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Case Report

Single puncture percutaneous nephrolithotomy for large staghorn calculus: experience at a tertiary care center

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ABSTRACT

Percutaneous nephrolithotomy (PCNL) is recommended procedure for stones greater than 2 cm This procedure is being used commonly by all urologists worldwide. With increasing using of imaging studies, the incidence of large staghorn calculus has been consistently decreasing because most of the stones are being detected while they are still small. In this case report we are presenting a case of a large staghorn calculus of size 6.7×5.2 cm which was completely cleared by PCNL with a need for relook procedure.

Keywords: PCNL, Staghorn, Calculus

INTRODUCTION

Percutaneous nephrolithotomy (PCNL) was first performed by Fernstrom and Johannson in 1970. Now it is being increasingly used for management of renal calculus. As per the latest AUA guidelines it is the recommended procedure for stones greater than 2 cm and lower pole stones greater than 10 mm.[1] It is a minimally invasive procedure allowing removal of large or complicated stones. It has several advantages, avoiding the morbidities of open procedures, including decreased operative time and hospitalization, lower complication rates with stone clearance rates of more than 90%.[2]

Staghorn calculi comprise a unique subset of complex kidney stone disease. Despite recent refinements to the technique and instrumentation of PCNL for the treatment of staghorn calculi, these stones are still a troublesome challenge for endourologists. These are associated with a higher rate of perioperative complications and lower stone free rate than that for non-staghorn disease. The various complications which can be associated with PCNL include disruption of pelvicalyceal system, bowel perforation, and hemorrhage requiring transfusion or angioembolization.[3] A study by the clinical research office of the endourological society (CROES) showed that stone free rate after PCNL in staghorn patients is approximately 56.9% compared with 82.5% for non-staghorn patients.[4]

Here, we are presenting a case of a very large staghorn calculus which was successfully managed in single sitting by single puncture standard PCNL.

CASE REPORT

A 48-year-old male patient presented with intermittent, non-radiating, dull aching left loin pain for the past 2 years. He was hypertensive, on single antihypertensive medication, non-diabetic and euthyroid. Patient had a history of Arnold Chiari malformation and syringomyelia with quadriparesis 7 years back, was managed by Foramen magnum decompression with theco-peritoneal shunt and postoperatively recovered. There was no other significant past or family history. Examination revealed tenderness on deep palpation of his left renal angle. On investigation, hemoglobin was 14.4 g/dL, total leukocyte count of 8000/µL, and serum creatinine levels of 0.94 mg/dl. Complete urine examination showed WBCs of 2-4/hpf and RBCs of 0-1 /hpf. Urine culture showed no

growth of bacteria. Ultrasonography of abdomen and pelvis revealed left 5 cm calculus with mild hydronephrosis. CT KUB was done which showed a large 6×5×3 cm left renal calculus in renal pelvis and calyces (Staghorn calculus) (Figure 1). Excretory urography showed bilateral excretion of contrast with 6.7×5.2cm radio opaque density occupying whole PCS in left renal fossa with no hydroureteronephrosis seen (Figure 2).

Patient underwent standard PCNL under general anesthesia. A single lower calyceal puncture was done with dilatation of tract upto 26Fr using serial Amplatz dilators and 26 Fr sheath was placed (Figure 3). With 18.5 dresden nephroscope stone was fragmented and complete clearence achieved. Total operative time was 2 hours 30 minutes. The 5 Fr/26 cm DJ stent was placed antegradely and 16Fr nephrostomy tube was kept. Postoperative period was uneventful. Post operative X ray KUB and ultrasnogram done on Day 2 showing no residual fragments (Figure 4). Nephrostomy tube was removed on postoperative day 4 and periurethral catheter was removed on day 5. There was no PCN site soakage. Patient was discharged on day 5.

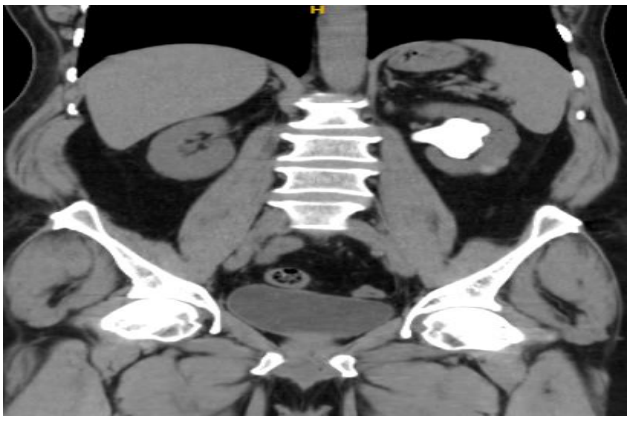

Figure 1: Non contrast CT KUB showing large left staghorn calculus.

Figure 2: Excretory urography.

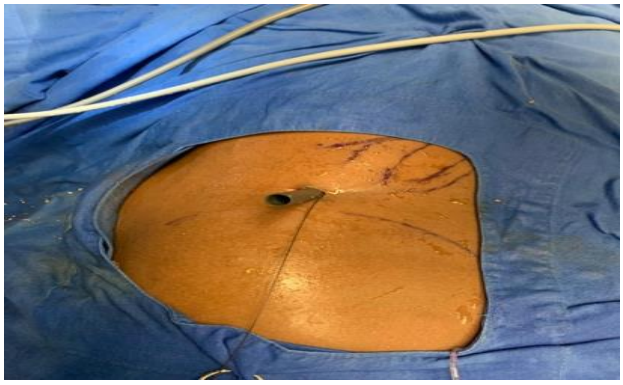

Figure 3: Single tract puncture with sheath of 26 Fr.

Figure 4: Postoperative KUB showing complete clearance.

DISCUSSION

There is lot of literature available on the use of PCNL in patients with renal calculi size more than 2-3 cm. However, limited data are available for calculi which have diameters >3 cm. We report a case of large staghorn renal calculus of size 6×5×3 cm which was managed by single tract puncture without a relook procedure.

For a large stone burden, various treatment options are available including open/laparoscopic surgery, PCNL, and combination multimodality treatment. As we have gained experience and with improvisation of instrumentation, it has become possible to perform PCNL, for almost all stones, irrespective of size and complexity, with a success rate comparable with complicated open procedures.[5] In a meta-analysis of five randomized and nine nonrandomized studies, which included 901 patients comparison of laparoscopic pyelolithotomy and PCNL was done and it was found that though laparoscopic pyelolithotomy is a safe and effective in the treatment of large renal calculi, PCNL is still suitable for most cases and laparoscopic pyelolithotomy can be used as an alternative management procedure with good selection of cases.[6]

A trend has emerged towards the use of percutaneous monotherapy using multiple tracts as the preferred treatment option for most staghorn or complex calculi, but using multiple puncture is not without concern. Creating multiple percutaneous tracts is the potential risks of greater bleeding and higher complication rates compared with the single-tract approach.[7] Moreover in a meta-analysis done by Jiao et al comparing results of single puncture versus multiple puncture PCNL, it was seen that compared with multiple tract PCNL, single tract PCNL not only yields similarly high stone free rate but also is associated with less blood loss, fewer blood transfusions, and fewer pulmonary complications without an increase in other complications.8 It true especially in our case where there is a theco-peritoneal shunt.

Our patient had a very large stone burden of 6×5×3 cm which was successfully managed by single tract PCNL with complete clearance of stones, as confirmed by postoperative imaging studies. To best of our knowledge, the largest clearance achieved by single puncture PCNL is by Gavande et al who cleared a stone of size 10×7 cm.[9]

CONCLUSION

In conclusion, though very large renal calculi are rarely seen in present times, still in rare cases who present, our case demonstrates the usefulness of single tract PCNL in the management of large complex renal calculi especially in case where laparoscopy may not be feasible.

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