ENDOUROLOGY
Case Report

# Spontaneous rupture of renal pelvis as a rare complication of ureteral lithiasis

## *Üreterolityazisin seyrek görülen bir komplikasyon olarak spontan renal pelvis rüptürü*

Orestis Porfyris[1], Elena Apostolidi[2], Andromachi Mpampali[2], Paraskevas Kalomoiris[1]

**ABSTRACT**

Spontaneous rupture of renal pelvis with urine extravasation is a rare condition and usually associated with obstructing ureteric calculus. It poses diagnostic and therapeutic dilemmas, while a stepwise approach for the confirmation of diagnosis, treatment and follow up is needed. We present a case of a 75-year old male patient who had a renal pelvis rupture with perirenal extravasation of urine due to a 4 mm stone located at the right ureterovesical junction. Diagnosis was confirmed by computed tomography, while the patient was treated successfully with the placement of a percutaneous nephrostomy. A week later a CT- nephrostomography showed the healing of renal pelvis with no extravasation and no evidence of the obstructing stone.

**Keywords:** Pelvis rupture; percutaneous nephrostomy; ureteral calculus; urinoma.

**ÖZ**

İdrar ekstravazasyonuyla birlikte renal pelvisin spontan rüptürü seyrek görülen bir durum olup genellikle obstrüktif üreter taşı tabloya eşlik etmektedir. Tanı ve tedaviye ilişkin ikilemler sunmakla birlikte tanı ve tedavinin doğrulanması ve izlem için basamaklı bir yaklaşım gereklidir. Sağ uretervesikal bileşeğe yerleşik 4 milimetrelik taş nedeniyle pelvis rüptürüyle birlikte perirenal idrar ekstravazasyonu oluşan 75 yaşındaki bir erkek hastayı sunuyoruz. Bilgisayarlı tomografi ile tanı doğrulanmış ve hasta perkütan nefrestomi tüpü yerleştirilerek başarıyla tedavi edilmiştir. Bir hafta sonra çekilen BT-nefrostomografisi herhangi bir ekstravazasyon ve tıkayıcı taş kanıtı olmaksızın böbrek pelvisinin iyileştiğini göstermiştir.

**Anahtar kelimeler:** Pelvis rüptürü; perkütan nefrostomi; üreter taşı; ürinoma

## Introduction

Ureteral stones usually present with renal colic due to the distention of the collecting system from obstructing calculus. Most of the stones will pass spontaneously, depending on their size and location, without any further intervention; however a prolonged presence of a calculus could lead to complications such as acute infection, hydronephrosis and renal insufficiency. Spontaneous rupture of the collecting system is a rare complication of ureteral stone obstruction. It is the commonest cause of urine extravasation, while other causes include obstruction from malignancies, trauma, iatrogenic manipulation, pregnancy, pelvoureteral junction (PUJ) obstruction.[1-5] We present a case of this unexpected condition, while diagnosis, therapeutic approach and follow-up are discussed.

## Case presentation

A 75-year old male patient was admitted in our emergency department due to persistent right flank pain, right abdominal pain and 3 episodes of vomiting. His temperature, blood pressure and pulse rate were normal. Physical examination revealed abdominal tenderness at the right side, suggestive of localized peritonitis. Serum creatinine, urea, haemoglobin and white blood cells count were within normal limits, while urine examination showed haematuria without pyuria. As far as radiological findings is concerned, ultrasonography revealed a right side medium hydroureteronephrosis with a stone located

[1]Clinic of Urology, General Hospital of Laconia, Sparta, Greece

[2]Clinic of Radiology, General Hospital of Laconia, Sparta, Greece

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**Correspondence:** Orestis Porfyris
E-mail: orestisporfyris@yahoo.gr



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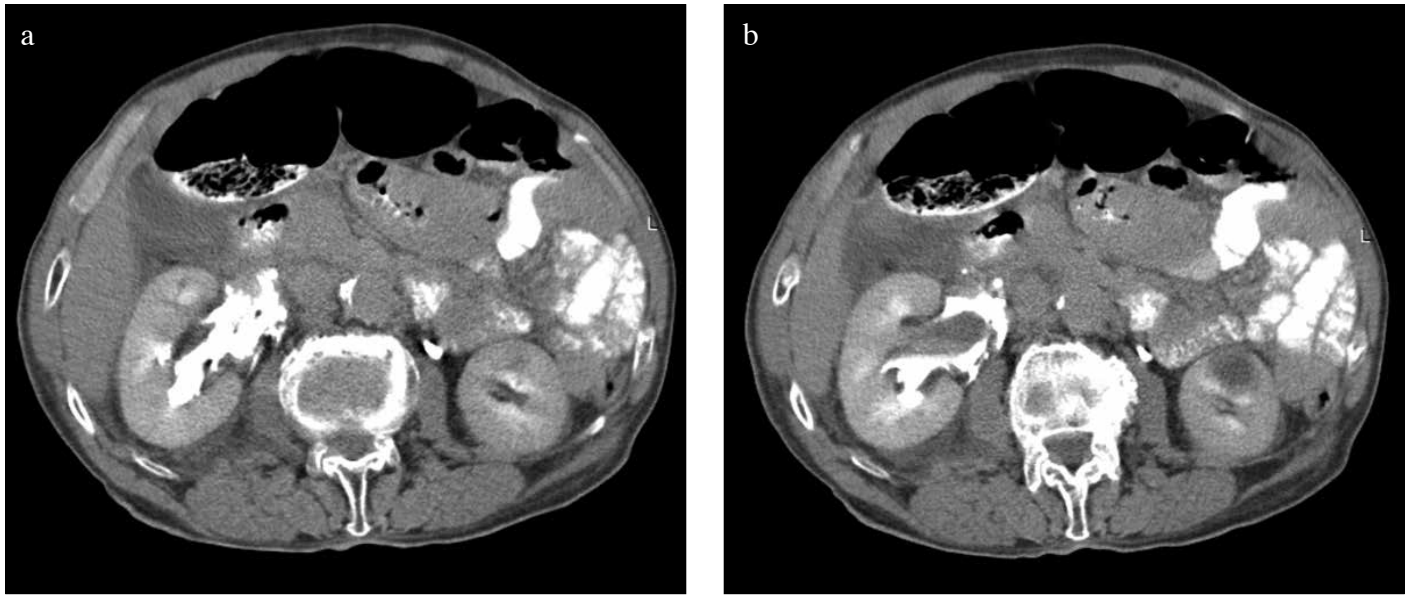


Figure 1. a, b. Delayed films of CT scan depicting contrast medium extravasation

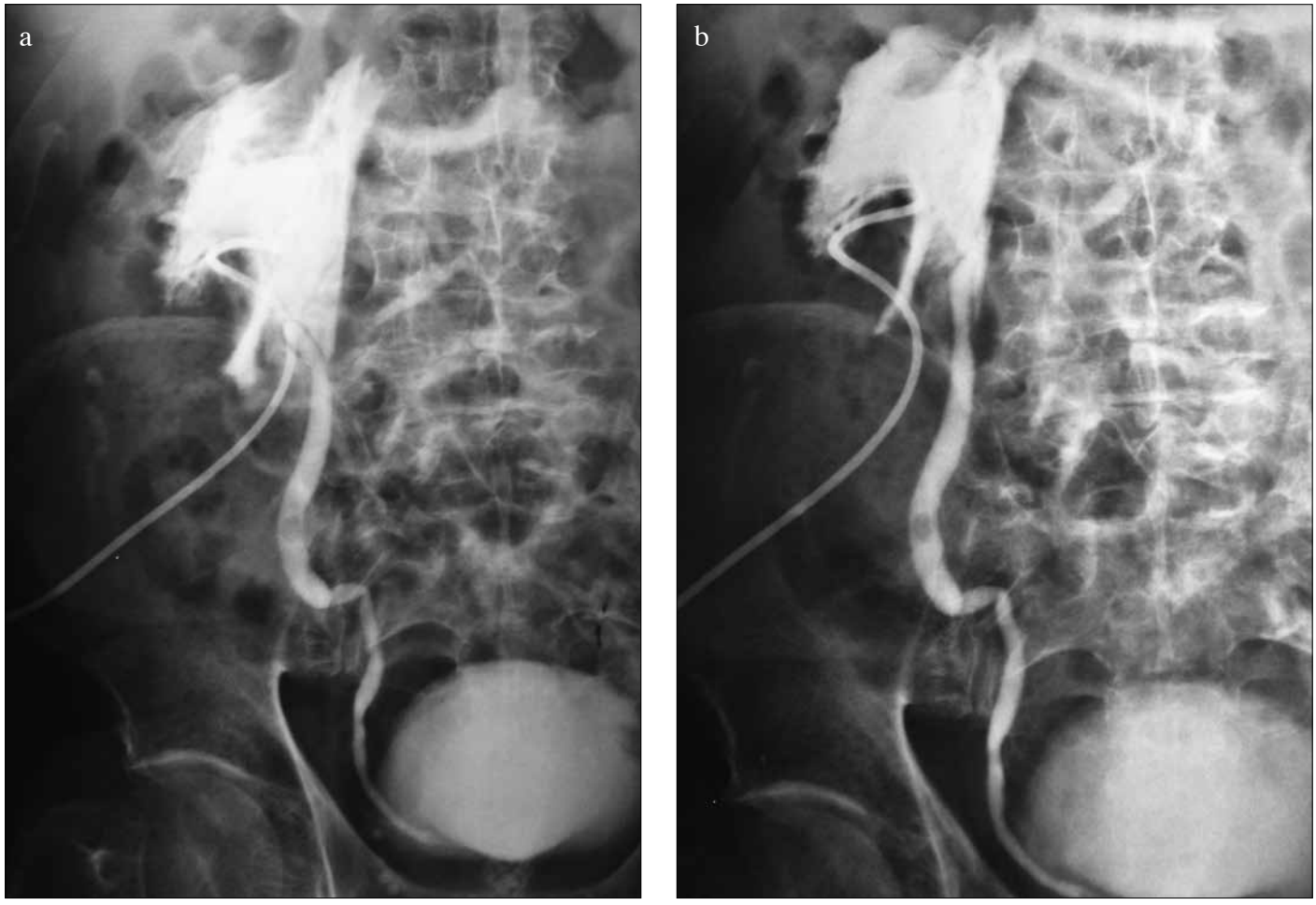


Figure 2. a, b. Nephrostomogram performed 3 days later

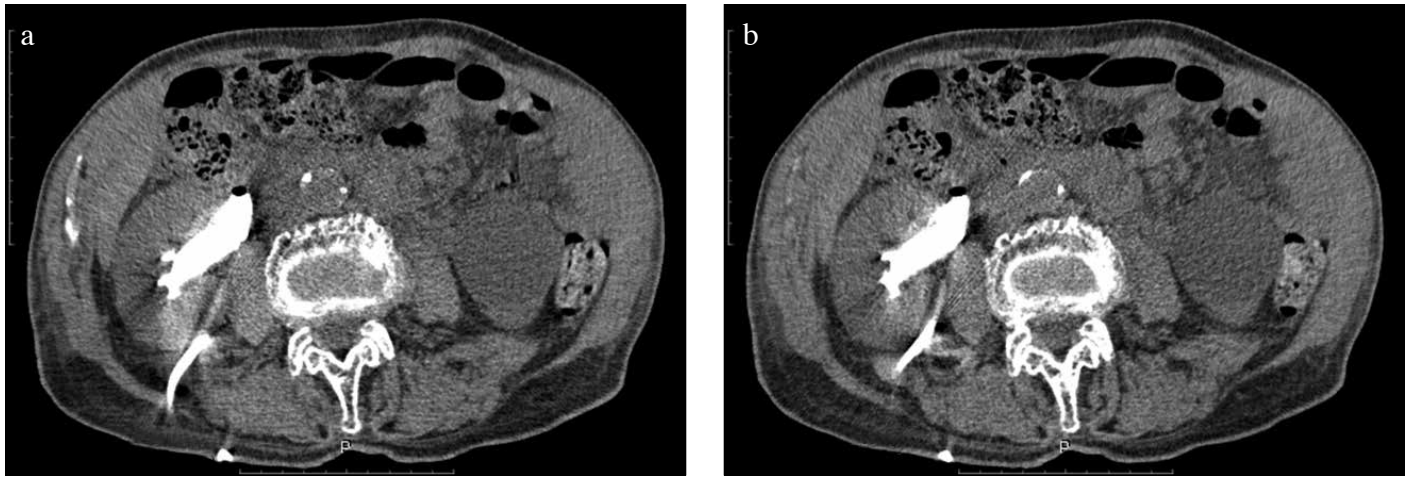


Figure 3. a, b. CT nephrostomography depicting a normal renal pelvis

at the right ureterovesical junction. Further investigation was done with computed tomography (CT scan) showed a 5 mm calculus at the right ureterovesical junction with ipsilateral hydroureteronephrosis. CT urography showed extravasation of the contrast medium in delayed films at the parapelvic, paranephric area and along the ipsilateral ureter, suggestive of rupture of the collecting system, and also fluid collection at the retroperitoneum, suggestive of urinoma (Figure 1).

An ultrasound guided nephrostomy tube was inserted and intravenous antibiotics were given. After 3 days a nephrostomogram was performed and the leakage was still present (Figure 2). After 7 days and while the patient constantly improved, a CT nephrostomography was performed, no contrast medium extravasation was found and no stone in vesicoureteral junction (VUJ) (Figure 3). The nephrostomy tube was closed and the next day was removed. The patient was discharged in excellent condition.

## Discussion

Renal pelvis rupture is a rare manifestation of ureteral stone obstruction; Wunderlich in 1856 was the first to describe spontaneous pelvic rupture. A more common condition is forniceal rupture which is related to obstruction as well and is caused by the same aetiologies that can cause pelvic rupture.[6] A proposed mechanism is the sudden increase in the intrapelvic pressure that exceeds the tensile strength of the pelvic tissue and results to disruption and extravasation of urine. This phenomenon is likely to be renoprotective by decreasing the pressure in the collecting system and thus preventing its damage.[7] Although it is difficult to assess it, this hypothesis seems rational.

Pelvic rupture has the same symptoms as renal colic, e.g flank pain, nausea, vomiting. Physical examination reveals abdominal tenderness and signs of peritoneal irritation; thus differential diagnosis includes inflammatory diseases of the abdomen e.g appendicitis, cholecystitis. From the imaging tools that are used, plain film of the abdomen may show the stone or signs of paralytic ileus. Ultrasonography usually shows hydronephrosis and perinephric fluid collection. Intravenous urography (IVU) and CT urography (with images obtained 5-20 min after contrast medium injection) are the most accurate imaging modalities and show contrast medium extravasation in the peripelvic, perinephric or retroperitoneal space.

Treatment is dependent to the underlying cause of obstruction. Placement of a double j stent or a percutaneous nephrostomy is the method of choice for the urinary diversion in small ruptures. Percutaneous drainage of the urinoma is seldom necessary. Open surgery can be an option in difficult cases associated with extensive rupture of renal pelvis.[2]

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