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Case Report

Idiopathic Renal Pelvis Rupture; Case Report

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Abstract

The paper describes three cases of isolated renal pelvis rupture, which were treated in the Department of Urology and Urological Oncology at SPZOZ Kędzierzyn-Koźle between 14-10-2022 to 17-11-2022. These cases show the correlation of IRPR /idiopathic renal pelvis rupture with urinary tract stones. The patients on whom we will present this condition include a 42-year-old woman with stones in the distal segment of the left ureter, a 69-year-old woman with stones in the abdominal segment of the ureter, and a 61-year-old man with a stone near the opening of the left ureter.

Introduction

Isolated rupture of the renal pelvis is a very rare situation in which a rupture occurs involving only the renal pelvis without affecting the calyceal domes. The most common condition associated with IPMN is urinary tract stones, especially those occurring alongside pelviureteric junction obstruction.

Case Presentation

Case 1.

A 42-year-old female patient admitted urgently from the General Surgery Department due to left-sided renal colic on the background of confirmed left distal ureteral calculi on abdominal CT with suspected urinary tract perforation. Abnormalities in blood biochemical tests: CRP protein 8.85 mg/dl/N: < 0.50 H / Leukocyturia and erythrocyturia / erythrocytes 80 Ery/µl; leukocytes 11 cells/µl <10 cells/µl; fresh erythrocytes 78 cells/µl <7 cells/µl; few bacteria, cocci +.

CT scan of the abdomen and pelvis was performed using spiral technique with 2.5mm slices before and after intravenous contrast administration with secondary reconstructions in the frontal and sagittal planes. Post-contrast scans were performed in multiple phases. Referral data: Left-sided renal colic, left ureteral stones, fluid layer around the left kidney on ultrasound. The examination shows stones in the distal portion of the left ureter. The stone is located in the intramural section within the bladder. The size of the stone is 5.3mm. The average density of the stone is 730 HU. The left ureter is dilated to 15mm in the segment at the psoas muscle. No stones were detected in the remaining part of the left ureter. No stones were found within the left kidney. The excretion of contrast by the left kidney is impaired - delayed. Within the space limited by Gerota's fascia around the left kidney and along the left ureter, fluid is visible - the overall picture indicates perinephric inflammation. Fluid is also visible in the pelvis, where it surrounds the body of the uterus, which is physiologically anteverted. Fluid is also seen in the peritoneal cavity under the left dome of the diaphragm. Fluid is also visible between the dorsal layers of Gerota's fascia and the fascia layer on the posterior wall of the abdominal cavity. Traces of fluid are present in the left pleural cavity. The adrenal glands are unchanged. An emergency JJ catheter 4.8F was intubated into the left ureter, and antibiotic therapy was ordered.

Case 2.

A 69-year-old woman who was admitted urgently due to right ureteral stones with secondary grade II hydronephrosis. UO-CT examination: 8 mm stone in the abdominal part of the right ureter with secondary perforation near the renal pelvis and urine leakage around the kidney. Around the right renal collecting system and the initial part of the ureter, there are urine leaks visible on contrast and free fluid, not exceeding the thickened Gerota's fascia. A level

of contrast-enhanced urine is also visible in the renal collecting system. The collecting system and the initial part of the ureter have thickened, enhancing walls. The left kidney, its collecting system and ureter are normal. The gallbladder is of normal size, with a small thickening up to 4 mm in the area of the fundus, with no stones visible on CT. The spleen is homogeneous, not enlarged, with small calcification. The pancreas is atrophic, with numerous amorphous calcifications within it. Both adrenal glands are homogeneous, not enlarged. Numerous diverticula in the colon, particularly in the sigmoid. No enlarged lymph nodes were observed internaly or retroperitoneally. Numerous amorphous calcifications in the mesentery. Thoracic aorta widened to 37 mm at the limit of the examination. In the anterior-left lateral part above the diaphragm, an 18 mm thick hypodense structure is visible, not present in the examination of 23-09-2014 - parietal thrombus? Abdominal aorta with normal course, without segmental dilations, atherosclerotic. 8 mm nodule in segment 8 of the right lung - also present in the examination of 23-09-2014, single fibrous morphological changes. Degenerative-productive changes of the spine. Deviations in biochemical tests: CRP protein 8.40 mg/dl < 0.50; Creatinine 1.13 mg/dl/N: 0.55-1.02.

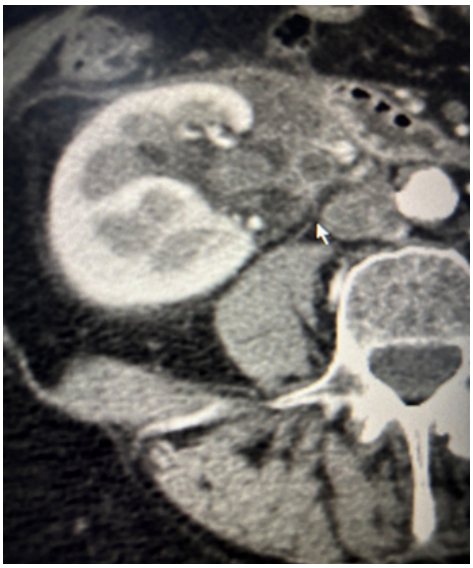

Figure 1: CT scan - Around the right renal collecting system and the initial segment of the ureter, contrast-stained urine leakage and free fluid are visible, not exceeding the thickened Gerota's fascia. A level of contrast-stained urine is also visible in the left collecting system. Right renal pelvis stone.

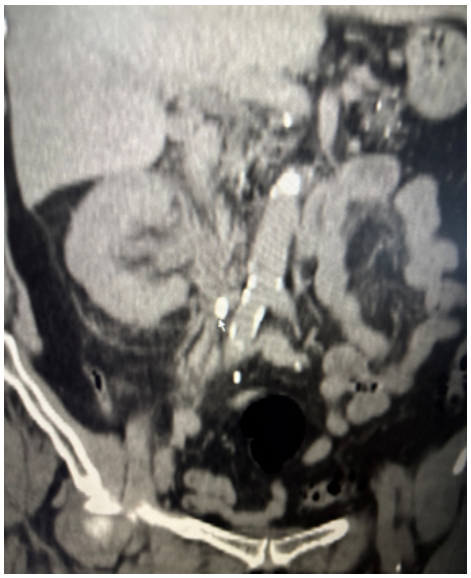

Figure 2: CT scan- right ureter calculus.

An urgent ureterorenoscopy /URS/ procedure and JJ stent insertion in the right kidney were performed on the patient

Case 3.

A 61-year-old man was admitted urgently due to left-sided renal colic. Abnormalities in biochemical tests: Leukocyturia, leukocytes 11 cells/µl (N: <10 cells/µl); erythrocyturia, fresh erythrocytes 18 cells/µl (<7 cells/µl); creatinine (Serum) 2.06 mg/dl (N: 0.72 - 1.18). CT of the abdominal cavity and pelvis shows a calcified stone at the opening of the left ureter measuring 4x3.5 mm with a density of about 700 HU. Proximal to the stone, dilatation of the left ureter to about 4 mm, the renal pelvis to about 14 mm, and the renal calyces to about 3 mm is visible. No other stones are detected in the urinary system. Active contrast-enhanced urine extravasation into the left perirenal space - radiological features of perforation of the left upper urinary tract. The walls of the left upper urinary tract show increased contrast uptake consistent with reactive changes. In the left perirenal space, strands of oedema and gravitationally dependent fluid, most likely urine, are visible. Kidneys are typically positioned and within normal size limits. Numerous peripelvic cysts of the left kidney up to 25 mm in diameter. Peripelvic cyst of the right kidney up to 18 mm in diameter. In the right kidney, there is a tangential cyst measuring 13x15 mm, with a density of about 40 HU, with smooth well-defined contours, showing slight enhancement to about 44 HU after intravenous contrast administration - a Bosniak 2 lesion. A small amount of low-density fluid in the vesicorectal recess, within

which a gravity-dependent calculus measuring 7x6 mm is visible. Enlarged prostate measuring 49x37x58 mm, with the presence of calcifications. Degenerative spine disease. Multi-level discopathy of the L-S spine. No other changes are observed in the examined area.

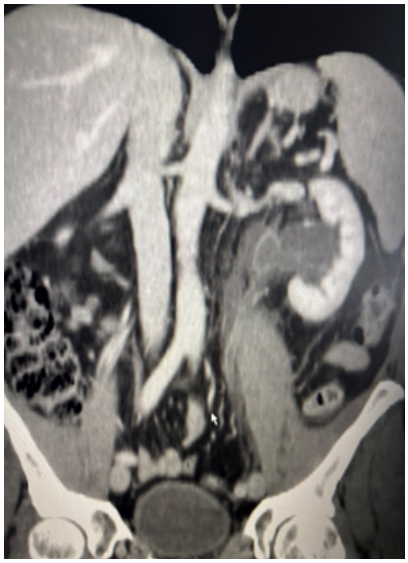

Figure 3: CT scan - active contrast staining of urine in the left perirenal space - radiological features of perforation of the left urinary collecting system. The walls of the left urinary collecting system show features of increased contrast uptake as seen in reactive changes.

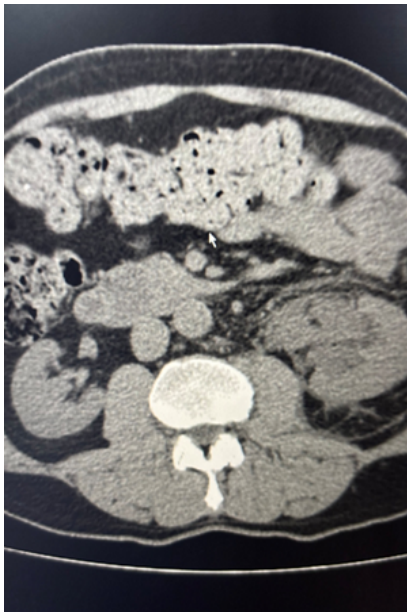

Figure 4: CT scan - in the left perinephric space, visible strands of oedema and fluid accumulating due to gravity, most likely urine.

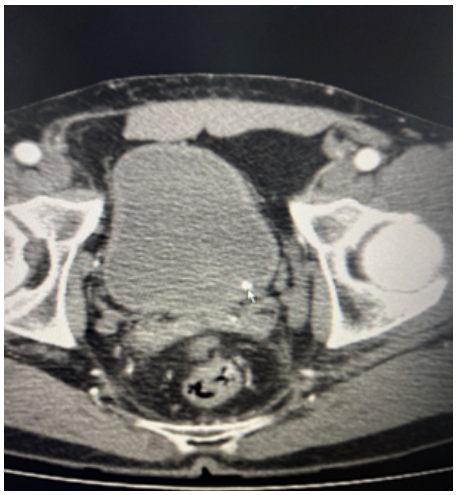

Figure 5: CT scan, deposit at the left ureteral orifice.

Discussion

In the available literature, authors have encountered several causes of spontaneous renal pelvis rupture. In the work of Halachev et al., the presence of a urothelial tumour of the pelvis with subsequent weakening of the structures of the pelviureteric junction walls caused a spontaneous rupture necessitating emergency nephroureterectomy [1]. Spontaneous bilateral rupture of the pelves occurred during a CT scan in the course of diagnostic haematuria [2], and the patient was immediately transferred to the urology department and underwent bilateral intubation with JJ ureteral stents. Ureteral stricture [3] appears to be the most common cause of increased intrarenal pressure, which may be caused by stones [4-6] or congenital narrowing of the pelviureteric junction [7]. Extracorporeal shock wave lithotripsy /ESWL/ generating kinetic energy targeted at a stone in the renal pelvis caused rupture of the pelvis wall in the work of Ameno et al. [8]. During pregnancy, natural urinary stasis is observed in the right kidney, a common reason for urological consultations, in a patient in the 20th week of pregnancy spontaneous rupture occurred [9] treated with JJ catheter intubation, and a healthy baby boy was born at term.

Conclusion

The reason for patients' hospitalization was colicky pain, which is the most common symptom reported by patients during emergency visits; however, what the authors found surprising were the observed spontaneous ruptures of the renal pelvis walls. The appropriate management proved to be immediate urinary tract decompression, which prevented complications such as massive haematuria, kidney abscess, or urosepsis

Ethical Statement

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

Conflict of Interest

The authors declare no conflict of interest.

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