

Is There Still a Role for Open Kidney Stone Surgery in the Era of Minimally Invasive Procedures?

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Dear Editor,

The evolution of percutaneous nephrolithotomy (PCNL) techniques, together with significant advancements in laser technology, endoscopic visualization, and aspiration systems for retrograde intrarenal surgery, has markedly diminished the role of open surgery in the surgical management of urinary stone disease (1). Despite its declining use, we report a case in which open kidney stone surgery was performed, underscoring that this approach may still remain relevant in carefully selected patients.

A 36-year-old female patient presented to our clinic with complaints of bilateral flank pain. Abdominal computed tomography (CT) revealed bilateral staghorn calculi. Treatment was initially planned for the right side, and PCNL was performed. Complete stone clearance was achieved after three PCNL sessions. Following the first and second PCNL sessions on the right side, the residual stone burden remained too large to be managed with other minimally invasive treatment options; therefore, a total of three PCNL sessions were performed. Subsequently, both PCNL and open pyelolithotomy were presented to the patient as treatment options. Following a thorough discussion and shared decision-making, open pyelolithotomy was planned for the left side in view of the substantial stone burden, the anticipated need for multiple sessions with a minimally invasive approach, and the prior bleeding episode requiring transfusion following right-sided PCNL, with the aim of achieving complete stone clearance in a single session. Follow-up CT at one month confirmed complete stone clearance (Figure 1).

Patients with staghorn calculi represent a distinct subgroup within stone surgery, and it is well-established that perioperative complications following PCNL are higher in this population compared to patients with non-staghorn stones (2). A meta-analysis comparing PCNL and open surgery for the treatment of staghorn calculi reported no significant differences between the two techniques in terms of stone-free rates, minor complications (Clavien I-II), or major complications (Clavien III-V) (3). Staghorn calculi are frequently associated with infection, and the risk of recurrence remains high if complete stone clearance is not achieved (4). Achieving a stone-free status with PCNL in patients with staghorn calculi may require a longer operative time and multiple access tracts compared to those with non-staghorn stones, which can consequently increase the risk of perioperative complications (5). Our patient required four units of blood transfusion in total after the second and third PCNL procedures, while only one unit was transfused following open surgery due to a postoperative drop in hemoglobin levels.

In assessing the surgical techniques applied to each kidneys in the same patient, open surgery was associated with a longer hospital stay (6 days vs. 3-4 days); however, its capacity to achieve clearance of a greater stone burden in a single session ultimately reduced the need for repeated hospitalizations and minimized the cumulative duration of anesthesia exposure.

This case demonstrates that open surgery remains an alternative option for a highly limited and specific group of patients, following a thorough discussion of treatment options with the patient. In centers with extensive experience in open renal and

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Figure 1. Coronal CT scans illustrating the kidney with staghorn calculi preoperatively (a) and the complete stone clearance postoperatively (b)

CT: Computed tomography

stone surgery, open pyelolithotomy can achieve complete stone clearance in a single session.

In summary, although current surgical treatment options are increasingly shifting toward minimally invasive techniques, open stone surgery may still be considered in very rare and carefully selected patients.

Ethics

Informed Consent: Written informed consent was obtained from the patient for the publication of this case report and any accompanying images.

Footnotes

Authorship Contributions

Concept: S.A., M.F.Ö., H.B.H., Design: S.A., M.F.Ö., H.B.H., Literature Search: F.E.S., Writing: S.A., M.F.Ö., H.B.H., F.E.S., Ç.Ş., Ö.F.B., F.G.G.

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