

Hydronephrosis and pelvic rupture due to calculus with completely normal laboratory results

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Abstract

Both side pain and urinary system pathologies are common reasons for admission to emergency rooms. Spontaneous renal pelvic rupture is also extremely rare. Existing renal anomalies and calculi increase the risk of rupture. We present a 50-year-old male who experienced unilateral renal pelvis rupture spontaneously and without trauma.

Introduction

Ureteral stones are often present along with renal colic, a condition caused by the enlargement of the collecting system. The voluntary passage of stones without the need for further intervention is generally observed, although this is dependent on the dimensions and placement of the stones. An elevated probability of encountering adverse effects including acute infection, hydronephrosis, and renal failure corresponds to the protracted presence of the stone in the ureter. As a rare consequence of urolithiasis, renal pelvic or collecting system rupture is not uncommon. It typically manifests as a consequence of an underlying urinary disease. Less frequently, it may occur without any apparent cause. The primary contributing factor for the rupture of the collecting tract is elevated pressure in the urinary system caused by conditions such as hydronephrosis, infection, and blockage. Stones are the primary cause in older patients. The clinical manifestations seen by patients are typically vague and are associated with the underlying urinary disease. The presence of symptoms such as renal colic, dull flank pain, fever, nausea, vomiting, and cystitis may warrant hospital admission. In contrast to cases of renal parenchymal rupture that necessitate immediate care, the clinical progression of this condition is typically characterized by a mild severity.¹⁻⁶

The primary aim of this research endeavor is to conduct an exhaustive examination of the pathological indications of hydronephrosis and pelvic rupture in an individual who presents with a normal laboratory evaluation. The patient in question was admitted to the emergency department after a clinical diagnosis of calculus formation-induced renal colic was established.

Case Report

A male patient, aged 50, was admitted to the emergency department due to abdominal pain. The patient reported two days for the persistence of his pain and sought medical attention at the emergency room upon experiencing an escalation in its severity. The onset of the patient's pain occurred in the left upper quadrant and subsequently extended to the lower quadrant. The patient exhibited discomfort in the left costovertebral angle. The preva-

lence of pain on the left side was prominent. In the physical examination of the patient, a voluntary defense was dominant. However, there was a suspicious rebound sign in the left lower quadrant that varied on repeat examination. In addition, left costovertebral angle sensitivity was positive. No abnormal findings were detected during inspection and auscultation. Following the initial diagnosis of renal colic, the patient underwent laboratory tests while receiving hydration and analgesics. Following the completion of laboratory data analysis, it was observed that all hemogram parameters, glucose, urea, creatinine, liver function tests, amylase, lipase, and other biochemistry parameters of the patient were determined to fall within the reference range. Notably, this outcome is of interest. Furthermore, the comprehensive urinalysis did not reveal the presence of either leukocytes or erythrocytes. Based on the patient's clinical presentation and physical examination findings, a diagnosis of renal colic was indicated. In light of the patient's unremarkable laboratory values, further diagnostic imaging was deemed necessary. The individual had an abdominal computed tomography. Although non-contrast tomography is more valid and sufficient for the suspicion of calculus in the urinary system, tomography was planned both without contrast and with contrast to be able to exclude the severity of pain suspicious examination findings, and other causes of acute abdominal pain in the patient at once. A calculus measuring 6x4 mm was detected at the ureterovesical junction, which is the point where the ureter connects to the bladder, specifically in the distal portion of the left ureter (Figure 1). The tomographic imaging approach revealed noticeable enlargements in the left renal pelvicalyceal structures, accompanied by a clear fluid appearance indicative of urine leakage in the medial and posterior adjacent areas of the left kidney (Figure 2). The findings were considered to be in line with a rupture caused by hydronephrosis. The individual in question made an appointment with a urologist for medical attention, and further evaluation was carried out. After the patient's calculus spontaneously descended into the bladder, the urologist provided conservative treatment by administering analgesics and antibiotic therapy. The decision was made to pursue further medical attention based on the patient's evident and regular urine production. After three weeks, the patient's imaging findings showed improvement, and as a result, the patient, who had no persisting symptoms, was scheduled for a normal follow-up examination.

Discussion

The occurrence of spontaneous renal pelvic rupture, initially documented by Wunderlich in 1856, is an infrequent complication associated with obstructive ureteral stones.⁷ The suggested process involves the extravasation of urine through a defect resulting from a sudden rise in intrapelvic pressure, surpassing the tension resistance of the pelvic tissue. Therefore, the reduction of intrapelvic pressure serves to minimize potential renal injury.⁸

The clinical presentation of renal pelvis or collecting system rupture is defined by a relatively benign development, without simultaneous rupture of the surrounding kidney tissue. This ailment, known as urinary extravasation, refers to the escape of urine into the retroperitoneal region and is commonly caused by underlying urinary disorders. Renal pelvic rupture is associated with a range of problems, such as hydronephrosis, trauma, urinary system obstruction caused by stone disease, posterior urethral valve, anomalies in the ureteropelvic region, vesicoureteral reflux, malignancies, and retroperitoneal diseases.^{2,3,9,10}

The clinical presentation of pelvic rupture shares similar manifestations with renal colic, including symptoms such as flank pain, nausea, and vomiting. The identification of abdominal discomfort and peritoneal irritation during a physical examination necessitates consideration of inflammatory conditions such as appendicitis and cholecystitis. Opaque stones or paralytic ileus can be observed using direct radiography in imaging techniques. Hydronephrosis and perinephric fluid accumulation are frequently observed in ultrasonography. Intravenous urography and CT urography are imaging modalities that effectively visualize contrast extravasation in the pelvic, perinephric, or retroperitoneal regions. These techniques offer superior diagnostic accuracy, particularly when late

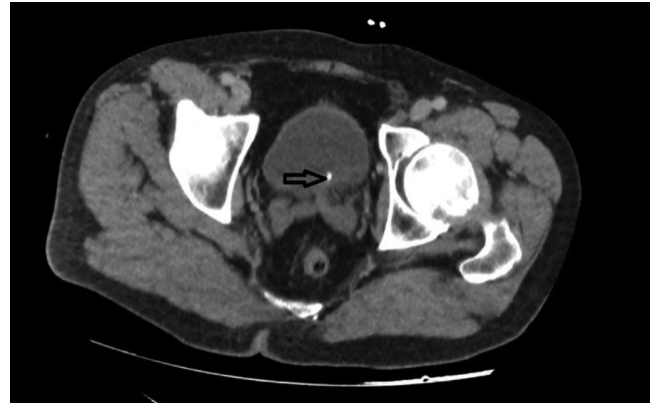


Figure 1. Computed tomography image of the calculus seen in the ureterovesical junction area.

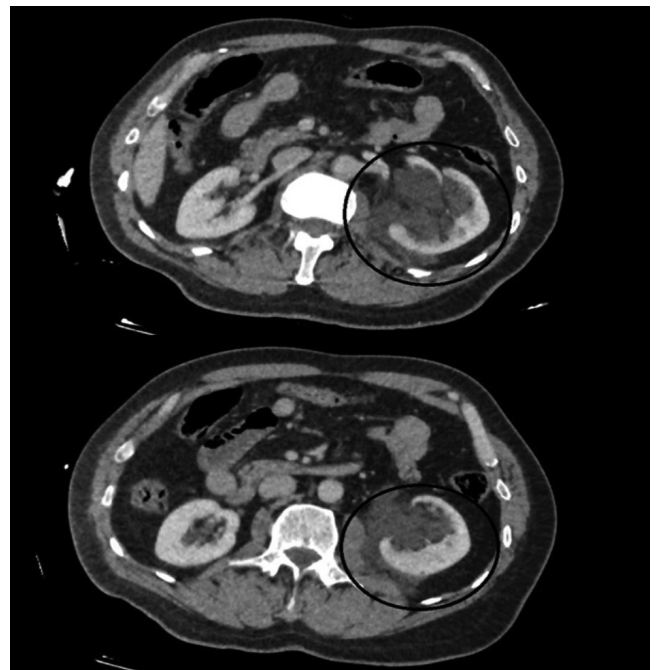


Figure 2. On computed tomography, evident dilations in the left renal pelvicalyceal structures, together with a distinct fluid look that is consistent with urine leakage in the medial and posterior adjacent regions of the left kidney.

images are obtained, particularly in instances where a urinoma is suspected.¹¹ CT abdomen and pelvis without and with IV contrast is frequently used in the genitourinary system to assess whether a renal lesion, such as a cyst or tumor, exhibits enhancement. No research provides evidence of any extra advantage of non excretory phase postcontrast CT, in addition to noncontrast CT, when assessing urolithiasis.¹² Although we were aware of this in our case, we aimed to rule out conditions that bothered us in the differential diagnosis by using both methods.

The management of urinary tract rupture often follows a conservative approach. Urinary diversion techniques, such as the use of a double-J catheter or percutaneous nephrostomy, should be employed when there is a confirmed rupture. Nevertheless, when there is physiological urine extravasation, diversion is typically unnecessary.

Though the literature contains situations similar to ours, these cases typically developed either spontaneously or as a result of catheter application or invasive treatments.¹³⁻¹⁵ In this case, we aimed to enhance the existing literature by providing a detailed account of the uncommon condition of pelvic rupture caused by renal calculus. We present our diagnosis during the emergency department evaluation and the subsequent course of action.

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