

CASE REPORT

Laparoscopic Assisted Transperitoneal Percutaneous Nephrolithotomy for Stones in Pelvic Kidney

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Abstract:

The most common form of renal ectopy is pelvic kidney and treating stone disease and achieving complete stone clearance in such anatomical anomaly is difficult. We report a case of patient with pain in left iliac fossa and evaluation revealed left pelvic kidney with multiple renal calculi. We describe the successful management of calculi with laparoscopic assisted Percutaneous Nephrolithotomy (PCNL) in an ectopic pelvic kidney, stressing that this method is minimally invasive therapeutic option in ectopic nephrolithiasis requiring precision and expertise as it is a technically challenging and complex endourological procedure and rarely performed.

Keywords: Pelvic Ectopic Kidney, Laproscopic Assisted Percutaneous Nephrolithotomy, Nephrolithiasis

Introduction:

Though, the treatment of urolithiasis has undergone a great advance with the adventment of Extracorporeal Shock Wave Lithotripsy (ESWL) and endourology, the presence of anatomical anomalies, such as the pelvic kidney, imposes limitations to such therapeutic procedures [1]. The pelvic kidney is the most common form of renal ectopy. Its incidence is estimated from 1 in 2,200 to 1 in 3,000. The association with lithiasis is small when there is no impairment of urinary drainage. Renal lithiasis in pelvic kidney can be managed by means of open surgery, ESWL or percutaneous nephrolithotomy. Open surgery

presents higher morbidity, is less aesthetic due to the incision, and causes more pain post-operatively. Extracorporeal lithotripsy results in only 54% stone clearance in such cases [2]. Percutaneous surgery is challenging and not conducted in conventional way. It must be performed by anterior abdominal approach because the pelvic bone structures hinder the posterior access. Additionally, there is a need for renal puncture and dilation of the tract under direct viewing with an aid of video laparoscopy. Thus, the puncture needle is oriented under direct viewing avoiding any damage to the abdominal organs or major vessels [3]. We describe a successful management through laparoscopic assisted Percutaneous Nephrolithotomy (PCNL) in an ectopic pelvic kidney.

Case Report:

A 50 year old male patient presented with complains of pain in left iliac fossa since one year. General condition of patient was fair. Abdominal ultrasonography suggested left pelvic kidney with multiple calculi and moderate hydronephrosis. Computed tomography-(KUB) (plain and contrast) suggested ectopic left kidney in left pelvis with Two calculi seen in left renal pelvis, largest one measuring about 14x12 mm and the other one calculus measuring 11 x10 mm (Fig. 1 and 2). Patient planned and underwent left uretero-renoscopic lithotripsy with DJ stenting,

but stone clearance was not achieved. As patient had failed left uretero-renaloscopic lithotripsy, a Laparoscopic Assisted Percutaneous Nephrolithotomy (LAPNL) was planned.

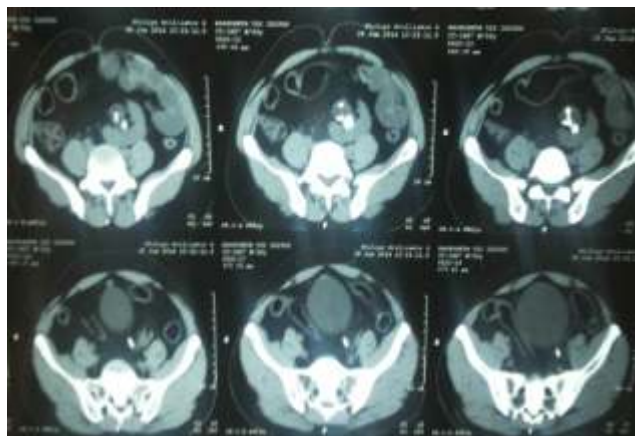


Fig.1: CT KUB Plain - Left Pelvic Kidney with Multiple Calculi

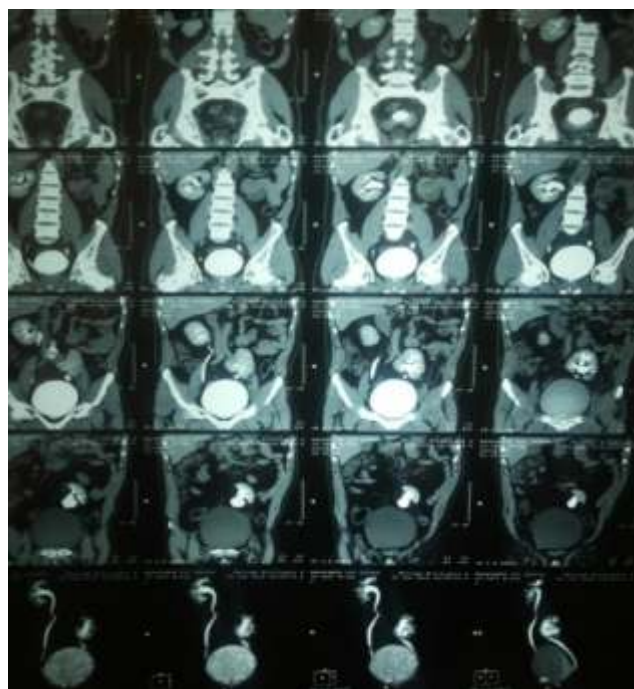


Fig. 2: CT KUB Contrast- Left Functioning Pelvic Kidney

Technique:

The patient was put in the lithotomy position and a retrograde ureteric catheter was inserted cystoscopically under image intensification. This was used to delineate the pelvi-calyceal system with radio-contrast material. Next the patient was placed supine and given slight right oblique position. Through Hassan open technique a 10mm laparoscopy port was introduced in the umbilical region under direct vision. CO₂ insufflation at 14 mm Hg was started. One 5 mm port was inserted in the left mid clavicular line and another 5 mm port in the left iliac fossa. Small intestines over laying the pelvic kidney was displayed cephalad using the laparoscopic forceps. Left side posterior peritoneum dissected and reflected towards right side using laparoscopic scissors and forceps. Once peritoneal fold reflected, left kidney was identified as a retroperitoneal pelvic organ. Radio-contrast material injected through already placed ureteric catheter, which delineated pelvicalyceal anatomy of left kidney. With the aid of image intensifier an 18 gauge Initial Puncture (I.P.) needle was inserted into the abdominal wall directly overlying the kidney. The intra-abdominal course of the needle was guided by the video laparoscopy and a forceps in the working port. Under laparoscopic vision the needle was introduced into the kidney. The site of puncture was in a dilated calyx of upper pole of left pelvic kidney, filled with radio contrast and visible on the fluoroscope. After aspiration of urine from the IP needle a guide wire was inserted and the tract was serially dilated over the guide wire till 27 F using telescopic metal dilators. Finally a 30 F amplatz sheath was passed over the dilators. The dilators along with the guide wire were removed. This allowed insertion of a 26 F nephroscope (Storz™) in the amplatz sheath. After performing nephroscopy, the stone was identified, and

fragmented using pneumatic lithotripter. The fragments were removed using forceps. Finally the kidney was inspected for residual stones by direct nephroscopy aided by fluoroscopy. Abdominal drain was placed and fixed. The abdomen was deflated, port sites inspected for bleeding and closed. Post-operative day X-ray KUB showed complete stone clearance (Fig. 3). Post operative period was uneventful, abdominal drain was removed and patient was subsequently discharged on 4th post operative day.



**Fig. 3: Postoperative X-ray KUB:
Complete Stone Clearance
with DJ Stent *in situ***

Discussion:

The pelvic kidney is the most common form of renal ectopy. PCNL is a challenging technique in pelvic kidneys. The abnormal renal orientation, the unusual and unpredictable blood supply and the overlying loops of intestine are significant difficulties. The best treatment for stones in pelvic ectopic kidney has not yet been clearly established. Video laparoscopy, in the case described above, enabled percutaneous surgery

avoiding the risk of damage to the intestine that could be in line of the percutaneous tract. Although percutaneous nephrolithotomy is a well established endourological modality for the management of calculi in the normally placed kidney, it is not easy to apply it in the management of calculi in pelvic ectopic kidneys. Maheshwari *et al* [4] have described three patients with large calculi in pelvic ectopic kidneys who subsequently underwent laparoscopically guided transperitoneal percutaneous nephrolithotomy, all with successful outcome. In all patients, complete stone clearance was achieved in a single operation with no intraoperative or postoperative morbidity. They remained asymptomatic and recurrence-free at a follow-up ranging from 2 to 38 months. Laparoscopic guidance allows the transperitoneal route to be used safely for percutaneous nephrolithotomy in patients with calculi in pelvic ectopic kidneys. In another case report of a 35-year-old man [5] with a left ectopic pelvic kidney and a prior history of open pyelolithotomy presented with recurrent multiple stones in the pelvic kidney. Complete clearance of calculi was achieved by laparoscopy-assisted PCNL.

Conclusion:

Percutaneous nephrolithotomy is a well established endourological modality for the management of calculi in the normally placed kidney, it is not easy to apply in the management of calculi in pelvic ectopic kidneys because of difficulties posed by abnormal renal orientation, the unusual and unpredictable blood supply and the overlying loops of intestines. Laproscopic assisted transperitoneal PCNL could be a safe, feasible and valid minimally invasive management option for this uncommon but challenging urological condition

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