


Case Report

Endoscopic combined intrarenal surgery without ureteral access sheath performed for renal stone after Cohen reimplantation

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Abbreviations & Acronyms

CT = computed tomography

ECIRS = endoscopic combined intrarenal surgery

GW = guidewire

KUB = Kidney–ureter–bladder

UAS = ureteral access sheath

VUR = vesicoureteral reflux

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Introduction: Endoscopic combined intrarenal surgery after anti-reflux operation is rarely performed.

Case presentation: A 37-year-old female was referred to our hospital for treatment of left renal stone. She underwent anti-reflux surgery (Cohen reimplantation) for left vesicoureteral reflux at the age of 10 years. Computed tomography revealed a 17 × 11 mm left inferior calyceal calculus. The patient received retrograde double-J stent insertion under radiographic guidance and underwent ultra-mini endoscopic combined intrarenal surgery without ureteral access sheath. The patient was discharged on postoperative Day 5 with no postoperative complications. Postoperative cystography showed no recurrence of vesicoureteral reflux. One month after the operation, kidney–ureter–bladder radiography and computed tomography scan revealed no residual stones or hydronephrosis.

Conclusion: Ultra-mini endoscopic combined intrarenal surgery without ureteral access sheath is an effective method for treating renal stones after Cohen reimplantation.

Key words: Cohen reimplantation, endoscopic combined intrarenal surgery, kidney stone, vesicoureteral reflux.

Keynote message

Ultra-mini endoscopic combined intrarenal surgery without urethral access sheath is an effective method for treating renal stones after Cohen reimplantation.

Introduction

Reimplantation technique, initially described by Cohen in 1975,¹ is commonly used for surgical treatment of vesicoureteral reflux (VUR) in pediatric patients. However, there is limited research on endoscopic management of urinary stones in individuals who have previously undergone Cohen's reimplantation. This report presents the case of a patient who developed a left renal stone, 27 years after undergoing Cohen reimplantation for VUR. We performed ultra-mini endoscopic combined intrarenal surgery (ECIRS) without ureteral access sheath (UAS).

Case presentation

We encountered the case of a young woman with a left renal stone. The patient was 37 years old (height, 158 cm; weight, 49 kg; body mass index, 19.6 kg/m²) and had a medical history of left Cohen reimplantation for VUR at the age of 10 years. She was referred to our hospital after identification of a left renal stone on abdominal ultrasonography. Kidney–ureter–bladder (KUB) radiography and abdominal computed tomography (CT) revealed a 17 × 11 mm stone in the left lower calyx. Abdominal CT revealed a stone volume of 1.7 mL and the CT value of 1492 HU (Fig. 1). The patient expressed a strong desire for a stone-free outcome as she was planning to conceive. To achieve this goal and adequately observe the renal pelvis using both percutaneous and ureteroscopy approaches, we chose ECIRS instead of PCNL. To



Fig. 1 Computed tomography showed a left kidney stone measuring 17 × 11 mm (arrow).

prevent ureteral injury, we planned to place a ureteral stent preoperatively and perform ultra-mini ECIRS without UAS.

A cystogram did not reveal VUR. A double-J ureteral stent was inserted preoperatively for the purpose of ureteral dilation. The left ureteral orifice was identified as caudal to the right ureteral orifice (Fig. 2). As it was difficult to insert a straight-type guidewire (GW), an angled-type GW was inserted into the left ureter (Fig. 3). A 6Fr 24 cm double-J ureteral stent (BARD, Inlay Optima™) was placed. One week after the ureteral stent insertion, ultra-mini ECIRS was performed under general anesthesia with the patient in the modified Valdivia position. Without UAS, a flexible ureteroscope (Olympus URF-P6™) was inserted into the left ureter. The lower calyx was punctured under ultrasound guidance, and after dilation with an 8.5/9.5Fr one-step dilator® (Storz), a rigid nephroscope (Storz XS Ultra-mini™) and Ho-YAG laser (Lumenis Versa Pulse 100®) were used to perform



Fig. 2 Cystoscopy. The arrow showed left ureteral orifice. The dotted arrow showed right ureteral orifice.

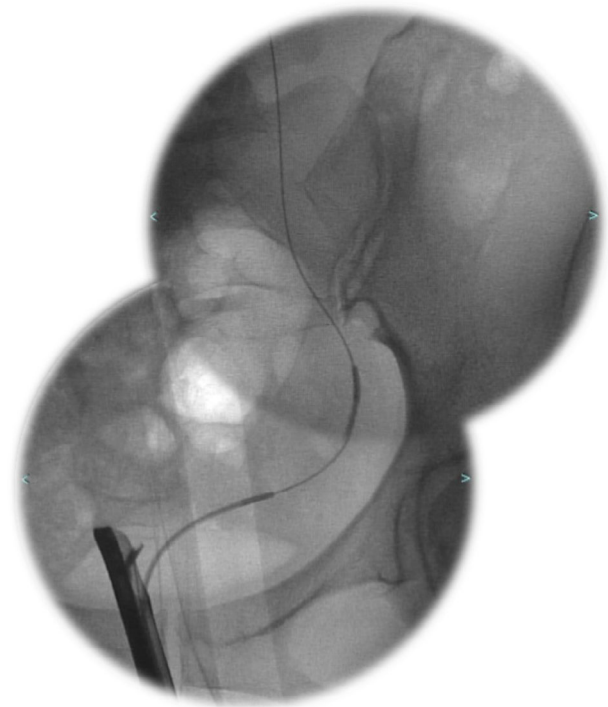


Fig. 3 Fluoroscopic image showed the left ureteral running.

lithotripsy, with setting at 0.2 J and 50 Hz. The procedure was concluded without inserting a double-J ureteral stent and a nephrostomy. The operative time was 55 min.

The patient was discharged on the fifth postoperative day without any complication. A bladder contrast study, performed 2 weeks postoperatively, revealed no evidence of VUR. Abdominal CT, performed 1 month after ultra-mini ECIRS, revealed the absence of residual stones and hydronephrosis. Stone analysis showed the presence of 96% calcium oxalate and 4% calcium phosphate. Follow-up KUB radiology conducted after 6 months, showed no evidence of stone recurrence.

Discussion

The most commonly used surgical method for VUR is Cohen reimplantation. The ureter is tunneled cross-trigonally within the posterior wall of the bladder to exit the contralateral bladder. Thus, achieving ureteric access is difficult in patients with history of Cohen reimplantation. In 2003, Wallis *et al.*² introduced a transurethral approach to the upper urinary tract using a curved catheter and an angled guidewire. In the present case, we decided to place a 6Fr Double J stent preoperatively to assess and dilate the left ureter. Since the course of the intravesical and distal ureters is not straight, it was difficult to insert a straight-type guidewire into the ureter; however, with an angled guidewire, insertion into the ureter was easy, allowing for placement of a ureteral stent.

Reports on the treatment of urinary stones after anti-reflux surgery are limited and there are no established standard treatment guidelines. In endoscopic lithotripsy after anti-reflux surgery, it is important to avoid postoperative

ureteral stricture and recurrence of VUR. In previous reports on endoscopic lithotripsy for urinary stones after Cohen reimplantation, Inoue *et al.*³ performed antegrade URS without preoperative placement of ureteral stent. Lusardi *et al.*⁴ performed URS without preoperative ureteral stent placement or use of UAS. Emiliani *et al.*⁵ performed URS without preoperative ureteral stent placement; however, by inserting a 10/12Fr UAS. The use of a UAS in endoscopic lithotripsy can shorten operation time and enable continuous irrigation to prevent an increase in renal pelvic pressure.^{6,7} However, the use of UAS is associated with possibility of ureteral injury⁸ and ischemia.⁹ The safety of endoscopic lithotripsy using UAS after anti-reflux surgery, remains unknown.

In this case, we chose to perform endoscopic treatment without UAS to prevent ureteral injury. A double-J ureteral stent was inserted preoperatively for the purpose of ureteral dilation. Additionally, based on intraoperative findings, the insertion of a double-J ureteral stent may be necessary. Inserting a double-J ureteral stent carries the risk of urinary tract infection due to vesicoureteral reflux. Therefore, if a double-J ureteral stent is inserted, it should be removed as soon as possible.

Furthermore, the patient desired to conceive soon. During pregnancy, even small residual stones can cause physiological hydronephrosis and the occurrence of stones may affect pregnancy. Therefore, a complete stone-free state is required. To achieve this goal and adequately observe the renal pelvis using both percutaneous and ureteroscopic approaches, we chose ECIRS instead of PCNL.

We considered ECIRS to be a safe approach to achieve a stone-free state, as it allows for easy observation of renal calyces and drainage.

When it comes to performing endoscopic treatment, for urinary tract stones after VUR surgery, there is no conclusive evidence regarding the following aspects: First, the approach method (retrograde, antegrade, and antegrade-retrograde combination); second, the necessity of preoperative ureteral stent insertion; third, the appropriate size of the ureteral stent, and finally, the decision on whether to insert a UAS. Further accumulation of cases is necessary to determine solutions.

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Conclusion

Ultra-mini ECIRS without the use of UAS is an effective method for treating renal stones after Cohen reimplantation.

Acknowledgments

None.

Author contributions

Tetsuo Fukuda: Writing – original draft. Ryo Kawahata: Data curation. Hironao Tajirika: Data curation. Tatsuro Ishikawa: Data curation. Junichi Matsuzaki: Investigation.

Conflict of interest

The authors declare no conflict of interest.

Approval of the research protocol by an Institutional Review Board

Not applicable.

Informed consent

Not applicable.

Registry and the Registration No. of the study/trial

Not applicable.

References

- 1 Chaudhary S, Lee M, Andrews HO, Buchholz NNP. Ureterolithiasis after Cohen re-implantation—case report. *BMC Urol* 2004; **4**: 1–2.
- 2 Wallis MC, Brown DH, Jayanthi VR, Koff SA. A novel technique for ureteral catheterization and/or retrograde ureteroscopy after cross-trigonal ureteral reimplantation. *J Urol* 2003; **170**: 1664–6.
- 3 Inoue T, Yamamichi F, Endo T *et al.* Successful percutaneous flexible ureteroscopy for treatment of distal ureteral stones under modified Valdivia position after Cohen reimplantation. *IJU Case Rep* 2019; **2**: 245–8.
- 4 Lusuardi L, Hruby S, Jeschke S, Zimmermann R, Sieberer M, Janetschek G. A new technique for retrograde flexible ureteroscopy after Cohen cross-trigonal ureteral reimplantation. *Urol Int* 2011; **87**: 260–2.
- 5 Emiliani E, Talso M, Audouin M, Traxer O. Modern flexible ureteroscopy in Cohen cross-trigonal ureteral reimplantations. *J Pediatr Urol* 2017; **13**: 329–31.
- 6 Stern JM, Yiee J, Park S. Safety and efficacy of ureteral access sheaths. *J Endourol* 2007; **21**: 119–23.
- 7 L'esperance JO, Ekeruo WO, Scales CD Jr *et al.* Effect of ureteral access sheath on stone-free rates in patients undergoing ureteroscopic management of renal calculi. *Urology* 2005; **66**: 252–5.
- 8 Traxer O, Thomas A. Prospective evaluation and classification of ureteral wall injuries resulting from insertion of a ureteral access sheath during retrograde intrarenal surgery. *J Urol* 2013; **189**: 580–4.
- 9 Delvecchio FC, Auge BK, Brizuela RM *et al.* Assessment of stricture formation with the ureteral access sheath. *Urology* 2003; **61**: 518–22.