

Magnetic Resonance Urography in a Girl with Persistent Perineal Wetting

Chung-Cheng Yu, M.D.¹, Ji-Nan Sheu, M.D., Ph.D.^{2,4}, Gin-Den Chen, M.D.^{3,4}, Soo-Cheen Ng, M.D.^{3,4}, Sung-Lang Chen, M.D., Ph.D.^{1,4*}

Department of Urology¹, Pediatrics² and Obstetrics and Gynecology³, Chung Shan Medical University Hospital, Taichung, Taiwan; School of Medicine⁴, Chung Shan Medical University, Taichung, Taiwan

*Correspondence: Department of Urology, Chung-Shan Medical University Hospital, 110, Section 1, Chien-Kuo North Road, Taichung, Taiwan
E-mail: cshy650@csh.org.tw

BRIEF HISTORY

A 5 year-old girl presented with intermittent urinary incontinence as well as normal voiding since she had been toilet trained. She had been evaluated previously at another medical center where renal sonography showed mild left hydronephrosis. Only antibiotics and imipramine were given. Unfortunately, the urinary leakage persisted despite treatment. She was then referred to our pediatric nephrology outpatient clinic. Physical examination revealed a girl with normal growth for her age wearing a diaper. Urine dripped intermittently from her vaginal orifice. Laboratory tests showed no significant abnormalities. Magnetic resonance (MR) urography showed left renal duplication with a small dysplastic upper moiety (Fig. 1A). The upper ureter drained into the vagina (Fig. 1B). In addition, the lower moiety demonstrated hydronephrosis and a hydroureter. Lower ureterovesical junction stricture was suspected. We performed a cystourethroscopy under anesthesia in the operating room. After the bladder was filled with methylene blue via a urethral catheter, a clear fluid drained into the vulva. Cystourethroscopy showed a well-developed bladder trigone. An ectopic ureteral opening could not be visualized in the bladder, urethra, vagina and vestibule. Only erythema was noted, which may have been due to diaper rash. The patient subsequently underwent surgical exploration. During exploration, we confirmed that the upper moiety drained into the vagina, and the lower moiety ureter was positioned normally but with a ureterovesical junction stricture and lower ureter atresia. Most ectopic ureters drain renal moieties that have minimal function. Therefore, a nephrectomy for the involved moiety is often recommended [1]. In our case, the duplicated ureters were reimplanted into the urinary bladder separately. This was done because the ectopic ureter was healthier and excreted much more urine than the lower moiety ureter. The girl's parents also requested preservation of the upper moiety. The patient was completely continent after the operation.

Modern MR urography is performed on the basis of two different imaging strategies, which can be used complementarily to cover almost all aspects of diagnosis of upper urinary tract diseases. The first technique utilizes an unenhanced, heavily T2-weighted pulse sequence to show static fluid in the urinary tract. Static fluid MR urography offers a diagnostic tool which is independent of the renal excretory function [2]. Thus an important advantage of T2-weighted MR urography is that it can be performed even in a patient with non-excreting kidneys [3]. MR urography also shows superiority and utility in the evaluation of ectopic ureters and functional renal moieties [4]. Furthermore, MR urography is critical in diagnosing duplicated ureters in girls with perineal wetting. In cases of duplicated collecting systems, MR urography has

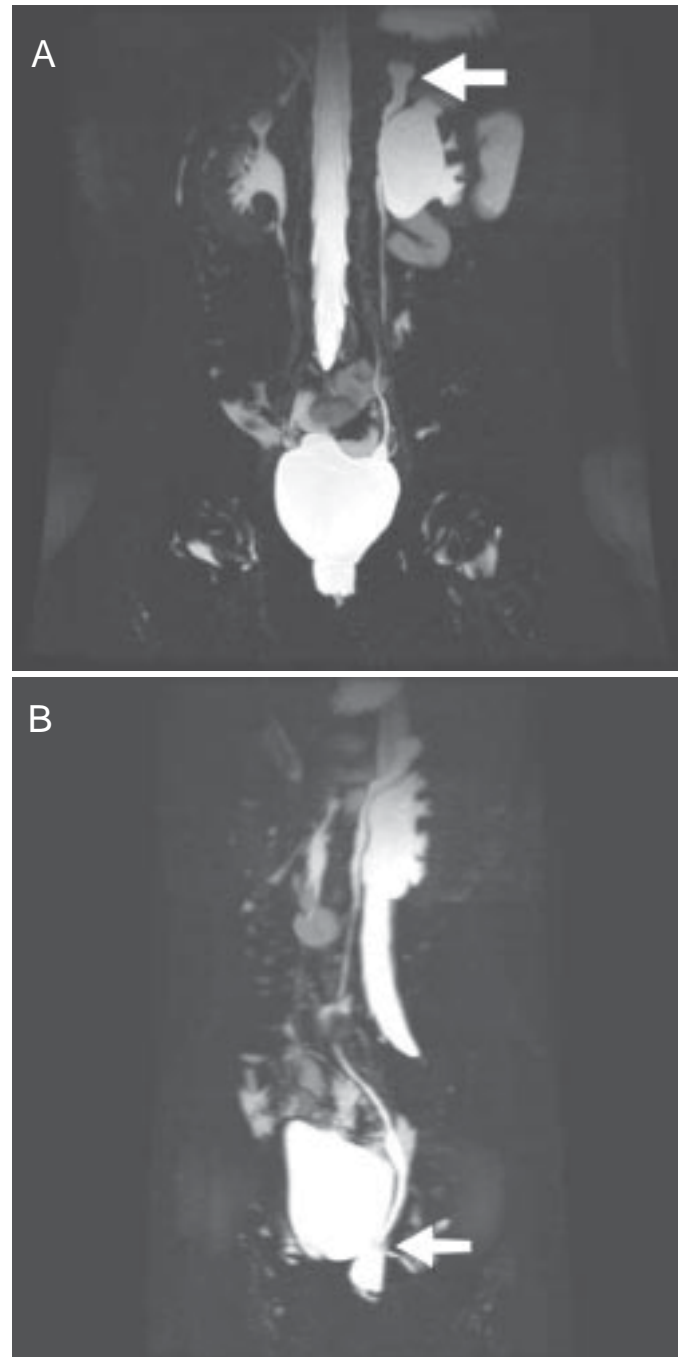


Fig. 1. T2-weighted magnetic resonance urography shows. (A) A mildly hypoplastic upper moiety (arrow), lower moiety hydronephrosis and a hydroureter. (B) The upper moiety ureter drains into the vagina (arrow).

been shown to more clearly demonstrate the anatomy of the renal parenchyma, the renal collecting system, and the ureter and ureteral orifice than intravenous urography and pelvic ultrasound [5].

MR urography also has the potential to revolutionize the imaging of the urinary tract in children, providing an unprecedented level of anatomic information combined with quantitative functional evaluation of each kidney [6]. This noninvasive technique may be useful when findings on sonography or physical examination are subtle or overlooked. In this case, MR urography clearly demonstrated the completely duplicated kidney with the upper moiety ureter draining ectopically into the vagina and the lower moiety ureterovesical junction stricture. This example also highlights the need for careful examination of the kidneys, since the ureters may not be visualized on conventional urography because of limited excretion from a dysplastic upper pole moiety in patients with a suspected ectopic ureter.

We conclude that MR urography may facilitate early diagnosis of subtle renal duplication with an infrasphinteric ectopic ureteral insertion in girls with persistent perineal wetting. Surgery may allow for a rapid cure of these distressing and unpleasant symptoms.

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