rarely determine the termination site of ectopic ureter.<sup>6</sup> Another conventional imaging method, IVU, is able to visualize the ectopic ureter that has sufficient renal functioning in some cases. Nevertheless,



**Figure 1:** MRU completely demonstrated right urinary tract and revealed ureter that inserted in right seminal vesicle.

the moiety of kidney where the ectopic ureter drains is generally dysplastic or ureterohydronephrotic or both.<sup>7</sup> As renal functions are decreased in these patients, IVU is insufficient for imaging. MRU has become an accepted method for evaluating the dilated and complicated urinary system anomaly. Depicting anatomy with higher contrast, three-dimensional and spatial resolution in any orthogonal plane is the most important advantage of MRU.<sup>1</sup> In addition, MRU is considered a valuable method in the diagnosis of ectopic ureters draining dysplastic or poor functioning renal moiety.<sup>7</sup> MRU delineates the renal moiety independent from functioning renal tissue and visualizes the caliber, course, and termination sites of the ectopic ureter. The unique diagnostic technique is MRU in patients with renal insufficiency at the initial stage (creatinine level lower than 3 mg/dl).<sup>8</sup> In our case, conventional imaging techniques were completely useless since the patient had renal failure and ectopic ureteral insertion was visualized only by MRU. In conclusion, MRU is a valuable and accurate modality for the diagnosis of ectopic ureters draining dysplastic or poor functioning renal moiety and is the unique choice of imaging in patients with renal insufficiency.

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**Figure 2:** Antegrade pyelography confirmed the diagnosis of ectopic ureter and site of its termination.

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