

Day Care Percutaneous Renal Surgery - Is This Viable?

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Summary

Pros and cons of Percutaneous Nephrolithotripsy (PCNL) versus Extracorporeal Shockwave Lithotripsy (ESWL) have often been highlighted when one discusses on the management of renal stones. An oft quoted point is that PCNL entails a prolonged hospital stay whereas ESWL sessions are day surgical in nature. However, PCNL has superior stone clearance rate as compared to ESWL especially for lower pole stones. In addition, PCNL is more suitable for large bulk stones and when ancillary procedures are required e.g. endopyelotomy. The first 50 cases of successful tubeless PCNL were reported by Bellman et al in 1997. The remarkable recovery of patients in their series encouraged them to employ this technique as their technique of choice for the majority of their cases¹. A similar technique was employed on endopyelotomy by Liang *et al*² and they concluded that this was a safe, less morbid and effective technique. We report our first case of tubeless PCNL.

Key Words: Daycare surgery, Percutaneous, Nephrolithoripsy

Introduction

PCNL has long over taken open surgery as the technique of choice in renal stone surgery. The challenge from ESWL is obvious as ESWL can be done as an outpatient procedure. Debates have often centred on the pros and cons of each technique. Stones larger than 2cm, multiple stones, lower pole stones and requirement for ancillary procedures e.g. endopyelotomy, might tip one surgeon towards PCNL. However, PCNL entails a prolonged stay of up to 4.6 days¹. This is due to the practice of routine placement of tube after completing a percutaneous procedure. The purpose of the tube is thought to allow renal healing, avoid urinary extravasation, aid in hemostasis, and provide for access when postoperative endoscopic procedures are

anticipated. This has been challenged by Bellman et al after reporting the first 50 cases of tubeless PCNL with resounding success in outcome. Similar technique was employed on endopyelotomy by Liang *et al*² and they concluded that this was a safe, less morbid and effective technique. We embarked on our first tubeless PCNL in Malaysia and this paper serves to document the procedure and put forward the advantages of this procedure.

Case Report

A 58-year old man presented with multiple left renal stones: 2.5cm and 1.5cm and multiple lower pole stones (each one less than 0.5cm) and moderate hydronephrosis of the left kidney. He

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was a diabetic and a hepatitis B carrier. Clinical examination was unremarkable. An informed consent was taken for left PCNL.

The patient was prepared as for routine PCNL. He underwent general anesthesia and an intravenous cephalosporin was administered at induction. In the lithotomy position, an angiocatheter was placed in the upper pole of the left kidney. The patient was then repositioned prone. A subcostal skin puncture was made to gain access to the upper pole. A Nephromax™ balloon was used to dilate the tract to 30F and a 30F Amplatz™ sheath inserted into the upper pole.

Nephroscopy was performed and stone was fragmented with an EMS™ lithotripter. Stones in all the calyceal system were removed. A 6F 24cm Double-J stent was inserted anterogradely. The Amplatz™ sheath was gradually removed and tract inspected with the nephroscope™ with the guidewire still in the pelvis. There was a wait of 10 minutes before the skin was stitched with silk and guidewire removed. The procedure time from the time of puncture to withdrawal of scope was 50 minutes. An indwelling bladder catheter was left in situ.

Four hours post-operatively, patient was reviewed in the ward and he was noted to be sitting up in the bed. His visual analogue pain score was 0/10, hence no analgesia was required. He was discharged the following day, less than 24 hours post-op after a KUB X-ray revealed no residual stones. A week later the stent was removed under local anaesthesia. He had no fever or pain over the puncture site while recuperating at home. No urinoma was detected on ultrasound done on the day of stent removal.

Discussion

Nephrostomy tube insertion has been routine for all cases of percutaneous renal surgery. It is thought to allow the renal puncture to heal, provides for proper hemostasis, avoids urinary extravasation and allow access for immediate post-operative procedures.

The practice of inserting a separate lower pole nephrostomy tube with a smaller 10F tube as compared to a 24F Malecot catheter at its original site of puncture in upper pole in exchange for better post-operative comfort for the patient, implies that a nephrostomy tube need not be put at the site of puncture for healing. As long as proper drainage is provided, the puncture will heal. Thus in tubeless PCNL, this role is undertaken by the Double-J stent.

The practice of an additional lower pole puncture, though giving more comfort to the patient, is an added procedure and thus a higher chance for complications.

The advantage of tubeless PCNL is obvious. Pain is minimal and time to mobilisation is very early. Most patients with a Malecot catheter in the upper pole complain of pain and discomfort and are afraid to take deep breaths. Mobilisation is also delayed. (PCNL patients are normally discharged usually discharged on post-operative Day 2 or 3)

There additional advantages of this technique which is pertinent to our case and setting include:-

1. As patient is an infectious patient, there is an absence of a route for peritubal extravasation of infective fluid.
2. In addition no foreign body in the pelvis is in contact with the exterior thus minimizing the chance of infection.
3. Removal of the scope from the dilated tract would allow pneumothorax to be detected instantly.

Case selection however is of utmost importance. In the study by Bellman et al, they excluded all cases that had lasted more than 2 hours, needed more than 2 punctures, significant residual stone burden, significant post-operative bleeding and when secondary procedure may be indicated¹.

The use of the balloon dilator as compared to the sequential Amplatz™ dilator will greatly improve the outcome of surgery as sequential Amplatz™

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dilator has been associated with a significantly higher post-operative hemorrhage and transfusion³ rates.

Cost savings are obvious, resulting from shorter hospitalisation stay; decreased analgesic requirement, cost of the nephrostomy tube and a single session procedure as opposed to the possibility of multiple ESWL session.

It is the envisaged that tubeless PCNL will be a routine in the near future. As more cases are done, the selection of patients can then be more refined.

Conclusion

The feasibility of a tubeless PCNL is obvious. The resulting shorter hospital stay, greater post-operative comfort for patient as well as a lower cost should make one consider a modification of its PCNL technique in carefully selected cases. Perhaps in not too distant a future, with a larger series and good patient selection, percutaneous renal surgery can be done as a day surgery procedure.

References

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