Case Report

Microperc for the management of renal calculi in pelvic ectopic kidneys

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ABSTRACT

Management of stone disease in an ectopic kidney is challenging. Laparoscopy or ultrasound guided percutaneous nephrolithotomy and retrograde intra-renal surgery are the preferred techniques for these stones. We performed ultrasound guided microperc using a 16 G needle for the management of renal calculi in pelvic ectopic kidneys in two patients. There was no intraoperative or post-operative complication. Both patients had complete stone clearance and were discharged on the first post-operative day. Ultrasound guided microperc is a safe and effective option for the management of small renal calculi in pelvic ectopic kidneys.

Key words: Ectopic kidney, microperc, renal calculi

INTRODUCTION

Ectopic kidney is a relatively rare renal anomaly However, an endourologist does encounter stone disease in an ectopic kidney occasionally. Factors such as anomalous blood vessels and tortuous ureter with high insertion can lead to poor drainage and predisposition to the formation of renal calculi in these patients.[1] The common management option for such stones is laparoscopy or ultrasound guided percutaneous nephrolithotomy (PCNL).[2,3] We report our experience with the use the recently described micro-PCNL or "microperc" for two such cases.[4]

CASE REPORT

Two male patients, aged 57 and 60 years respectively, presented to us with calculi in ectopic pelvic kidneys. The first patient had undergone a flexible ureterorenoscopy elsewhere during which the stone could not be reached due to difficult angulation and inflamed tissue leading to poor vision. Computed tomography urogram revealed an ectopic malrotated left kidney lying over the sacrum. There was a 13 mm × 11 mm sized calculus in the renal pelvis [Figure 1a and b]. In the second patient, computed tomography urogram revealed a normal right kidney and an ectopic malrotated left kidney lying over the sacrum. There was an 18 mm × 17 mm sized calculus (1232 HU) in the pelvis and a 5 mm × 4 mm sized calculus (423 HU) in the lower calyx of the ectopic kidney [Figure 1c and d].

Both procedures were performed under general anesthesia. In lithotomy position, ureteric catheterization was carried out under cystoscopic guidance using 7 Fr ureteric catheters over a 0.035 inch glidewire (Terumo, Tokyo, Japan). The position was changed to supine-oblique with a sandbag under the ipsilateral hemipelvis to move the overlying bowel away from the kidney. An ultrasound probe was pressed against the anterior abdominal wall to displace the bowel away from the line of access. Further, colour Doppler was used to rule out any significant blood vessel in the path of needle puncture. The calyx in line with the calculus was punctured using a 16 G needle. Appropriate access was confirmed by instillation of contrast into the pelvicalyceal system under fluoroscopy. Three-way connector was attached to the needle, allowing saline irrigation, passage of a 0.9 mm flexible microperc telescope, and a 272 μm holmium: yttrium aluminum garnet (Ho:YAG) laser fiber [Figure 2]. The stones were completely fragmented to dust with the laser. An X-ray and ultrasound was obtained on the first post-operative day to document stone clearance and to rule out any fluid collection. The urethral catheter was

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Quick Response Code:

Website: www.indianjurol.com

DOI: 10.4103/0970-1591.117267

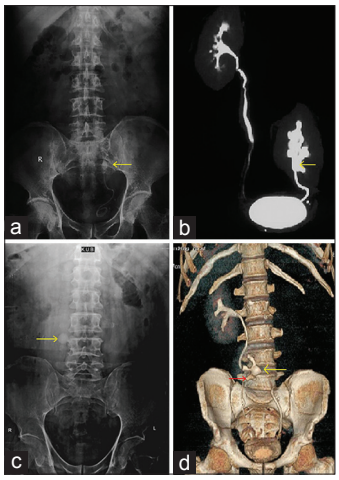

Figure 1: (a) X-ray KUB showing renal calculus in pelvis of pelvic ectopic kidney with double J stent *in situ*, (b) Computed tomography urogram showing the pelvicalyceal system anatomy, (c) X-ray KUB showing renal calculus (yellow arrow) in ectopic kidney, (d) Computed tomography urogram showing the pelvicalyceal system anatomy (location of pelvic stone-yellow arrow; location of lower calyceal stone-red arrow)

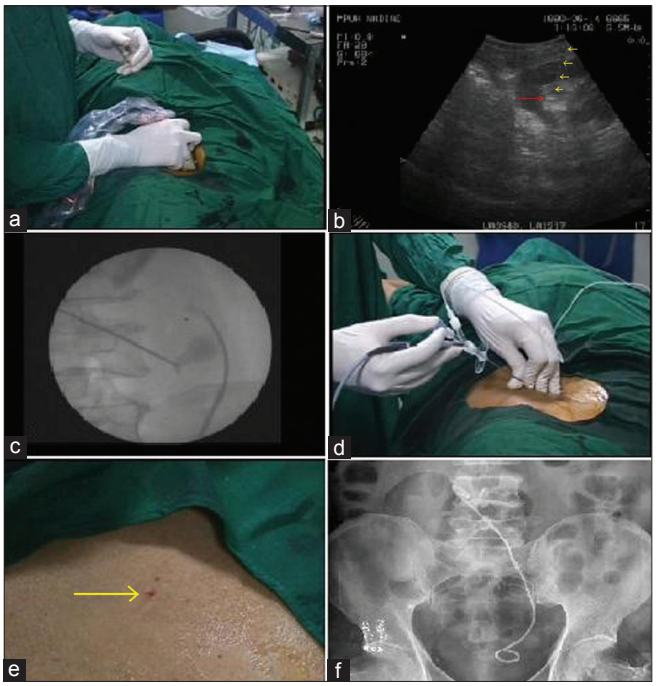

Figure 2: (a) Surface view of patient position and ultrasound guided percutaneous renal access, (b) Intraoperative ultrasonography picture showing entry of puncture needle (yellow arrows) into lower calyx containing calculus (red arrow), (c) Confirmation of access into lower calyx by antegrade contrast study to delineate pelvicalyceal system, (d) Intraoperative surface view showing microperc instruments, (e) Puncture site at the end of the procedure (yellow arrow), (f) Post-operative X-ray KUB showing complete clearance

removed on the first post-operative day and the patient was discharged.

Operating times were 30 and 35 min respectively. In the first patient, ureteric catheter was left *in situ* for 1 day. In the second patient, ureteric catheter was replaced by a double-J stent at the end of the procedure. There was no intraoperative or post-operative complication. Visual analog pain scores (1-10 scale) on first post-operative day were two and three respectively. Analgesic requirement was 50 mg tramadol for both the patients. Hemoglobin drop was 0.5 and 0.2 g/dl respectively. First post-operative day and 1 month follow-up X-ray and ultrasound KUB revealed complete stone clearance and no evidence of fluid collection in the abdomen.

DISCUSSION

Options for managing small renal calculi in pelvic ectopic kidney are shock wave lithotripsy (SWL), retrograde intrarenal surgery (RIRS), ultrasound or laparoscopy guided PCNL. Since these kidneys are surrounded by bowel and bone, the efficiency of SWL is low. Moreover, the clearance of fragmented stones is also impaired due to high insertion of ureter and impaired pyeloureteral motility due to surrounding fibrous bands.[1] RIRS can be technically demanding due to abnormal and tortuous course of the ureter of a pelvic kidney.[1] This was exemplified by our first patient in whom the stone could not be reached with flexible ureteroscope and the procedure had to be abandoned.

The potential hazards in percutaneous access in an ectopic kidney are: (1) Risk of injury to surrounding bowel, particularly if track dilatation is carried out through the bowel, (2) abnormal vasculature resulting in bleeding from tract dilatation and (3) spillage of fluid into peritoneal cavity. Small gauge needle puncture has less potential for morbidity and serious consequences. Microperc is a minimally invasive form of PCNL in which percutaneous renal access and stone fragmentation are achieved in a single-step using a 16 G needle. Since dilatation is not performed, potential hazards associated with it are avoided. Fluid collection is less likely during puncture and at the end of the procedure since the needle puncture site closes quickly. Both our patients had rapid post-operative recovery, probably due to lack of fluid spillage and hence no paralytic ileus. Though laparoscopic guidance has been advocated for percutaneous access of an ectopic kidney, in experienced hands, ultrasound guidance can provide a safe entry into the appropriate calyx.[3] Appropriate patient positioning to move bowel away from the kidney, placing a sand bag to push the kidney towards the anterior abdominal wall and compression with the ultrasound transducer allow safe access into the kidney. Further, the use of colour Doppler rules out any significant blood vessel along the path of needle puncture.

The hemoglobin drop in both of our patients was minimal, supporting the safety of this procedure. In laparoscopy guided PCNL, an abdominal drain may need to be left *in situ* for a prolonged period because of persistent urinary leakage.[5] We did not observe any fluid collection inside the peritoneal cavity post-operatively. The average hospital stay in a series of 15 patients who underwent laparoscopy guided PCNL was 4.8 days (4-11 days).[2] The patients in that

series had sequential removal of nephrostomy tube, urethral catheter and abdominal drain, which lead to the prolonged post-operative stay.[2]

Thus, ultrasound guided microperc is a safe and efficient technique in the management of small renal calculi in ectopic kidneys and it is a minimally invasive procedure with short hospital stay.

REFERENCES

1. Cinman NM, Okeke Z, Smith AD. Pelvic kidney: Associated diseases and treatment. J Endourol 2007;21:836-42.
2. Holman E, Tóth C. Laparoscopically assisted percutaneous transperitoneal nephrolithotomy in pelvic dystopic kidneys: Experience in 15 successful cases. J Laparoendosc Adv Surg Tech A 1998;8:431-5.
3. Desai MR, Jasani A. Percutaneous nephrolithotripsy in ectopic kidneys. J Endourol 2000;14:289-92.
4. Desai MR, Sharma R, Mishra S, Sabnis RB, Stief C, Bader M. Single-step percutaneous nephrolithotomy (microperc): The initial clinical report. J Urol 2011;186:140-5.
5. Mousavi-Bahar SH, Amir-Zargar MA, Gholamrezaie HR. Laparoscopic assisted percutaneous nephrolithotomy in ectopic pelvic kidneys. Int J Urol 2008;15:276-8.

How to cite this article: Ganesamoni R, Sabnis RB, Mishra S, Desai MR. Microperc for the management of renal calculi in pelvic ectopic kidneys. Indian J Urol 2013;29:257-9.

Source of Support: Nil, **Conflict of Interest:** None declared.