Haemoperitoneum caused by bilateral renal cyst rupture in an ACKD peritoneal dialysis patient

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Introduction

Acquired cystic kidney disease (ACKD) can be developed during chronic renal insufficiency. The probability of developing cystic diseases rises with the increase of time in dialysis [1]. Men and African-American population are more likely to develop ACKD. Also, kidney volumes are bigger and cyst size increases faster in this population [1,2]. Typical complications of ACKD are intra- and pericystic bleeding as well as rupture with retroperitoneal haemorrhage. Patients with ACKD also present a higher risk of malignant transformation. Haemoperitoneum is an unusual complication in patients undergoing peritoneal dialysis (PD), most cases being attributed to mechanical, gynaecological or intra-peritoneal abdominal pathology. Haemoperitoneum, as a complication of renal cyst in autosomal dominant polycystic kidney disease (ADPKD), has been described only twice in patients on PD [3,4]. However, no previous cases were reported of ACKD.

This report describes one case of spontaneous bilateral cyst rupture with retroperitoneal haemorrhage and haemoperitoneum in a PD patient with ACKD.

Case report

A 37-year-old black man with end-stage renal failure caused by hypertensive nephropathy (diagnosed by renal biopsy) was first treated with haemodialysis for 5 years. The ACKD was diagnosed by a routine renal ultrasound examination after 4 years of renal replacement therapy (RRT). He was transferred to PD at his demand. The patient was totally anuric. He had a history of chronic hepatitis B and pericardial effusion caused by minoxidil treatment. After 5 months on PD he was admitted to the hospital because of an acute and sudden flank pain on the left side. This was a strong hollow pain which did not spread and continued for a few hours after the patient was admitted. No fever, vomiting or other symptoms were present at his admission. His blood pressure was 145/90 mmHg and the heart rate was 105 beats/min. Palpation of the left flank was very painful. The abdomen was non-tender and his peristalsis was normal. The entry zone of the peritoneal catheter showed no cutaneous irritation or signs of local infection and the patient’s dialysate fluid was clear. Blood analysis showed haemoglobin 14.1 g/dl and white blood cell count $7.2 \times 10^3/\mu l$. Coagulation and liver function tests were within the normal range. Ultrasonography showed a left kidney with a strong density of the renal parenchyma and multiple cyst formations, with a hyperechogenic area 6.1 cm in diameter. A CT scan was performed because of probable bleeding from an acquired cyst. The scan showed a dense perirenal collection of $6 \times 6$ cm in the left kidney with enlargement and heterogeneity of adjacent space and left iliac psoas muscle (Figure 1a). These findings were consistent with the presence of a large haematoma.

Meanwhile, haemoperitoneum was observed; blood pressure and haemoglobin fell (Hb 6.9 g/dl) and the patient’s clinical condition got worse, so an emergency left nephrectomy was performed. Macroscopic findings were a kidney with a weight of 261 g and a size of 12 cm in length, covered by coagula with ruptured renal capsule (Figure 2a). On the cross-section analysis, multiple cysts in the cortex and medulla could be seen with a diameter varying from 0.2 to 2 cm. No focus of neoplasia was found. After nephrectomy,
haemoperitoneum remitted and the patient recovered completely.

Thirty-one months later the patient was admitted to the hospital complaining of flank pain on the right side resembling nephritic colic pain. The pain began 12 h before admission. No fever, vomiting or other symptoms were present. Palpation of the right flank was painful and haemoperitoneum was present. Blood analysis showed haemoglobin 10.1 g/dl and white blood cell count 9.1 \times 10^3/ul. Coagulation and liver function tests were within the normal range. The abdominal CT showed multiple cysts in the right kidney with a perirenal haematoma of 8 cm and a haematoma of 13 cm in the iliac psoas space (Figure 1b). A right nephrectomy was performed. Macroscopic findings were a kidney with a weight of 218 g and a size of 11.7 cm in length covered by coagula with ruptured renal capsule (Figure 2b). On the cross-section analysis, multiple cysts replaced the renal parenchyma. The patient’s clinical evolution was similar to the previous admission, haemoperitoneum remitted and the patient recovered completely. He continues on PD.

**Discussion**

Our patient had a high risk factor to develop ACKD, due to the fact that he is a black man with long-term RRT. Moreover, previous renal ultrasound examinations, at the beginning of RRT and 2 years later, did not show renal cysts. Thus, ACKD is a well-established diagnosis in this case.

Intra- and pericystic bleeding and rupture with retroperitoneal haemorrhage are typical complications of ACKD. Sudden haematuria, anaemia or lumbar and flank pain can be reported in intracystic bleeding.

The main interest in this case lies in the presence of haemoperitoneum in both renal cyst ruptures. Haemoperitoneum in PD patients is often attributed to mechanical, gynaecological or intraperitoneal abdominal pathologies. Few cases have been described.
with retroperitoneal bleeding. This is not surprising because a retroperitoneal haemorrhage, in theory, should not find its way through the peritoneal membrane. A possible explanation is an adhesion between the cyst’s wall and the peritoneum, favoured by their anatomical proximity and inflammation secondary to intracystic haemorrhage. These adjoining structures could then rupture as a result of the rising intracystic pressure [5]. This mechanism would explain the delay, as it is well documented in our patient during the first renal rupture, between the onset of the pain and the observation of haemoperitoneum, as well as the fast remission after nephrectomy.

A second point of interest in this case is the fact that he had a bilateral renal rupture with retroperitoneal haemorrhage. Although this complication has been described in ACKD patients, its presence in both kidneys is rare.

Although unusual in haemoperitoneum cases, a complication of renal cyst should be taken into account, particularly in ADPKD and, as reported here, in ACKD patients.

Conflict of interest statement. None declared.

References

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