CASE REPORTS

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Spontaneus rupture of renal cell carcinoma in anuric patient on automated peritoneal dialysis

Spontana ruptura karcinoma bubrega kod anuričkog bolesnika na automatskoj peritoneumskoj dijalizi

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Abstract

Introduction. Spontaneous subcapsular or perirenal hematomas are relatively uncommon but often diagnostically challenging conditions. We present the first case described in the literature of successful continuation of the full regimen of peritoneal dialysis, that started immediately after urgent nephrectomy due to the spontaneous rupture of kidney cancer. **Case report.** A 55-year- old man had received continuous ambulatory peritoneal dialysis during 5 years for end-stage renal disease secondary to hypertensive nephropathy. He was switched to automated peritoneal dialysis two months before sudden worsening of his health condition, which was presented with strong left flank pain. Abdominal contrast enhanced computed tomography raised suspicion on retroperitoneal hematoma. The patient underwent radical left nephrectomy and restarted peritoneal dialysis immediately after surgery. The patient was discharged 5 days after the operation without any complications. The pathology report showed papillary renal cell carcinoma. **Conclusion.** Although renal cell carcinoma is the most common malignant tumor of the kidney, it has been rarely presented with spontaneous subcapsular or perirenal hematomas. However, radical nephrectomy with retroperitoneal approach is a requirement for minimising damage as well as keeping peritoneum integrity, allowing the continuation of automated peritoneal dialysis immediately after surgery without complications.

Key words:
peritoneal dialysis; rupture, spontaneous; kidney neoplasms; nephrectomy.

Apstrakt

Uvod. Spontano nastali supkapsularni ili perirenali hematomi su retki, ali se veoma teško dijagnostikuju. Dat je prikaz prvog slučaja, opisanog u literature, uspešnog nastavka lečenja punim režimom peritoneumske dijalize, koja je bila započeta neposredno nakon urgentne nefrektomije urađene zbog spontane rupture karcinoma bubrega. **Prikaz bolesnika.** Muškarac, star 55 godina, lečen je kontinuiranom ambulatornom peritoneumskom dijalizom u trajanju od pet godina zbog terminalnog stadijuma bubrežne slabosti u čijoj je osnovi bila hipertenzivna nefropatija. Bolesnik je preveden na automatsku peritoneumsku dijalizu dva meseca pre iznenadnog pogoršanja koje se manifestovalo intenzivnim bolom u levoj lumbalnoj loži. Na osnovu nalaza kompjuterizovane tomografije abdomena sa kontrastom posumnjalo se na retroperitonealni hematom. Bolesnik je urgentno podvrgnut levoj radikalnoj nefrektomiji i u neposrednom postoperativnom toku lečenje je nastavljeno peritoneumskom dijalizom. Otpušten je petog dana nakon operacije, bez komplikacija. Patohistološki nalaz bioptata ukazao je na karcinom bubrežnih ćelija. **Zaključak.** Iako je karcinom bubrežnih ćelija najčešći maligni tumor bubrega, retko se prezentuje spontanim supkapsularnim ili perirenalnim hematomom. Radikalna nefrektomija sa retroperitonealnim pristupom uslov je za minimalno oštećenje i očuvanje integriteta peritoneuma, čime se omogućava nastavak automatske peritoneumske dijalize neposredno nakon operacije.

Ključne reči:
dijaliza, peritoneumska; ruptura, spontana; bubreg, neoplazme; nefrektomija.

Introduction

Spontaneous subcapsular or perirenal hematomas are relatively uncommon but often diagnostically challenging conditions. The appropriate treatment of such patients is based firstly on the diagnosis that a subcapsular or perirenal hemorrhage has occurred, and secondly, on the determination of its cause. An accurate diagnosis of the cause requires

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a combination of clinical information and radiologic imaging [1]. It is especially difficult when the patient is anuric and receive some renal replacement modality.

Case report

A 55-year-old male patient had received continuous ambulatory peritoneal dialysis (CAPD) for 5 years for end-stage renal disease (ESRD) secondary to hypertensive nephropathy. Patient was anuric for the longer period and his peritoneal dialysis (PD) prescription was adjusted to that condition. He was switched to automated peritoneal dialysis (APD) 2 months before sudden worsening of his health condition which was presented with left flank pain without other subjective symptoms. On the admission, the patient had normal body temperature, with mild atrial tachyarrhythmia and hypertension (150/90 mmHg) and had strong left flank pain with tenderness of the left renal lodge on the percussion, without any change in physical findings on other systems. On the admission, his laboratory findings revealed the following values: sedimentation (SE) – 80.0 mm/h, red blood cell (RBC) – 3.40 × 10^{12}/L, hemoglobin (HGB) – 100 g/L, white blood cell (WBC) – 15,96 × 10^{9}/L, granulocytes % (GRAN) – 89.8%, urea – 26.5 mmol/L, creatinine – 1396 umol/L, potassium (K) – 4.6 mmol/L, C-reactive protein (CRP) – 68.6 mg/L, procalcitonin (PCT) 0.36 ng/mL and leukocytes (Le) in the peritoneal effluent 0.00 × 10^{9}/L. Abdominal ultrasonografy showed right kidney of normal size, wavy contoured with reduced parenchymal thickness with a larger number of cortical cysts and enlarged left kidney – 147 × 84 mm in diameter, thickened hypoechogenic and slightly inhomogenic parenchyma.

On the basis of clinical, laboratory and ultrasound diagnosis, the patient was treated for acute pyelonephritis, and began treatment with dual parenteral antibiotic therapy: quinolones (ciprofoxacin 200 mg twice a day) and cephalosporins of III generation (ceftriaxon 2 g – once a day). Patient was performing his APD program by himself every night, without any changing in monitored parameters – ultrafiltration (UF), body weight (BW), arterial blood pressure (ABP), and without changing in pulse rate with completely cleared dialysis effluent. The pain ceased after 24 hours and after that patient complained only about great weakness. After two days, a repeated laboratory findings revealed a slight fall in RBC: 3.07 × 10^{12}/L, and HGB: 95 g/L and unchanged leucocytes WBC 16.63 × 10^{9}/l, GRAN 81.7% despite the applied antibiotic therapy. Antibiotic therapy was changed due to the inadequate response to therapy and meropenem 500 mg i.v. qd / 24 h was introduced. On the third day, the RBC significantly fell to 2.55 × 10^{12}/L and HGB: 75 g/L, so it arose suspicion on intra-abdominal hematoma development. Urgent abdominal contrast enhanced computed tomography (CECT) was done, which confirmed enlarged left kidney with inhomogeneous parenchyma and completely disrupted structure (Figures 1 and 2). The patient underwent left open radical nephrectomy by retroperitoneal approach and restarted PD immediately after surgery. The patient was discharged 5 days after operation without any complications. The laboratory finding on the discharge day were as follows: RBC: 3.00 × 1012/L, HBG: 87 g/L, WBC: 12.48 × 109/L, CRP: 145.2 mg/L, urea: 19.9 mmol/L, creatinine: 1088 umol/L, K: 4.4 mmol/L. The pathology report showed papillary renal cell carcinoma (RCC) (Figure 3).

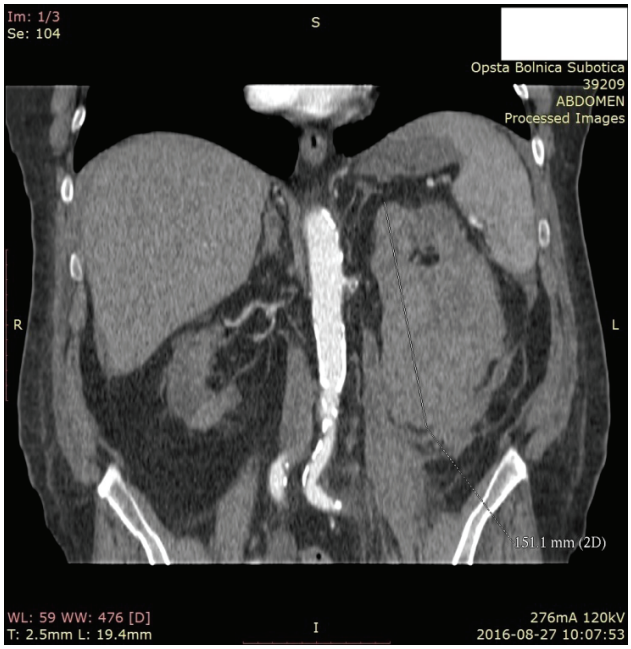

Fig. 1 – Abdominal computed tomography image (reconstruction): enlarged left kidney with longitudinal diameter 14 cm, erased cortico-medular line, completely disrupted structure, inhomogeneous density.

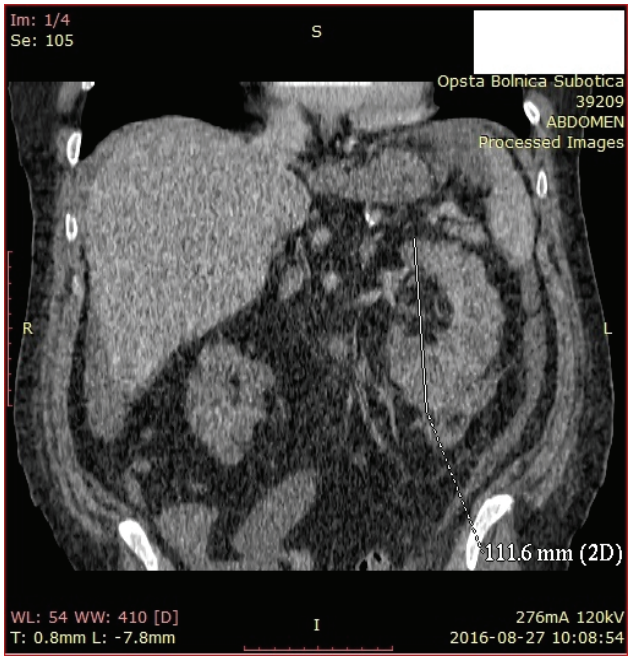

Fig. 2 – Abdominal computed tomography image: Retroperitoneal space on the left is entirely increased in density with hyperdense bands; the posterior part of the left pararenal space is fulfilled with inflammated-necrotic content of approximately 15 mm.

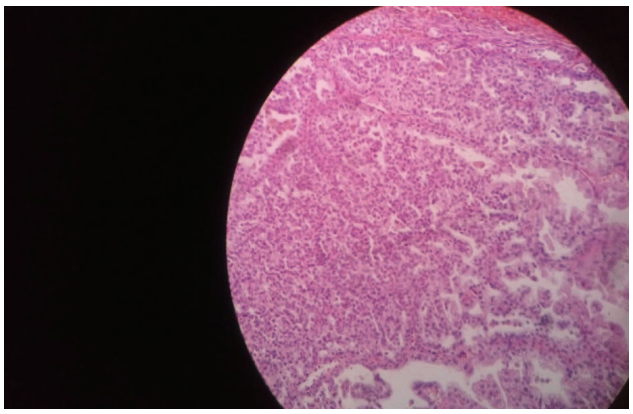

Fig. 3 – Microscopic view: papillary renal cell carcinoma, type 1 Fuhrman grade 2nd.

Discussion

Renal cell carcinoma is a rare, but serious complication in ESRD patients. The incidence of RCC is 20–40 times higher in these patients than in the general population [2]. Our patient had multiple risk factors for RCC: hypertension, tobacco smoking, obesity as well as pre-existing kidney disease and male gender [3]. RCC are usually discovered as 'incidentalomas' thanks to renal ultrasonography, which is responsible for 97% of the incidental diagnosis, in contrast to the classic presentation, as was the case with our patient [4]. Spontaneously ruptured RCC in ESRD patients is very rare and, to our knowledge, there are only 5 cases reported in the literature, all of which were in Japanese men [5, 6]. The spontaneous bleeding of the kidney (subcapsular and/or perinephritic space) was first described by Wunderlich. Wunderlich syndrome is described by the presence of Lenk's triad which manifests as acute flank/lumbar pain, palpable tender mass and features of active internal bleeding like hypotension, tachycardia and anemia. However, clinically, this triad is rarely seen and is commonly presented with abdominal pain (67%), hematuria (40%) and hypovolemic shock (26.5%) [7]. The clinical presentation in our patient was not so obvious, due to his having only abdominal pain from classical triad and the fact that the patient was anuric made the correct diagnosis more difficult. Most causes of Wunderlich syndrome are benign while neoplastic causes often accounted for in these cases, in different percentages to different authors. Moreover, the tumor size and rupture frequency were not correlated, and spontaneous renal rupture, even when tumor size was only 1 cm, was reported [8]. A possible mechanism underlying the spontaneous rupture of renal cell carcinoma was thought to be renal vein congestion due to tumor thrombosis, vessel rupture due to exponential tumor growth and direct invasion of the tumor into the renal vessels, but these are apparently not the major causes of ruptures [9]. Patohistological findings of renal biopsy verified the cause of spontaneous bleeding, which according to the available literature data is detected in 60% of all cases [10]. Therefore, the potential risk of an underlying renal tumor as a cause of spontaneous kidney rupture, should always be considered when making decision between a conservative and surgical therapy for these patients. Kendall et al. [11] proposed radical nephrectomy as the appropriate approach for treating these patients because there is a strong correlation between pararenal hemorrhage and small RCC.

Computed tomography (CT) is the most reliable modality in diagnosing retroperitoneal hemorrhage and RCC [12]. However, the efficiency of CT to diagnose RCC at the time of bleeding is an area of concern because of its inability to identify the RCC in 60% of cases, at the time of the initial CT [13]. In our case, tumor was not recognized as a cause of retroperitoneal hemorrhage before the operation. Nephrectomy can be performed by the transperitoneal or the retroperitoneal route [14]. The transperitoneal procedures can be troublesome for patients requiring PD. It is traditionally recommended that patients interrupt PD for at least 6 weeks after an open abdominal surgery to avoid complications and removal of the PD catheter, which may be required [15]. In that case temporary hemodialysis would be indicated with all risks of catheter related bacteriemia, infections and other complications [16]. Therefore**,** we made a decision to apply retroperitoneal approach which can minimize damage to the peritoneum and preserve its integrity [15].

Theoretically, a PD regimen can be restarted immediately after surgery, but there is little supporting evidence in the literature except for 3 patients who returned to PD after retroperitoneal radical nephrectomy, in a case report by Hsu et al. [15] with no negative effects on postoperative recovery. They referred that during postoperative care, the dialysate volume was reduced to about one half or two-thirds, and was titrated slowly upward according to patient's clinical condition. In the case of our patient, we applied the full CAPD regimen for the first postoperative day (Exreaneal® 2L during night started immediately after operation, followed with 2 exchanges with Dianeal® 2L 2.24% glucose, and with 2 exchanges with Dianeal® 2L 3.61% glucose, alternately), until evening of the first postoperative day when the patient himself started the whole previously prescribed APD regime on the second postoperative day (2 × 5 L + Extraneal 2 L, with filling volume of 1,700 mL). With intensive dialysis exchanges we achieved a satisfying depuration and ultrafiltration and we also enabled adequate volume loads for fluids and blood transfusion. The patient did not experience peritoneal leakage, poor wound healing, incisional hernia or impaired ultrafiltration after surgery. To our knowledge, our case report is the first one which describes open retroperitoneal radical nephrectomy in a patient with spontaneous kidney rupture, where the full CAPD and APD regime was started immediately after surgery.

Conclusion

There is a high risk of complications in immunocompromised patients such as patients treated with PD. Prompt selection of appropriate diagnostic procedures and surgical approach allows maintaining of the PD treatment modalities in these patients. We want to emphasize that in such patients RCC has more frequent occurrence and therefore they need

to have ultrasonography or CECT/nuclear magnetic resonance (NMR) control more often, indicated by their nephrologist. The aim of repeated controls is to discover this type of tumor on time, but not to wait for its spontaneous rupture on the background of previously undiagnosed and unrecognized RCC which has been developing over time.

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