

Case Report

Percutaneous Retroperitoneoscopic Removal Of Dropped Renal Stones: A Minimally Invasive Alternative To Open Surgery.

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Abstract

Dropped renal stones pose a significant challenge in urological and interventional radiology practice. Traditional treatments include open surgery or percutaneous nephrolithotomy, both associated with potential morbidity. We present a minimally invasive technique utilizing percutaneous retroperitoneoscopy for effective stone retrieval. A 40-year-old female with persistent infection due to dropped renal stones was successfully treated using this approach. The procedure allowed direct visualization and stone retrieval with minimal tissue disruption, resulting in complete symptom resolution. This case underscores the expanding role of interventional radiology in managing complex renal conditions with innovative techniques that enhance patient recovery and outcomes.

Keywords: Retroperitoneoscopy, Dropped renal stones, Percutaneous endoscopy, Minimally invasive technique, Interventional radiology, Retroperitoneal access, Multidisciplinary approach, Renal stone retrieval.

INTRODUCTION

Dropped renal stones can act as foreign bodies, leading to chronic infections, abscess formation, and inflammatory complications. Traditional management often requires open surgery or percutaneous nephrolithotomy, both of which have considerable risks. Minimally invasive approaches, such as percutaneous retroperitoneoscopy, offer potential benefits in reducing morbidity while achieving effective stone removal. Here, we describe a case where percutaneous retroperitoneoscopic retrieval was successfully performed, highlighting its feasibility and advantages over conventional methods.

CASE REPORT

A 40-year-old female presented to the emergency department with severe right flank pain, nausea, vomiting, and urinary difficulties. A non-contrast abdominal CT scan revealed a 2.5 cm proximal ureteral stone, multiple lower-pole renal calculi, hydronephrosis, and a gas-forming infection. Despite urgent

placement of a double-J stent, her condition worsened. Further imaging identified a perirenal fluid collection containing calcified densities consistent with dropped renal stones.

Percutaneous drainage of the perirenal fluid yielded purulent material, with cultures confirming *Klebsiella pneumoniae* infection. The absence of elevated creatinine in the aspirate ruled out urinary leakage. After multidisciplinary discussion, percutaneous endoscopic stone retrieval was chosen as the treatment strategy.

A 10F percutaneous cholangioscope was used for direct visualization, and multiple stones were retrieved with a basket catheter. The procedure was repeated until complete stone extraction was confirmed. Residual fragments were cleared with copious saline irrigation, and a 12F Dawson-Mueller drainage catheter was placed.

At a two-month follow-up, the patient remained asymptomatic, and a CT scan confirmed resolution of the collection and the absence of extrarenal stones.

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Figure 1. Baseline computed tomography (CT) scans (a-b) and follow-up abdominal X-ray and CT scans post-treatment (c-f): (a) Axial contrast-enhanced CT scan illustrating an impacted stone at the ureteropelvic junction (yellow arrow) associated with significant hydronephrosis, and (b) caliceal stones. (c) Initial management involved the placement of a double-J stent. (d-f) Post-treatment axial (d), coronal (e), and sagittal (f) contrast-enhanced CT scans highlighting a perirenal fluid collection (*) and multiple dropped renal stones (white arrows).

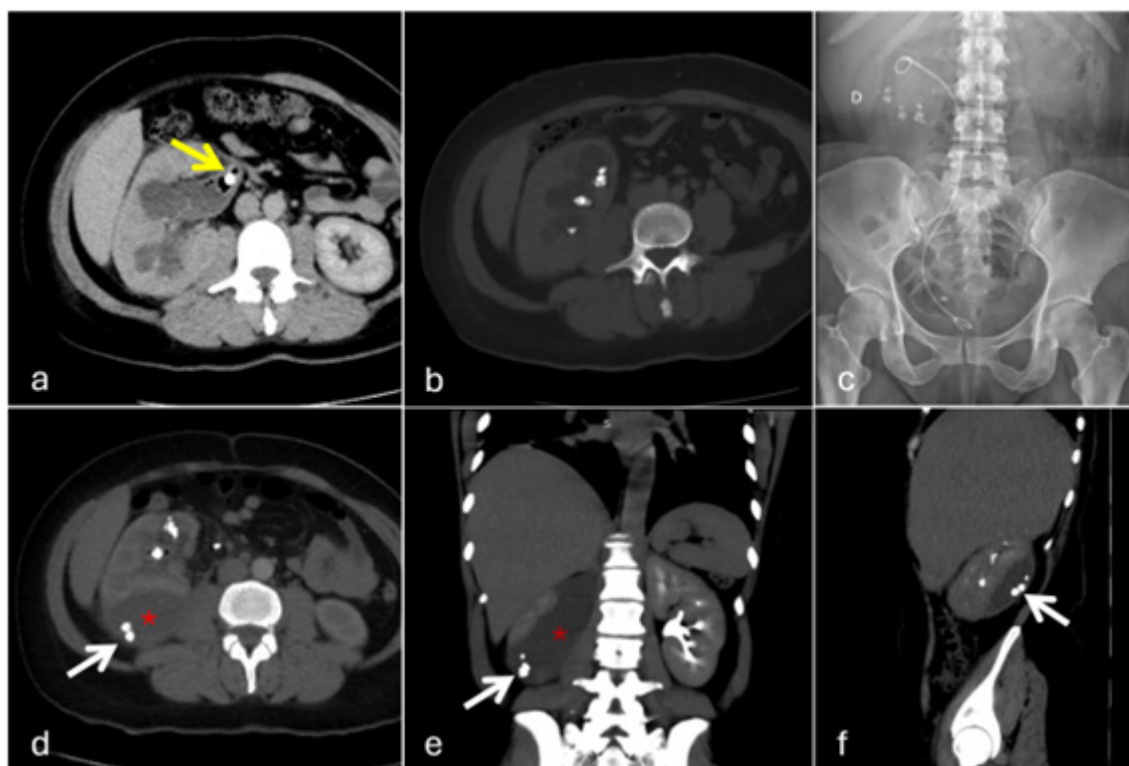


Figure 2. Intraoperative ultrasound findings: (a) Perirenal fluid collection (*) and a dropped stone (white arrow) are identified. (b-c) Hemorrhagic content aspirated from the collection and the retrieved stone, removed using a basket catheter as visualized in (d). Endoscopy image showing the perirenal collection before (e) and after (f) irrigation and drainage.

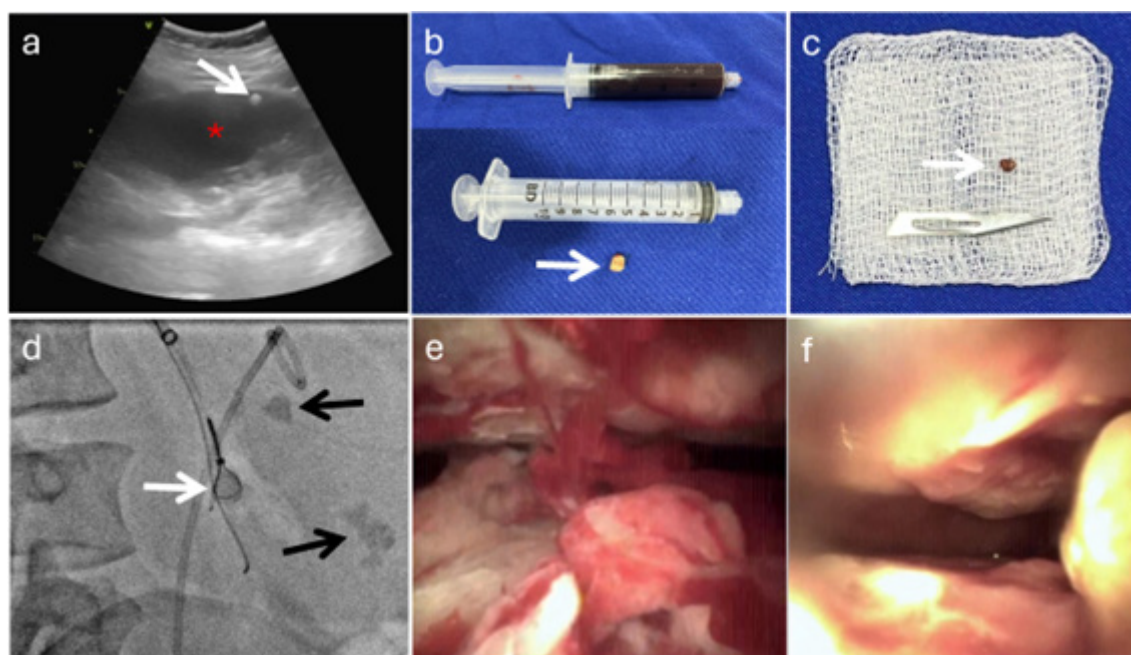
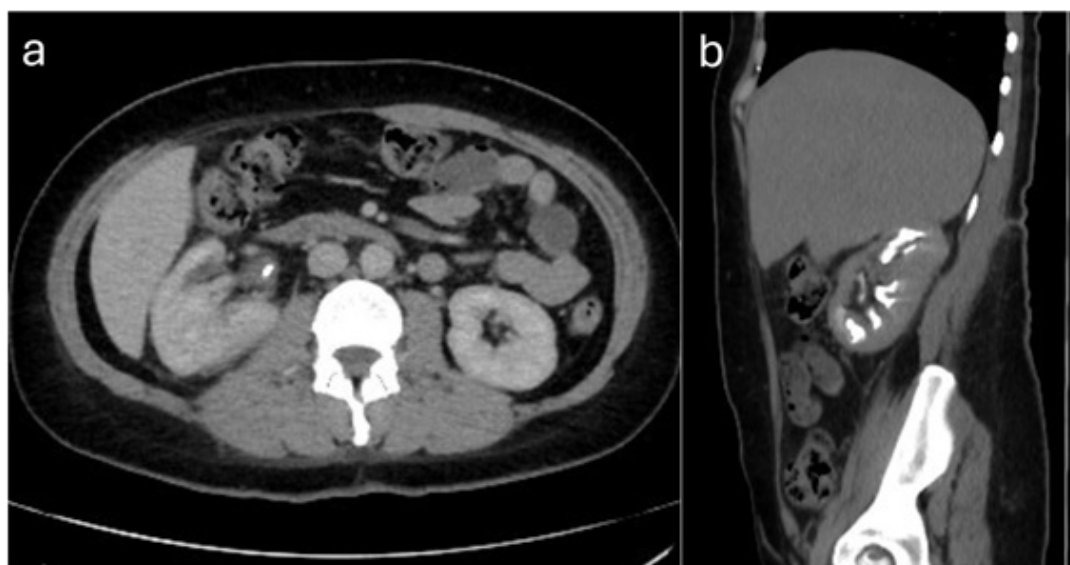


Figure 3. Axial contrast-enhanced CT scan and sagittal view during the excretory phase, acquired 60 days post-treatment, demonstrating complete resolution of the perirenal fluid collection and the absence of renal stones.



DISCUSSION

Dropped renal stones, when left untreated, can lead to persistent infections and complications similar to those seen with dropped gallstones. Historically, surgical intervention was required for their removal. However, advancements in minimally invasive techniques have paved the way for less traumatic alternatives.

Percutaneous retroperitoneoscopy provides a direct pathway for stone retrieval without renal parenchymal manipulation, minimizing the risks of bleeding and renal injury associated with conventional percutaneous nephrolithotomy. Additionally, the use of endoscopic instruments ensures precise stone removal under direct visualization. Previous studies on percutaneous and endoscopic approaches for dropped gallstones have demonstrated reduced morbidity and quicker recovery times. Our study extends this concept to dropped renal stones, illustrating how a hybrid approach combining percutaneous access with endoscopic techniques can optimize clinical outcomes while minimizing complications.

Although literature on percutaneous endoscopic retrieval of dropped renal stones is limited, our case reinforces the feasibility and safety of this approach. Future studies are warranted to validate its broader applicability and to develop standardized protocols for its clinical implementation.

CONCLUSION

Percutaneous retroperitoneoscopic retrieval of dropped renal stones is a safe, effective, and minimally invasive alternative to traditional surgical methods. This technique may replace more invasive procedures in select cases, offering improved patient outcomes and reduced recovery times. Further research is needed to establish standardized guidelines for its use in clinical practice.

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Compliance with Ethical Standards

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Conflict of interest: The authors declare that they have no conflict of interest.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the Ethical Standards of the Institutional and/or National Research Committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Consent for Publication: Consent for publication was obtained for every individual person's data included in the study.

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