

Renal pelvis rupture presenting as an acute abdomen in patient with Alzheimer's dementia: a case report and literature review

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Abstract

Renal pelvis rupture (RPR) with clinical presentation of acute abdomen is an unusual clinical event and in a patient with Alzheimer's dementia is unique in its clinical presentation and differentiating the diagnosis.

We report a case of a 75-year-old male Alzheimer's patient who complained of sudden right-sided flank and abdominal pain followed by nausea, and vomiting, without a history or signs of external trauma. Abdominal ultrasound showed fluid collection close to the right renal pelvis with first-grade hydronephrosis. Computed tomography revealed right colon overdistension and, a 2 mm proximal right ureteral stone, and contrast urography showed a dilated right renal pelvis with extravasation. After the endoscopic treatment with double-J stent, no contrast extravasation was seen on the control CTU, and the stent was removed after four weeks.

Patients with Alzheimer's dementia presenting with acute abdomen and flank pain should be evaluated for renal pelvis rupture with prompt diagnosis and management.

Keywords: renal pelvis rupture; acute abdomen; Alzheimer's dementia; case report

Introduction

Renal pelvis rupture (RPR) is an unusual but crucial clinical event that frequently raises concerns about diagnosis and treatment [1]. The mechanism is acute ureteral obstruction, which causes an abrupt obstruction of urine downstream and a reversal of urine flow that suddenly increases intrarenal collecting system pressure. The renal calyces break, which causes urine extravasation, is considered a renoprotective mechanism because it prevents additional harm to the filtering nephrons [2]. This rupture is considered 'spontaneous' if it is not caused by prior surgery, iatrogenic manipulation, degenerative kidney diseases, or external trauma [3].

Abdominal and flank pain is a common symptom of renal pelvic rupture, nausea, and vomiting, as acute abdominal symptoms are present due to peritoneal irritation [4].

It is questionable whether renal pelvis rupture occurs spontaneously or as a result of unintentional trauma in patients with dementia because these individuals experience a gradual decline in their cognitive abilities and performance, potentially

leading to a higher risk of accidents. Patients with dementia, especially Alzheimer's disease, are 2–8 times more prone to incidental trauma than healthy individuals because they can potentially misjudge environmental hazards, overestimate their ability, or suffer from memory impairment [5]. Eventually, in patients with Alzheimer's dementia, it is difficult to conclude whether the renal pelvic rupture is spontaneous or post-traumatic because most patients are not aware of any trauma, and sometimes the clinical signs of trauma are not present, as described in this case report.

Case report

A 75-year-old male patient with Alzheimer's dementia was brought by his family to the emergency ward due to acute abdominal and right flank pain, followed by nausea and vomiting. The patient and family members were unaware of the exact time of the onset of symptoms or any external trauma. He had no previous complaints of similar pain and had a negative history of urinary stones. Physical examination revealed distension and

Received: October 1, 2024. Revised: January 20, 2025. Accepted: January 31, 2025

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Figure 1. Abdominal CT topogram, coronal view.

tenderness of the abdomen, particularly on the right side, without signs of external trauma. The leukocyte count was slightly elevated ($11 \times 10^9/\text{mm}^3$), C-reactive protein (10.0 mg/dl), and all other serum biochemical findings were within normal ranges, but a urine examination revealed microhaematuria (25–30 Er/HPF). Abdominal ultrasound showed fluid collection close to the right pelvicalyceal system with first-grade hydronephrosis. An abdominal computer topogram showed significant colon distension (Fig. 1), and axial non-contrast CT, a 2 mm proximal right ureteral stone (Fig. 2A). Prolonged contrast CT revealed contrast extravasation from the renal pelvis along the right psoas muscle (Fig. 2B).

Endoscopic management with the placement of a double-J stent was performed, and plain radiography of the urinary tract showed correct stent placement (Fig. 3). All serum biochemical analyses were within the normal range after 48 h. Contrast CT urography performed one week after the intervention showed resolved colon distension and no evidence of contrast extravasation from the right pelvis (Fig. 4A) or along the psoas muscle

(Fig. 4B). The patient was discharged from the hospital in stable condition with normal vital and biochemical parameters. After four weeks, the double-J stent was removed. The patient's follow-up was an ultrasonographic examination of the abdomen and urinary tract at 6 months.

Discussion

This case report of renal pelvic rupture in a patient with clinical presentation of acute abdomen, colon distension, and Alzheimer's dementia is unique in its presentation and differentiating the diagnosis. A thorough medical history is crucial for ruling out pre-existing conditions such as gallbladder disorders, peptic ulcers, pelvic inflammation, and stomach and colon cancer [6]. Overdistension of the right colon in the reported case was explained by irritation of the retroperitoneal part of the colon caused by urine. After excluding abdominal pathology in the present case, by an accurate history, a physical examination, and computed tomography (CT) scanning, the dilemma was between spontaneous and post-traumatic pelvic rupture because the patient was unaware of incidental hazards or trauma. However, owing to the absence of physical signs of trauma and the negative trauma history presented by the patient's family, spontaneous pelvic rupture was presumed.

To review solely cases that present unique manifestations of spontaneous renal pelvis rupture due to ureteral calculi the keywords 'spontaneous renal pelvis rupture' and 'urinary stone', and 'case report' excluding 'absence of urinary tract obstruction' and 'pyelocaliceal diverticula' and 'percutaneous nephrolithotomy' and 'ureteropelvic junction' were searched in PubMed and Google Scholar for case reports published in English in last 25 years. Finally, of the articles found, four reported cases had spontaneous renal pelvis rupture due to calculi, as shown in Table 1. We did not find instances of renal pelvic rupture in patients with Alzheimer's dementia.

The results are presented in Table 1 [4, 7–9]. Male patients seemed more vulnerable than female patients since all reported cases were male. As seen in Table 1, hematuria is not a typical symptom of non-traumatic renal pelvis rupture but may occur due to erosion of the ureter during calculi downflow.

This condition seems to be underreported in the literature because contrast-enhanced imaging studies are not

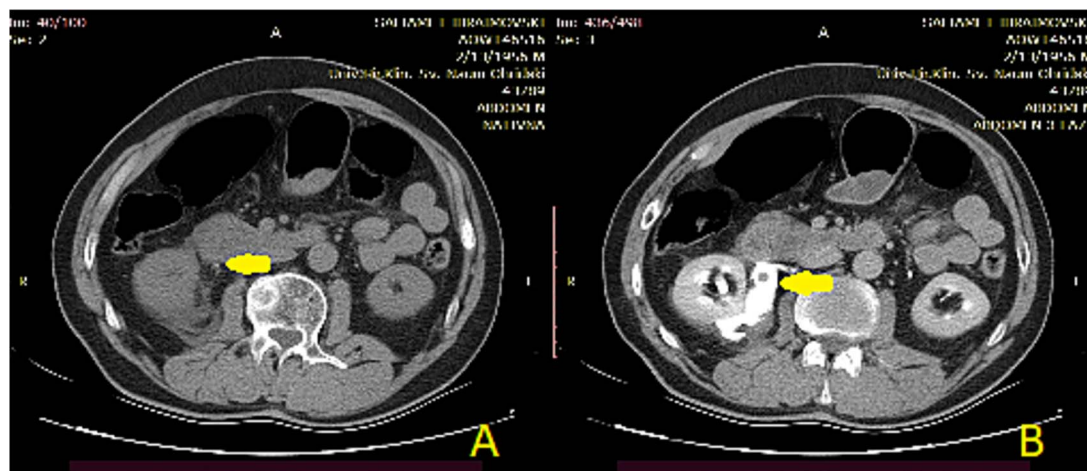


Figure 2. A. Abdominal axial CT, non-contrast series shows fluid content around the right kidney and 2 mm mineral structure in the right ureter (arrow) B. Prolonged phase of the contrast-enhanced CTU tract shows contrast extravasation around the right kidney with a filling defect at the level of proximal right ureter (arrow).

Table 1. The literature review of case reports of spontaneous renal pelvis rupture due to ureteral calculi by authors, clinical presentation and treatment.

Author	Year	Patient's age	Etiology	Clinical presentation	Treatment	Duration of stenting
Yanaral et al. [1]	2017	86	8 mm left kidney stone	left flank pain, nausea, vomiting, and tenderness on the left side of the abdomen and left flank region	Double-J ureteral stent	/
Diaz et al. [2]	2011	46	7 mm left ureterovesical junction stone	left flank pain	Double-J ureteral stent	2 weeks
Koktener et al. [3]	2007	63	calculus in the ureter	acute abdomen symptoms, nausea, vomiting, abdominal tenderness	/	/
Gulati et al. [4]	2013	50	6x4mm	pain in left loin, fever, dyspnea, melena, thrombocytopenia	Percutaneous nephrostomy	2 weeks



Figure 3. Plain X-ray of the urinary tract, after JJ stent placement.

recommended as the first-line imaging method for the evaluation of patients with acute abdominal and flank pain [4]. As it can be easily missed, especially in the elderly with dementia, as in the reported case, a thorough diagnostic evaluation is recommended.

Ultrasound evaluations of renal pelvis rupture have a high sensitivity for detecting a small amount of fluid extravasation, but a low specificity for distinguishing urinoma from hematoma or abscess [4]. Urine extravasations on ultrasound findings can be defined as small amounts of perirenal extravasation around the lower renal pole and fluid collection close to the pelvicalyceal system, which is not always dilated (grade 1), or a large collection of fluid in the perinephric area that expands along the ureter in the retroperitoneum (grade 2) [4], as observed in the present case.

Delayed CT scanning after intravenous contrast is the most effective diagnostic method for this condition because it can precisely identify the rupture site and confirm the presence of urine extravasation [4]. If left untreated, this condition can lead to sepsis, acute kidney injury, infection, and abscess formation [10].

Conservative management is preferable in straightforward cases and in cases with small urinomas [4] and endoscopic minimally invasive surgical intervention is limited to more complex cases that involve large urinomas with good prognosis after treatment [7, 8].

Conclusion

Patients with Alzheimer's dementia presenting with acute abdominal and flank pain should be evaluated for renal pelvic rupture with prompt diagnosis and management.

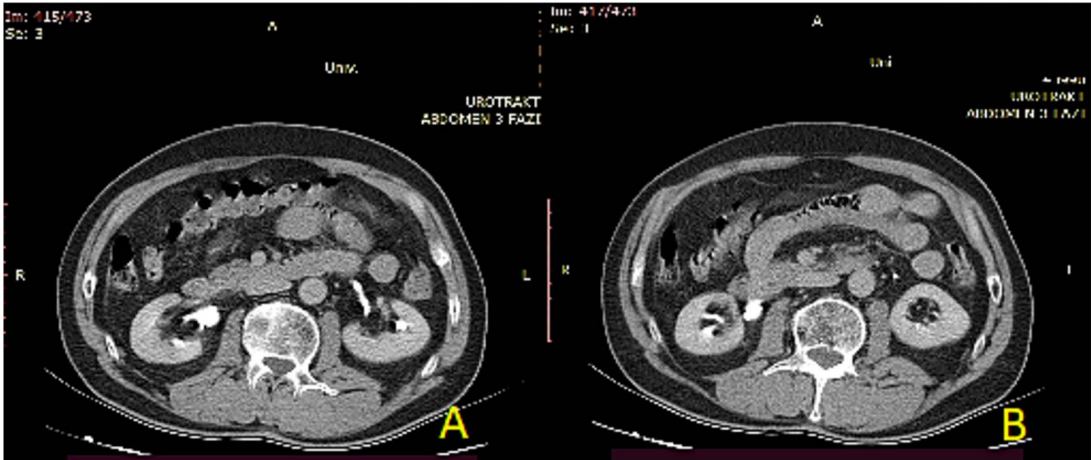


Figure 4. Contrast CTU, axial view, after JJ stent placement without extravasation of contrast from (A) renal pelvis or along psoas muscle (B).

Acknowledgements

None to mention.

Conflict of interest

No conflict of interest.

Funding

None.

Ethical approval

The publication of this case report was approved by the Ethical Board of the institution where the patient was referred.

Supplementary data

Supplementary data is available at the Oxford Medical Case Reports online.

Consent

A written consent of participation and publishing was obtained from the patient.

Guarantor

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