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Case Report

Side-to-side refluxing ureteroneocystotomy for an infant with refluxing and obstructed ectopic ureter associated with duplex system

Eiji Hisamatsu,* Motofumi Tajima, Atsunori Muraki, Kaoru Yoshino

Department of Urology, Aichi Children's Health and Medical Center

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ABSTRACT

Background: Surgical management of the obstructed ectopic ureter is one of the most difficult problems, particular in neonates and infants. The bladder-level definitive repair has technical limitations during infancy due to the size discrepancy between the ureter and the bladder.

Case Presentation: We report our experience of side-to-side refluxing ureteroneocystotomy (SSRUC) as a temporary procedure for an infant with refluxing and obstructed ectopic ureter associated with a duplex system.

Conclusion: SSRUC relieved obstruction and controlled febrile UTI successfully while waiting for maturation of the bladder required for the bladder-level definitive repair.

Keywords: Ectopic, infant, obstruction, reflux, ureter.

INTRODUCTION

Surgical management of the obstructed ectopic ureter is one of the most difficult problems, particular in neonates and infants. Standard ureteral reimplantation with plication or excisional tapering has technical limitations during infancy due to the size discrepancy between the ureter and the bladder. Therefore, a temporary procedure is required to control urinary tract infection (UTI) and renal damage before the definitive repair is feasible. However, percutaneous drainage requires handling the nephrostomy tube. Cutaneous ureterostomy also has potential disadvantages including stomal stenosis and febrile UTI.[1] In 2005, Lee and Kaefer reported ureteral refluxing reimplantation as temporary procedure to overcome the disadvantages of percutaneous nephrostomy and cutaneous ureterostomy. The technique consists of simply dividing the ureter proximal to the obstruction and performing an end-to-side refluxing anastomosis to the bladder.[2] Afterward, Alyami et al. modified the technique by leaving the obstructed segment in situ and performing a side-to-side ureteroneocystotomy (SSRUC) proximal to the obstruction.[3] We report our experience of SSRUC for an infant with refluxing and obstructed ectopic ureter associated with a duplex system.

CASE REPORT

A baby boy weighing 2722 g was delivered at 36 weeks gestation by elective repeat Cesarean section. At 31 weeks gestation, prenatal ultrasonography (US) revealed urinary tract dilation, and subsequent prenatal magnetic resonance imaging confirmed a left megaureter (Figure 1a). After birth, he was placed on continuous antibiotic prophylaxis. At 3 months of age, voiding cystourethrography (VCUG) showed left grade I reflux, suggesting that the contrast medium flowed up from the posterior urethra (Figure 1b). Dimercaptosuccinic acid renal scintigraphy demonstrated a left duplex system with decreased uptake in the upper moiety (Figure 1c). He developed breakthrough UTI shortly after the work-up. Although parenteral antibiotics and bladder drainage improved his general condition immediately, large amounts of debris persisted in the left dilated ureter on US (Figure 1d). He was referred to our center for further management of the persistent debris in the dilated ureter.

Correspondence*: Dr. Eiji Hisamatsu, Department of Urology, Aichi Children's Health and Medical Center, Japan.
Email: fpsfd412@yahoo.co.jp

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The imaging studies led to the diagnosis of refluxing and obstructed ectopic ureter associated with a duplex system. Definitive repair by common sheath reimplantation with excisional ureteral tapering was thought to be challenging because of the small bladder capacity. For this reason, we decided to perform SSRUC requiring no external drainage or stoma as a temporary procedure.

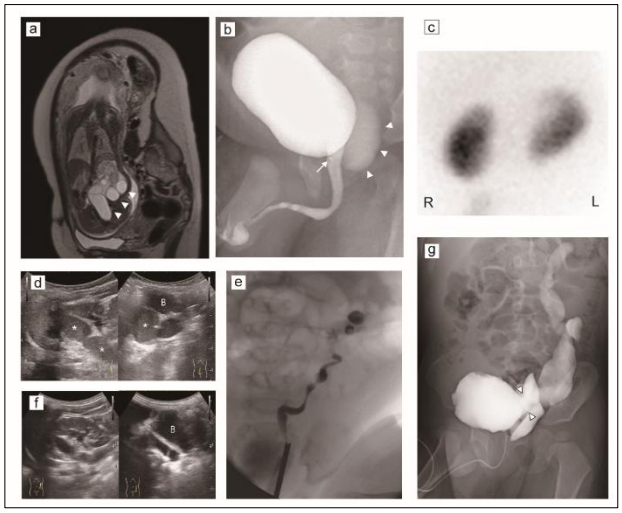

Figure 1: (a) Prenatal magnetic resonance imaging showed a left megaureter (arrowheads). (b) Voiding cystourethrography (VCUG) showed left grade I reflux (arrowheads), suggesting that the contrast medium flowed up from the posterior urethra (arrow). (c) Dimercaptosuccinic acid renal scintigraphy demonstrated left duplex system with decreased uptake in the upper moiety. (d) Large amounts of debris (*) persisted in the left dilated upper ureter on ultrasonography. B: bladder. (e) Retrograde pyelography through the left ureteral orifice in the bladder showed a left non-dilating lower pole ureter. (f) Dilation of the left upper ureter improved on ultrasonography after the side-to-side ureteroneocystotomy. B: bladder. (g) VCUG revealed a massive reflux into the left upper pole ureter through the anastomosis (arrowheads)

Cystoscopy showed an ectopic opening in the posterior urethra and bilateral ureteral orifices in the bladder. A ureteral catheter could not be passed through the ectopic opening. Retrograde pyelography through the left ureteral orifice in the bladder showed a left non-dilating lower pole ureter (Figure 1e). Subsequently, we proceeded to dissect the left paravesical space through a Pfannenstiel incision after placement of a urethral catheter. The dilating upper pole ureter was identified, and the medial surface of the upper pole ureter and corresponding lateral bladder wall were incised longitudinally (1.5cm) with particular attention to the lower pole ureter. The incised upper pole ureter and bladder wall were anastomosed using 5-0 polyglactin running sutures in a side-to-side fashion. A ureteral stent through the anastomosis was not placed. The urethral catheter was removed on postoperative day five.

Dilation of the left upper ureter improved on ultrasonography after the SSRUC (Figure 1f). Although he had developed no febrile UTI during the follow-up, severe pyuria came to be recognized from the age of 15 months. VCUG revealed a massive reflux into the left upper pole ureter through the anastomosis (Figure 1g). It was thought that residual urine caused by the massive reflux could lead to the persistent severe pyuria. Therefore, we performed the left common sheath reimplantation with excisional tapering of the upper pole ureter. He has been doing well postoperatively without any evidence of UTI.

DISCUSSION

SSRUC relieved obstruction and controlled febrile UTI successfully while waiting for maturation of the bladder required for the bladder-level definitive repair. Alternatively, we could have performed a definitive repair independent of the bladder size such as an upper heminephrectomy or ipsilateral ureteroureterostomy. However, we had concerns about residual urine in the ureteral stump after upper heminephrectomy or ipsilateral ureteroureterostomy during infancy. Although urine can flow up through the ectopic opening due to physiological high voiding pressure[4], the residual urine cannot flow during the storage phase under low pressure in the ureteral stump. In the meantime, the ureteral stump can dilate progressively, which can pose problems such as febrile UTI and abscess (Figure 2a).[5] On the other hand, SSRUC can force the urine into the bladder even if the urine could flow up through the ectopic opening (Figure 2b).

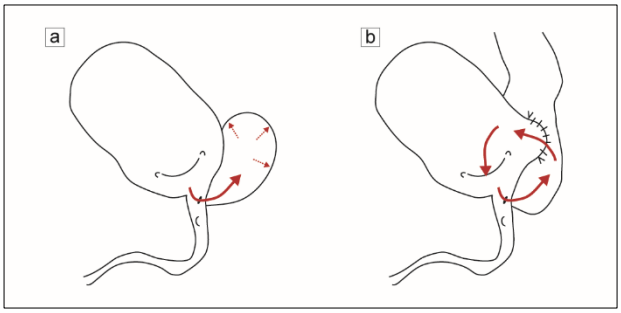

Figure 2:(a) The ureteral stump could dilate progressively due to the urine flowing up through the ectopic opening during the voiding phase. (b) Side-to-side ureteroneocystotomy can force the urine into the bladder even if the urine could flow up through the ectopic opening

In conclusion, SSRUC is a safe and effective procedure for infants with refluxing and obstructed ectopic ureter associated with a duplex system. This procedure allows time for the infant's bladder to mature, while relieving obstruction and controlling febrile UTI.

Conflict of Interest: Nil

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Consent to Publication: Author(s) declared taking informed written consent for the publication of clinical photographs /material (if any used), from the legal guardian of the patient with an understanding that every effort will be made to conceal the identity of the patient, however it cannot be guaranteed.

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