Case Report

Laparoscopic Assisted Percutaneous Nephrolithotomy (PCNL) in Ectopic Pelvic Kidney

Shahid Aquil, Majid Rana, Zafar Zaidi
The Kidney Centre Postgraduate Training Institute, Karachi.

Abstract

We report the case of a patient with pain and an abdominal palpable mass whose tests showed a right pelvic kidney with a 4-cm stone in the renal pelvis. We describe the successful management through laparoscopic assisted percutaneous nephrolithotomy (PCNL) in ectopic pelvic kidney, stressing that this method is a minimally invasive therapeutic option in such cases.

Introduction

The treatment of renal lithiasis 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 in casuistry from necropsies. The association with lithiasis is small when there is no impairment of urinary drainage.[2]

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 has also been proposed, but it is not conducted in a conventional way.[3] It must be performed by anterior abdominal approach because the pelvic bone structures hinder the posterior access. Additionally, there is the need for renal puncture and dilation of the tract under direct viewing with the aid of videolaparoscopy. Thus, the puncture needle is oriented under direct viewing avoiding any damage to abdominal organs or major vessels.[3]

We describe the successful management through laparoscopic assisted percutaneous nephrolithotomy (PCNL) in an ectopic pelvic kidney.

Case Report

A 22years old female presented with complaints of abdominal pain for several months and palpable abdominal mass. Abdominal ultrasonography suggested right pelvic kidney with a 4-cm stone in renal pelvis. Excretory urography demonstrated a functional right pelvic kidney while the contralateral kidney was normal in function and position(Figure 1).

Two surgical teams were employed each using separate endovision camera and monitor. The patient was put in lithotomy position and a retrograde ureteric catheter was inserted cystoscopically under image intensification. This was used to delineate the pelvicalyceal system with radiocontrast (urograffin). Next the patient was placed supine and through Hassan open technique a 10mm laproscopy port was introduced in the umbilical region

Figure 1. Intravenous Pyelography.

Figure 2. Post Operative X-ray.

under direct vision. CO2 insufflation at 14 mm Hg was started. One 5 mm ports was inserted in the left mid clavicular line and another 5 mm port in the left iliac fossa.

Kidney was identified as a retroperitoneal pelvic organ. Small intestines over lying the pelvic kidney were displayed cephalad using the laproscopic forceps. Posterior peritoneum over the pelvic kidney was dissected using laproscopic scissors and forceps. Once the renal capsule was identified, contrast was injected via the already placed ureteric stent. This allowed the hydronephrotic kidney to dilate up. With the aid of image intensifier an 18 gauge spinal needle was inserted into the abdominal wall directly overlying the kidney. The intra abdominal course of the needle was guided by the video laproscopy and a forceps in the working port. Under laproscopic vision the needle was introduced into the kidney. The site of puncture was in a dilated calyx now filled with radio contract and visible on the fluoroscope. After aspiration of urine from the spinal 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 (Stortz ™) in the amplatz sheath. During this entire period the renal puncture site was constantly monitored by the laproscopist on a separate video monitor. Laproscopic forceps were used to assist in keeping the dilators from slipping out of the kidney.

Figure 3. Antegrade Nephrostogram.

After performing nephroscopy, the stone was identified, and fragmented using pneumatic lithoclast (swiss lithoclast TM). The fragments were removed using forceps. Finally the kidney was inspected for residual stones by direct nephroscopy aided by fluoroscopy. The tract was drained using a nephrostomy tube.

Urine/irrigation fluid spillage was minimal. It was aspirated using laproscopic suction device. At conclusion a suction catheter was placed in the true pelvis. This was introduced through a laproscopy working port and directed into place using a laproscopy forcep. The abdomen was deflated, port sites inspected for bleeding and closed.

The surgical time was 100 minutes. On first post-operative day x-ray KUB showed near complete clearance with small residual fragment (Figure 2). On the fifth post operative day, antegrade nephrostogram was performed. This confirmed absence of extravasation and was followed by nephrostomy tube removal (Figure 3). The puncture site remained dry and the patient was discharged subsequently on sixth postoperative day.

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. Videolaparoscopy, 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 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.

We believe laproscopic assisted transperitoneal PCNL to be a safe, feasible and valid minimally invasive management option for this uncommon but challenging urological condition.

References

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