



# Initial experiences of laparoscopic intravesical detrusorraphy using the Politano–Leadbetter technique

H. Choi, J.Y. Park, J.H. Bae

Department of Urology, Korea University Ansan Hospital, Korea University College of Medicine, 123 Jeokgeum-ro, Danwon-gu, Ansan 425-707, South Korea

Correspondence to: J.H. Bae, Department of Urology, Korea University Hospital, Korea University College of Medicine, 123 Jeokgeum-ro, Danwon-gu, Ansan 425-707, South Korea, Tel.: +82 31 412 5190; fax: +82 31 412 5194

[doc71377@hanmail.net](mailto:doc71377@hanmail.net)  
(H. Choi)

[jaeyoung.park@gmail.com](mailto:jaeyoung.park@gmail.com)  
(J.Y. Park)

[doc71377@naver.com](mailto:doc71377@naver.com)  
(J.H. Bae)

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Laparoscopy; Vesicoureteral reflux; Ureteral reimplantation

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## Summary

### Introduction

Minimally invasive laparoscopic surgical procedures are increasingly being used for the management of vesicoureteral reflux.

### Objective

We present our experience of the laparoscopic Politano–Leadbetter technique performed under pneumovesicum conditions, which allows an orthotopic ureteral location after vesicoureteral reflux correction. Our procedure recreates the new ureteric orifice in a normal anatomical position with potential less morbidity and better cosmesis.

### Study design

Our series comprises ten cases. The three 5 mm ports were introduced through bladder wall under cystoscopic vision. A 5-0 monofilament traction suture was used and dissection was carried out. After the ureteral mobilization, the location of the new hiatus was selected in a straight line superior to the original orifice. Dissection of the submucosal tunnel was started from the new hiatus and advanced to the original hiatus and the ureter was gently drawn passed through the tunnel. The ureter was rolled up and muscle fibers were incised until ureter could freely move from the base of the new hiatus. Finally, after spatulation of the terminal part of the ureter, ureterovesical anastomosis was performed with intracorporeal suturing using 5-0 monofilament sutures.

## Results

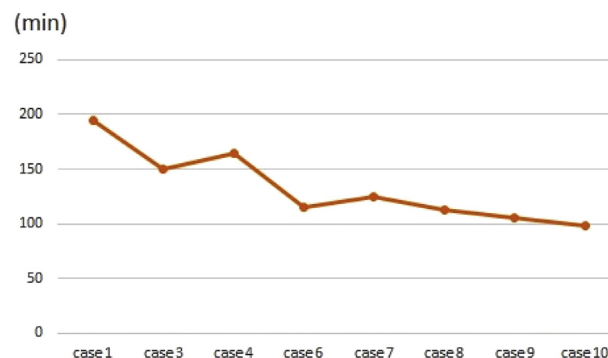
The average operative time was 125 min, with an average of 93 min for unilateral and 133 min for bilateral reimplantation. Blood loss was minimal and drains were used selectively. Removal of urethral catheter was decided empirically after hematuria stopped. Mean catheterization time was 5.1 days. The mean postoperative hospital stay was 6.2 days.

## Discussion

This study had limitations: the small number of cases, follow-up period is relatively short and data on the pre-operative bladder capacity, catheter-related morbidity, pain control and cosmesis are lacking. But most cases showed positive clinical results including acceptable operating time and good resolution rate with minimal complication. Our Politano–Leadbetter transvesicoscopic ureteric reimplantation is safe and useful in the resolution of VUR, even though the laparoscopic ureteric reimplantation is technically demanding even for experienced pediatric surgeons. Considering the main advantages of endoscopic surgery, our new vesicoscopic technique could be an optional treatment to the open reimplantation and has merits because whole the procedure are performed within the bladder, so there is no risk of intraperitoneal organ injury.

## Conclusion

Though the role of this new technique in the treatment of VUR remains to be determined, the technique could be an optional treatment to replace other surgical methods as a less invasive and effective therapeutic method.



Figure

## Introduction

Vesicoureteral reflux (VUR) is the retrograde stream of urine from the bladder to the upper urinary tract. VUR is the most common uropathy that affects children. Compared with children without VUR, those with VUR have a higher rate of pyelonephritis and renal scarring, and subsequent UTI. The actual prevalence of VUR remains unknown because many children are asymptomatic. The prevalence of VUR in normal children has been estimated as 0.4–1.8% [1].

The treatment principle for VUR is to avoid renal damage. Conservative management using antibiotic prophylaxis is generally accepted [2]. This regimen has recently been supplemented with refined endoscopic therapies [3]. Nevertheless, surgical ureteral reimplantation is the primary option in cases of breakthrough infections, reflux nephropathy, or accompanying anomalies, because for definitive treatment of primary VUR, surgery is considered the gold standard. Decisions for surgical repair are individualized and based on patient age, health, reflux grade, clinical course, compliance, renal scarring, and parental preference. In 2005, the pediatric VUR guidelines panel of the American Urological Association (AUA) published recommendations for treatment [2]. Factors included in these recommendations were: patient age at presentation, grade of reflux, unilateral vs bilateral reflux, persistent reflux on follow-up, and presence or absence of renal scarring. In general, surgical intervention was recommended for patients who were older at initial presentation and had dilating, bilateral, or persistent reflux, and renal scarring.

Currently, with the evolution of endoscopic treatment and laparoscopic correction, minimally invasive surgical procedures have been attempted for managing VUR. As a more non-invasive treatment, laparoscopy represents recent advancement. Most transvesicoscopic ureteroneocystostomies are performed using the transtrigonal Cohen technique. The present study tried to overcome some critical limitations of the Cohen technique, and to report on initial experiences with transvesicoscopic ureteroneocystostomy using the Politano–Leadbetter technique, which better allows an orthotopic ureteral location.

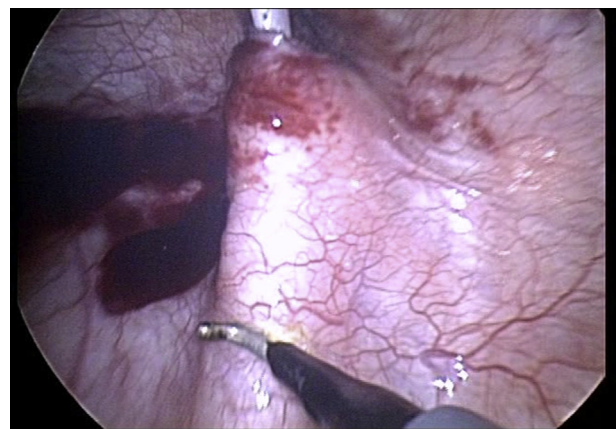
## Patients and methods

Ten children (six girls and four boys) underwent ureteral reimplantation between June 2012 and October 2013 at the present institution. The same surgeon (J.H.B.) performed all of the procedures. Conventional voiding VCUG was used for evaluation. Surgical indications were: persistent infections with medical treatment, significant renal scarring, reflux persistency, complications due to antibiotics, progressive renal functional damage, reflux nephropathy, and preference for surgery. Treatment options, including endoscopic management and open/vesicoscopic reimplantation, were explained to the patient as alternative treatment options. Exclusion criteria were: neurogenic voiding dysfunction; pyeloureteral junction obstruction; previous ureteral surgery, including endoscopic injection treatment; urologic abnormality such as ureteroceles; duplicate ureteric systems; PUV; ectopic ureters; small bladder on

pre-operative VCUG; being <1 year old; and requiring ureteral tapering.

## Surgical procedure

Each patient was placed in the modified lithotomy position with abducted legs. The operation began with a cystoscopic inspection of the bladder in order to determinate the condition of the ureteric orifices. This pneumovesical procedure requires suprapubic introduction of three ports into the bladder: one median for the telescope, and two lateral for the operating instruments. After a small skin incision, a VersaStep 5-mm trocar (Covidien, Norwalk, CT) was intravesically inserted under cystoscopic guidance. The two lateral 5-mm ports were introduced through the anterolateral wall of the bladder under cystoscopic vision. Care was taken not to place them too close to the ureteric orifice so that there was enough working space. A tight tagging suture was placed in the port fixation, and to avoid any further dislodgement, extreme care was made not to pull the trocar by inadvertent instrument working. A 5-mm zero-degree optic camera (Olympus, Winter & Ibe, GmbH) achieved laparoscopic vision. The bladder was emptied and the cystoscope was then removed. Insufflation of the bladder was performed with CO<sub>2</sub> via the dome port, at a pressure of 8–12 mmHg and a flow rate of 2–3 l/min. A 5-0 monofilament traction suture was used, and a circum-scribing incision was made in the bladder mucosa about 1–2 mm from the ureteral orifice. Once the correct plane was entered, dissection was carried out circumferentially, taking care not to damage the blood supply of the ureter with electrocautery. The ureter was mobilized to the peritoneal reflection, and an adequate ureteral length was obtained. After completion of the ureteral mobilization intravesically, the location of the new hiatus was selected in a straight line superior to the original orifice. The actual location was decided by tracing the ureteral course behind the bladder by pulling the ureter (Fig. 1). To create the neohiatus, the detrusor incisions were three to five times the orifice length, so the incision size was 3–4 cm. After the point of the new hiatus was selected, dissection of the



**Figure 1** New hiatus selection in a straight line superior to the original orifice, decided by tracing the ureteral course behind the bladder by pulling the ureter.

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