

# Laparoscopy-assisted tubeless percutaneous nephrolithotomy in previously operated ectopic pelvic kidney with fragmented J–J stent

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Received: 16 February 2009 / Accepted: 18 June 2009 / Published online: 2 July 2009  
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**Abstract** Nephrolithiasis management within an ectopic kidney presents a challenge to the urologists. Several treatment modalities are possible in this group of patients. Although percutaneous nephrolithotomy (PNL) is an accepted treatment modality in anatomically normal kidneys, ectopic pelvic kidneys require a different and more complicated approach for PNL. We recently treated a 24-year-old patient with calculus and an encrusted J–J stent fragment in pelvic ectopic kidney with a previous history of open pyelolithotomy. Laparoscopy-assisted tubeless percutaneous nephrolithotomy was performed. The technique and the patient characteristics are reported.

**Keywords** Tubeless · Laparoscopy assisted · Percutaneous nephrolithotomy · Pelvic kidney · Fragmented J–J stent

## Abbreviations

PNL Percutaneous nephrolithotomy  
KUB Kidneys, ureter and bladder  
IVP Intravenous pyelography  
SWL Shock wave lithotripsy

## Introduction

Percutaneous nephrolithotomy (PNL) has evolved into a highly effective treatment alternative that is commonly used

to treat patients with large or complex upper urinary tract stones. Principally the majority of renal stones can be removed by percutaneous surgery [1]. The injury risk of surrounding abdominal viscera and major vessels makes percutaneous approaches such challenging procedures in pelvic ectopic kidneys. After the first description of laparoscopic guidance by Eshghi et al. [2] several authors reported different techniques for laparoscopically assisted PNL. We recently treated a patient with calculus and an encrusted J–J stent fragment in pelvic ectopic kidney. The technique and the patient characteristics are reported.

## Case report

A 24-year-old man presented with left lower quadrant pain, hematuria and foreign body on urine during micturition. He had a history of open pyelolithotomy and J–J stent implantation in an ectopic pelvic kidney 2 years ago in an outer clinic, but the J–J stent was not extirpated. A kidneys, ureter and bladder (KUB), and intravenous pyelography (IVP) showed an approximately 1 cm calculus and an encrusted J–J stent fragment in a left side ectopic pelvic kidney (Fig. 1). The other kidney was normal. Serum urea and creatinine levels were in normal ranges. Urinalysis and urine culture was normal. Being a minimal invasive treatment modality, the patient was prepped for laparoscopic-assisted percutaneous removal of calculus and fragmented J–J stent.

## Technique

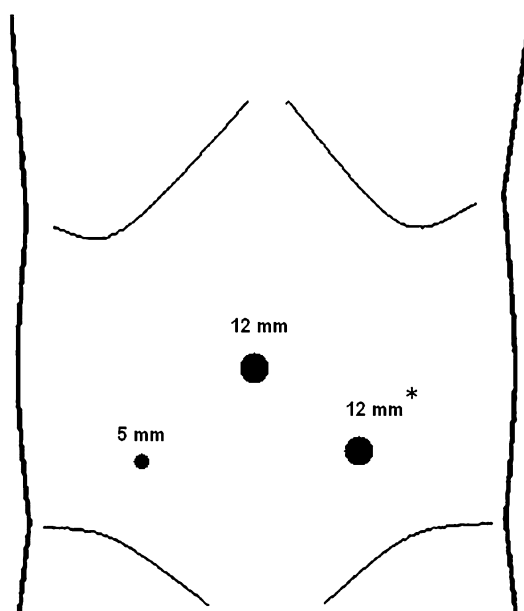
In the lithotomy position, under general anesthesia, a 6 F open-ended ureteral catheter was introduced retrograde into

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**Fig. 1** A Plain X-ray KUB, B IVP showing calculus and encrusted J–J stent fragment in a left ectopic pelvic kidney. White arrows show renal calculus and encrusted J–J stent fragment

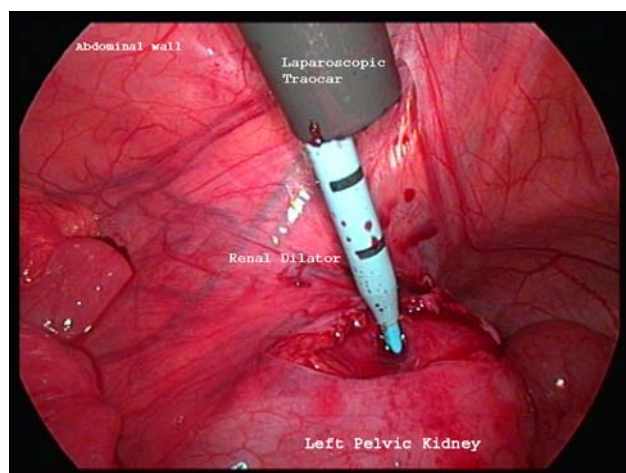


the ectopic kidney. Through a 1.5 cm umbilical incision, a Veress needle was inserted and pneumoperitoneum was created. A 12 mm visualizing laparoscopic trocar (Ethicon) was inserted into the abdominal cavity. Secondary ports, 12 and 5 mm, were inserted, in the left and right iliac fossae, respectively (Fig. 2). On the abdominal wall, left 12 mm trocar was placed in line with the ectopic kidney allowing later punctuation through it. The table tilted 30° Trendelenburg and to the right. Adhesions were encountered between the left pelvic kidney and the sigmoid colon.

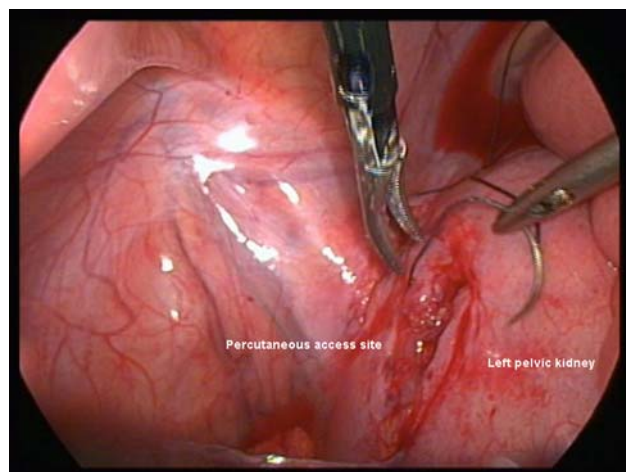


**Fig. 2** Position of the ports. Asterisk Percutaneous access needle was introduced through this left 12 mm trocar

With blunt and sharp dissection, the sigmoid colon was dissected and the anterior surface of the kidney was exposed. Once the kidney exposed laparoscopically, contrast media was injected through the open-ended ureteral catheter and renal access was performed into the upper pole calyx, under fluoroscopic and laparoscopic control through the 12 mm laparoscopic trocar (Fig. 3). A 0.038" guidewire with a J tip was coiled in the caliceal system and the tract was dilated with Amplatz renal dilators. At this stage of the procedure laparoscopy is temporary suspended and the abdomen is evacuated from the carbon dioxide. One important point is that before starting dilation of the nephrostomy tract, gas pressure should be decreased to reduce the distance between the skin and the renal system. This makes it possible to easily reach the whole system. 12 mm laparoscopic trocar was replaced with a 30 F Amplatz sheath with the guidance of 30 F Amplatz renal dilator. A 26 F nephroscope was introduced and the calculus and encrusted J–J stent fragment were removed with a pneumatic/ultrasound lithotripsy device (Swiss Lithoclast Ultra, Boston Scientific) and forceps extraction. Amplatz renal sheath was replaced again with 12 mm laparoscopic trocar and pneumoperitoneum was re-established. Any drainage catheters such as J–J stent or nephrostomy tube were not used. Percutaneous access site was sutured laparoscopically with two interrupted 2-0 polyglactin (Vicryl) sutures (Fig. 4). A 14 F drain was placed in the peritoneal cavity near the kidney. Hemostasis was confirmed and the procedure was finished. Complete clearance was documented with plain X-ray KUB. The abdominal drain was removed on day 2 and the patient was discharged. Patient characteristics and the operative data were summarized in Table 1.



**Fig. 3** Performing renal access through a 12 mm laparoscopic trocar (after the access and the dilation procedure it was replaced with an Amplatz renal sheath) under laparoscopic control



**Fig. 4** Percutaneous access site was sutured laparoscopically with interrupted 2-0 polyglactin sutures

**Table 1** Patient characteristics and the operative data

Patient age (years)	24
Stone localization	Middle calyx
J–J stent localization	Renal pelvis
Stone burden (mm <sup>2</sup> )	100
Overall operative time (min)	120
Time for laparoscopic intervention (min)	45
Time for percutaneous intervention (min)	75
Estimated blood loss (cc)	170
Fluoroscopy time (min)	1.3
Hospital stay (days)	2
Stone analysis	Calcium oxalate

## Discussion

The incidence of pelvic kidney has been estimated to range from 1 in 2,200 to 1 in 3,000 [3]. Nephrolithiasis management within an ectopic kidney presents a challenge to the urologists. Several treatment modalities such as SWL, open surgery, ureteroscopy, percutaneous approaches and laparoscopy are possible procedures in this group of patients [4]. Although PNL is an accepted treatment modality in anatomically normal kidneys, ectopic pelvic kidneys require a different and more complicated approach for PNL. The pelvic kidney is in the retroperitoneum and anterior to the sacrum interposing bowel loops between anterior abdominal wall and pelvic kidney. Thus, a blind percutaneous transperitoneal approach to a pelvic kidney should be avoided, because of the high risk of injuring the bowel [5].

Eshghi et al. [1] first described a laparoscopy-assisted PNL technique for pelvic kidneys. After this several groups and authors have described their techniques. Toth and Hallman [6] first described a transperitoneal laparoscopy-assisted PNL and then, they reported a series of 15 patients successfully treated with transperitoneal laparoscopy-assisted PNL. In their series, they performed the procedure under laparoscopic control with the patient in the Trendelenburg position. They dissected the bowel off until the surface of the kidney became visible. In 1996, Zafar and Lingeman reported on two patients who underwent laparoscopy-assisted PNL, one with a pelvic kidney and one with crossed fused renal ectopia. They performed an antegrade puncture directly into the renal calyx. Zafar et al. [3] modified the laparoscopic technique to include intracorporeal suturing of the nephrotomy site and ureteral stent placement allowing elimination of a transperitoneal nephrostomy tube. Troxel et al. [7] described extraperitoneal laparoscopy-assisted percutaneous approach to access a pelvic kidney. More recently, El-Kappany et al. [8] reported a series of five patients successfully treated with laparoscopy-assisted PNL. In their series, the stone-free rate, mean operative time and mean hospital stay was 80%,  $141 \pm 19$  min and  $2.8 \pm 0.4$  days, respectively. They reported no intraoperative and postoperative complications and conversion to open surgery. As a result, the authors concluded that laparoscopy and nephroscopy for the treatment of stones in pelvic kidneys is feasible, safe and effective.

The posterior approach has also been described for ectopic kidneys. Watterson et al. [9] described the approach through the greater sciatic foramen under fluoroscopic control after careful review of and correlation with CT to optimize tract placement and avoid injury to any intervening bowel, or anomalous or aberrant vessels. Monga et al. removed a calcified stent in a pelvic kidney through the

prone supra-iliac approach. However, postoperative incomplete femoral neuropathy was observed probably due to trauma to dorsal divisions of the lumbar plexus [10]. Matlaga et al. reported a series of eight patients. In six cases PNL was performed as a routine transperitoneal approach but in one patient they created an iatrogenically defect in the iliac bone to access the pelvic kidney and in another case they described a transhepatic track to perform PNL in a pelvic kidney [5].

As mentioned above several authors have described their techniques and especially their usual and some times unusual access points to the abdominal wall and kidney such as, retroperitoneal, transperitoneal, suprailiac, etc. In our case we performed transperitoneal approach to access the kidney. The puncture was made through the 10 mm laparoscopic trocar and no more incision to the abdominal wall require. At the end of the procedure we replaced the renal sheath with laparoscopic trocar, re-insufflated the abdomen and laparoscopically sutured the nephrotomy site. So we did not put either nephrostomy tube or J–J stent.

This case demonstrated the effective use of minimally invasive techniques of laparoscopy and upper tract endourology for the removal of calculus or an encrusted J–J stent fragment from a previously operated pelvic kidney without using any renal drainage catheter. To the best of our knowledge this is the first report of laparoscopy-assisted totally tubeless PNL that was performed to treat an encrusted J–J stent fragment as well as a symptomatic calculus.

## References

1. Pearle MS, Clayman RV (1996) Outcomes and selection of surgical therapies of stones in the kidney and ureter. In: Coe FL, Favus MJ, Pak CYC, Parks JH, Preminger GM (eds) *Kidney stones: medical and surgical management*. Lippincott-Raven, Philadelphia, pp 709–755
2. Eshghi AM, Roth JS, Smith AD (1985) Percutaneous transperitoneal approach to a pelvic kidney for endourological removal of staghorn calculus. *J Urol* 134:525–527
3. Zafar FS, Lingeman JE (1996) Value of laparoscopy in the management of calculi complicating renal malformations. *J Endourol* 10:379–383
4. Stein R, Desai MM (2007) Management of urolithiasis in the congenitally abnormal kidney (horse shoe and ectopic). *Curr Opin Urol* 17:125–131
5. Matlaga BR, Samuel KC, Watkins SL et al (2006) Percutaneous nephrolithotomy for ectopic kidneys: over, around, or through. *Urology* 67:513–517
6. Holman E, Toth C (1998) Laparoscopically assisted percutaneous transperitoneal nephrolithotomy in pelvic dystopic kidneys: experience in 15 successful cases. *J Laparoendosc Adv Surg Tech A* 8:431–435
7. Troxel SA, Low RK, Das S (2002) Extraperitoneal laparoscopy-assisted percutaneous nephrolithotomy in a left pelvic kidney. *J Endourol* 16:655–657
8. El-Kappany HA, El-Nahas AR, Shoma AM, El-Tabey NA, Eraky I, El-Kenawy MR (2007) Combination of laparoscopy and nephroscopy for treatment of stones in pelvic ectopic kidneys. *J Endourol* 21(10):1131–1136
9. Watterson JD, Cook A, Sahajpal R, Bennett J, Denstedt JD (2001) Percutaneous nephrolithotomy of a pelvic kidney: a posterior approach through the greater sciatic foramen. *J Urol* 166:209–210
10. Monga M, Castaneda-Zuniga WR, Thomas R (1995) Femoral neuropathy following percutaneous nephrolithotomy of a pelvic kidney. *Urology* 45:1059–1061