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Renal cell carcinoma associated with idiopathic thrombocytopenic purpura

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Abstract

We presented the clinical data of one patient with renal cell carcinoma associated with idiopathic thrombocytopenic purpura in this case report. We reported a 56-year-old man who presented with petechiae and ecchymoses. Laboratory studies showed the platelet count of 2×10^9/L and an abdominal computed tomography (CT) scan revealed tumors in the right renal. There were purpura on the legs and cough without abdominal pain and melena at this time. Idiopathic thrombocytopenic purpura was diagnosed according to the clinical symptoms and laboratory test. The patient received radical nephrectomy for renal carcinoma, and his idiopathic thrombocytopenic purpura was cured after the surgery. Pathological biopsy confirmed it was renal clear cell carcinoma. The patient has been followed up for more than 3 months after surgery, and the ecchymoses had not been recurred and the patient's thrombocytopenia was recovered. Idiopathic thrombocytopenic purpura associated with kidney cancer is rare. The patient in this case report was treated with radical nephrectomy, and the effectiveness of idiopathic thrombocytopenic purpura was satisfactory.

Keywords

idiopathic thrombocytopenic purpura, paraneoplastic syndromes, radical nephrectomy, renal cell carcinoma, treatment

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Introduction

Idiopathic thrombocytopenic purpura (ITP) is an acquired autoimmune disease that involves acute ITP and chronic ITP.[1,2] Acute ITP occurs more commonly in children with mucocutaneous hemorrhage, and the triggers of ITP include obscure, upper respiratory infection, virus infection, and vaccination. However, chronic ITP is most common in adults, especially in female adults, and it is manifested as mucocutaneous hemorrhage at the time of onset. The course of ITP is longer in adults than in children, and the outcome in adults is relatively severe.[1,2] The etiopathogenesis of ITP is related to immune disorder which produces platelet antibody and binds with platelet, resulting thrombocytopenia.[3–6] The ability of renal cell carcinoma (RCC) to express in many different ways is well known. Actually, one third of patients who suffer from RCC are without any of the ingredients of the diagnostic triad with flank pain,

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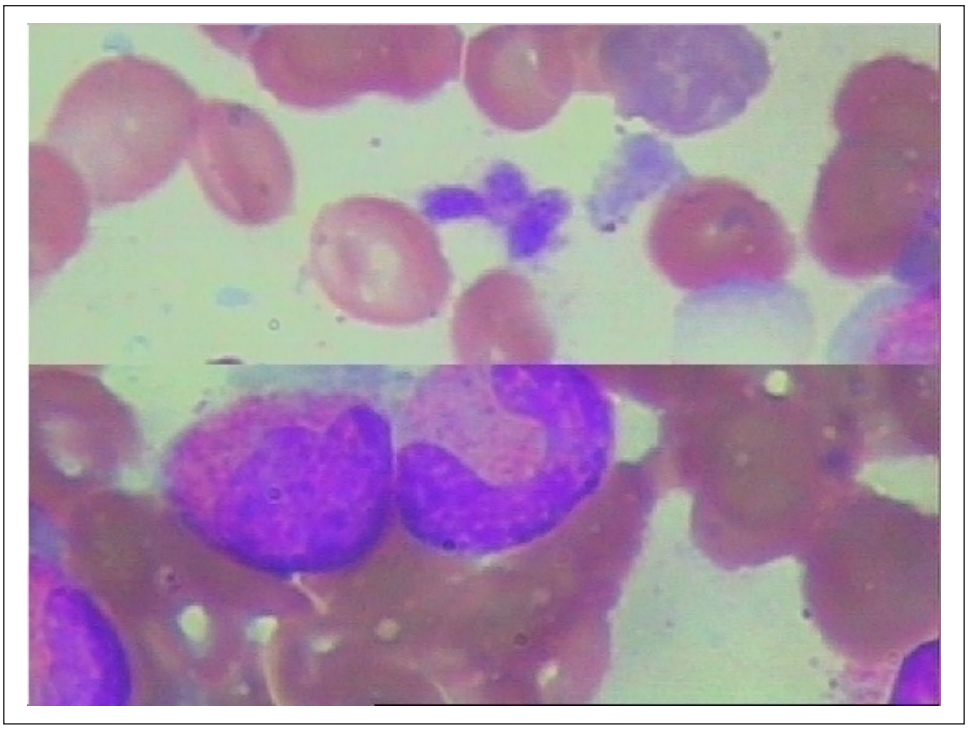

Figure 1. Bone marrow biopsy revealed a mass of megakaryocytes which were actively proliferated. Two platelet aggregation were noted.

palpable renal mass, and hematuria.[7,8] Oftentimes, the count of platelet is increased in patients with malignant tumor,[8] and certain researchers believe that the efficacy and prognosis in patients with RCC is affiliated to high platelet.[9] In addition, the development of RCC associated with ITP is very rare, and the cause remains elusive. Here, we reported a 56-year-old male with ITP and RCC, with the purpose of investigating whether ITP was the paraneoplastic syndromes in RCC and increasing the diagnosis consciousness and level.

Case report

A 56-year-old male was admitted to a local hospital because of ecchymosis that occurred primarily in the lower extremities and cough. Laboratory studies showed a notable thrombocytopenia with a platelet count of 2×10^{12}/L. The computed tomography (CT) scan of chest and abdomen revealed left lower lobe pneumonia and a 10-cm solid mass projecting from the right kidney. The diagnoses of idiopathic thrombocytopenia purpura, right renal mass, and left lower lobe pneumonia were made. After given therapy, including glucocorticoids, recombinant human interleukin 11 (IL-11), and etimicin, the condition had not changed to better after 2 weeks. Then the patient was transferred to Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine (Hangzhou, China). There was no palpable lymphadenopathy. The laboratory examination revealed a total leukocyte count of 8.1×10^{12}/L, a total red blood cell count of 3.99×10^{12}/L, hemoglobin level of 118 g/dL, and a platelet count of 59×10^{9}/L. The serology tests were all negative for hepatitis B virus, hepatitis C virus, HIV, and Epstein–Barr virus. Rheumatoid factor, antinuclear antibody, double-stranded DNA antibody, coagulation function, blood trace elements, and antiplatelet antibody were negative. Bone marrow biopsy revealed a mass of megakaryocytes, which were actively proliferated. Two platelet aggregations were observed (Figure 1). CT urography was performed after admission, and it revealed venous tumor thrombui of the right kidney and a space-occupying lesion with uneven enhancement in the right kidney, with 10.3 cm × 10.4 cm in size (Figure 2). A renal enhanced magnetic resonance imaging (MRI) scan revealed a large solid mass projecting from the right kidney with rich blood supply and venous tumor thrombui in the right kidney (Figure 2). A renal CT angiography (CTA) scan revealed renal venous tumor thrombui

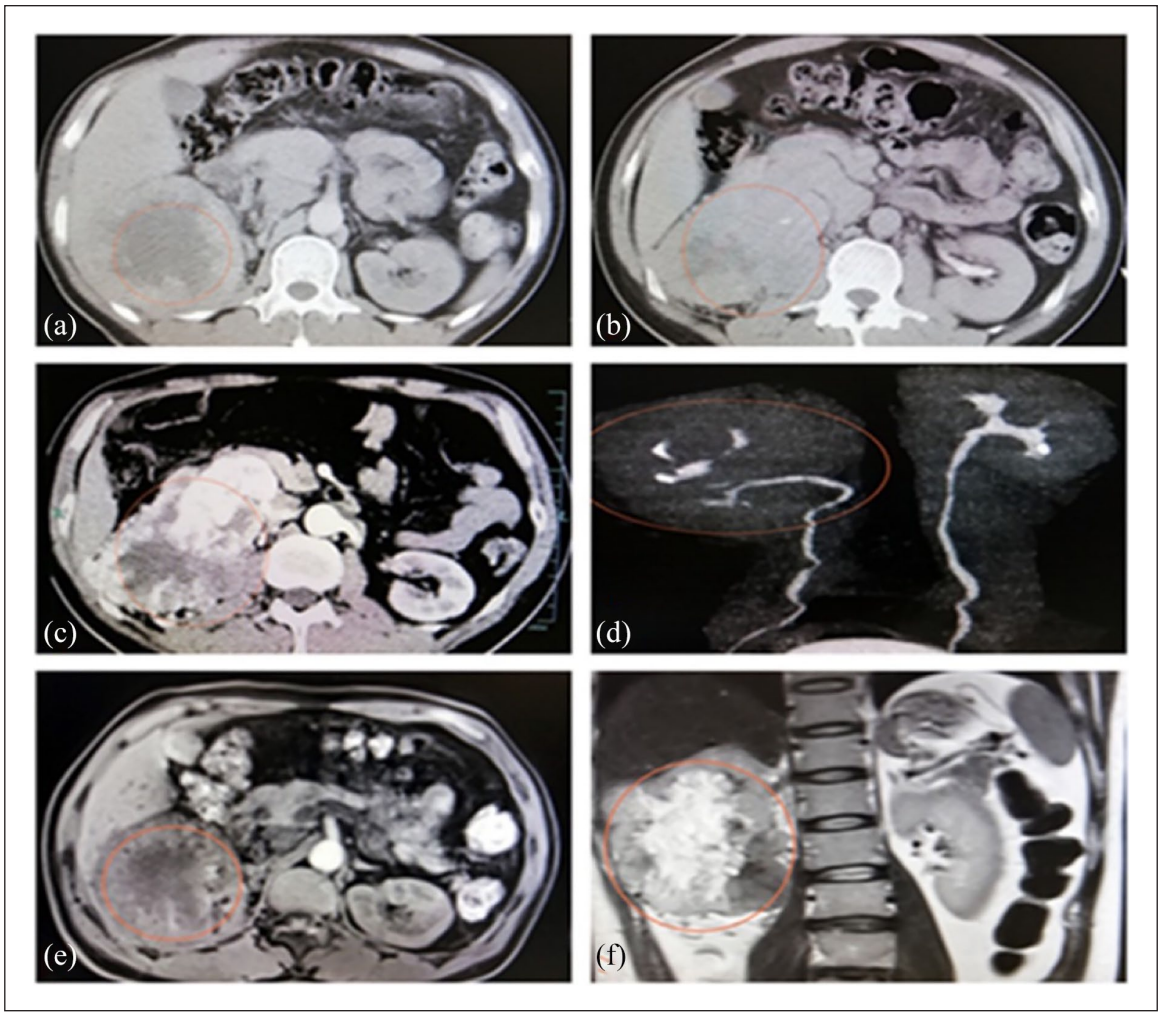

Figure 2. (a–d) CT urography revealed a tumor with uneven enhancement (red circle) in the right renal, measuring ~10.3 × 10.4 cm in size. (e, f) MRI revealed a large solid mass projecting from the right kidney with rich blood supply (red circle) and venous tumor thrombui in the right kidney.

and arteriovenous fistula of the right kidney (Figure 3). Renal artery ultrasound revealed that bilateral renal artery was negative and the right renal was swelling (Figure 3). There was no evidence of metastatic disease. After glucocorticoid injection and platelet transfusion, selective renal arterial embolization on the right kidney was performed prior to surgery. On 25 February 2019, retroperitoneal laparoscopic radical nephrectomy was performed. There were no enlarged lymph nodes, renal venous tumor thrombui, or evident extracapsular tumors. Formalin-fixed and paraffin-embedded tissues (FFPETs) were cut into 4-μm sections and stained with hematoxylin-eosin (HE) to evaluate the cell pattern. The sections were scanned under a light microscope, and images were captured at a magnification of 200×. Postoperative pathological diagnosis revealed a $11 \times 10.5 \times 10$ cm nodular mass with hemorrhage. In addition, tumor cells showed alveolar growth architecture and involved renal parenchyma without renal capsule or ureter, which confirmed the diagnosis of renal clear cell cancer of the right renal (Figure 4). The pathology also revealed necrosis area in tumor (Figure 4). The tumor was Fuhrman grade 3 and the pathological stage was I (T2bN0M0). Immunohistochemistry revealed CK (+), Vim (−), RCC (+), CD10(+), PAX-8(+), PAX-2(-), CD117(−), CK7(−), TFE3(−), Ki-67 (+) 5% (Figure 4). On the second day after surgery, the platelet count was increased to 96×10^9/L. At first week after resection, the platelet count was increased to 121×10^9/L and continued to maintain within the normal range during 3 months of follow-up.

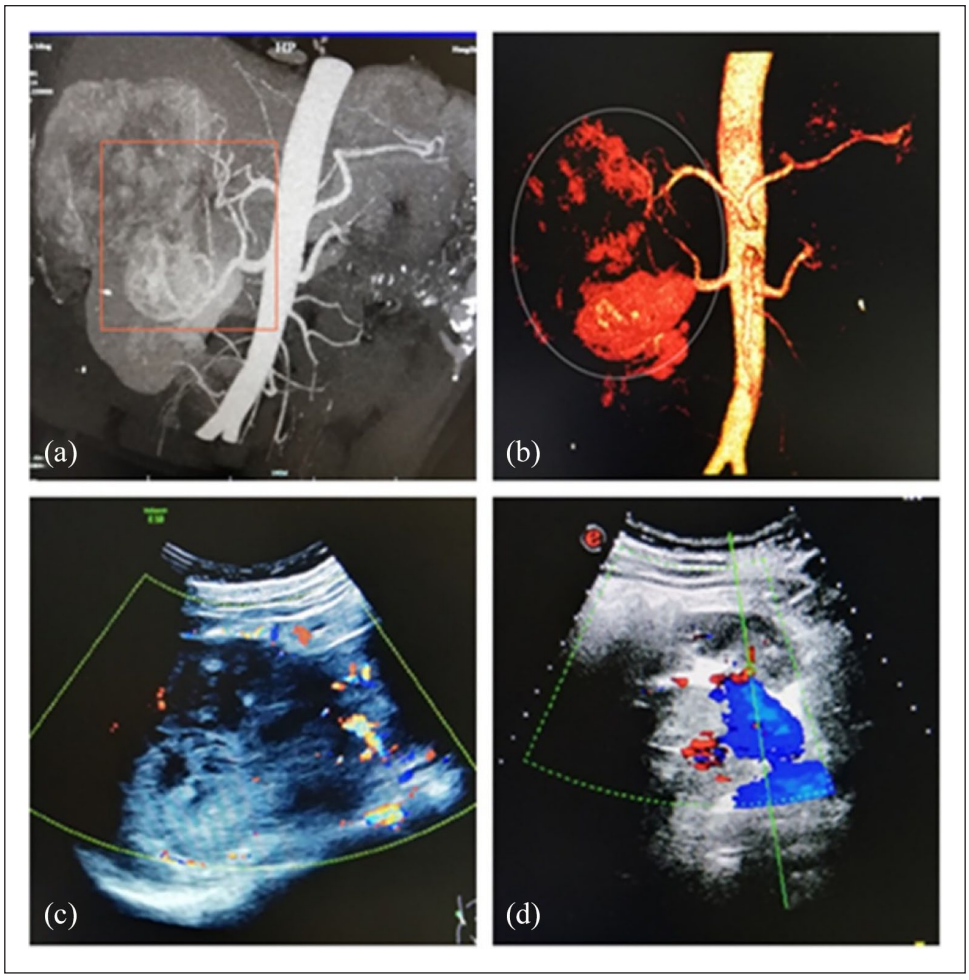

Figure 3. (a, b) CT angiography scan revealed renal venous tumor thrombui and arteriovenous fistula of the right kidney (red symbol). (c, d) Renal artery ultrasound revealed bilateral renal artery presenting negative and swelling of the right renal (rheography).

Discussion

ITP is an acquired autoimmune disease which presents mucocutaneous hemorrhage. The mechanism of secondary ITP remains elusive, but it is thought to be identical to that of primary ITP. The diagnosis of ITP is (1) thrombocytopenia, (2) normal or increased megakaryocytes by bone marrow biopsy, (3) exclusion of other causes of thrombocytopenia, including disseminated intravascular coagulation (DIC), drug-induced, and hypersplenism. ITP is reported in approximately 1 per 50,000 adults with the average age of 50 years.[1] ITP occurs more commonly in children and females who were in childbearing age. The prognosis in adults is relatively poor, and the course is more chronic.[1,2]

Kidney is both an important metabolic organ and endocrine organ. The incidence of ITP in patients with extrarenal manifestations, namely paraneoplastic syndromes, is approximately 20%. The symptoms of paraneoplastic syndromes include a high erythrocyte sedimentation rate, fever, hypertension, hypercalcemia, polycythemia, abnormal liver function, and anemia. These symptoms will get to normal after excision of primary lesion.[10] Moreover, paraneoplastic syndrome has been found in patients with RCC, despite the tumor burden, and exists in equal frequency among localized and metastatic diseases.[10] This suggested that the tumor biology was the source of paraneoplastic syndrome, but not the extent of the tumor.

Certain researchers reported lots about patients with RCC with thrombocytosis. They suggested that the platelet count is increased in patients with malignant tumor, and the efficacy and prognosis in patients with RCC is affiliated to high platelet count.[9] On the contrary, the development of RCC

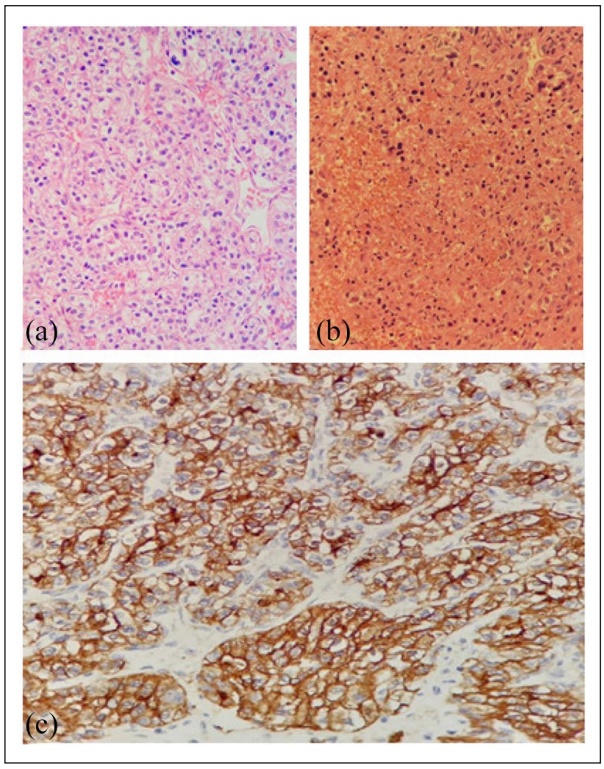

Figure 4. (a) Pathology confirmed a diagnosis of renal clear cell cancer of the right renal and the tumor was a Fuhrman grade 3. The tumor cells showed alveolar growth architecture (staining, H&E; magnification, 200×). (b) Pathology revealed necrosis area in the tumors. (c) Immunohistochemistry revealed CD10 (+).

combined with ITP is very rare. Symbas et al.[9] reported the incidence of RCC combined with thrombocytosis was approximately 56.8%. Kim and Boggs reported a succession of 10 patients with various forms of cancer with ITP in 1979.[11] However, RCC with thrombocytopenia is very rare. Klimberg and Drylie reported patients with RCC combined with ITP in 1984 for the first time.[12] Yoshinaga et al.[13] reported a female patient with ITP and RCC in 2005; the patient's platelet count was gradually increased after the renal being removed. Florcken et al.[14] reported a female patient with metastatic RCC combined with thrombocytopenia in 2009, and bone marrow aspiration revealed that bone marrow was involved extensively, and the prognosis of the patient was poor. The reason may lie in tumor cells providing some substances which can cause platelet aggregation for the platelet destruction in patients with solid tumors and thrombocytopenia.

The diagnosis of ITP combined with RCC is one of exclusion, requiring to exclude other causes of thrombocytopenia. There was no obvious infection, medication history, family history, joint pain, and other rheumatic system–related manifestations in the patient at the first visit. The platelet of the patient was 2×109/L at the time of admission. Bone marrow puncture showed a mass of megakaryocytes which were actively proliferated. Two platelet aggregations were noted. Therefore, the patient was diagnosed with ITP. In this patient, the platelets were not significantly increased after the treatment of internal medicine. The platelets were significantly higher after the operation than when he was admitted to the hospital. The fluctuation of platelets was 90–117 g/L half a year after the operation. Considering the renal cancer, it can alleviate the ITP to some extent.

However, the drug therapies used in our case report did not include immunosuppressive medication, and there was no evidence of virus infection or DIC. Bone marrow biopsy revealed a mass of megakaryocytes, which were actively proliferated. Two platelet aggregation were noted. A 56-year-old male was admitted to our hospital due to ecchymosis that occurred primarily in the lower extremities, without symptoms of renal carcinoma. The therapy for this patient included glucocorticoid injection and platelet transfusion, but the condition had not changed to better. After surgery of radical nephrectomy, he recovered from thrombocytopenia, and the platelet count continued to be maintained within the normal range during 3 months of follow-up. Therefore, we regarded this case as a secondary ITP combined with RCC, which was a paraneoplastic syndrome. Accordingly, we can consider the secondary thrombocytopenia is associated with tumor, although there is no evidence to support the cause of thrombocytopenia when the patient has thrombocytopenia combined with tumor.

The treatment contains primary tumorectomy, steroid administration, chemotherapy, radiotherapy, immune therapy, or splenectomy in patients with paraneoplastic ITP[10]. Especially, the platelet count tended to increase within the normal limits only through radical nephrectomy for RCC.[10] On account of the high surgical risk in RCC patients with thrombocytopenia, patients are usually treated with steroids prior to surgery. The patient in our case report was treated with glucocorticoid injection prior to surgery, and this present case supports the viewpoint of Krauth MT. Furthermore, we can choose steroid therapy, including molecular targeted therapy, for patients with metastatic tumors.[10]

Conclusion

In conclusion, a review of the current literature indicated that the occurrence of ITP combined with RCC was relatively rare, and its cause was elusive. We should consider the possibility of secondary thrombocytopenia combined with malignancy when the therapy of solid tumor associated with ITP containing glucocorticoid injection and platelet transfusion was not effective, and the optimum treatment of ITP combined with malignancy is operating primary tumor. To reduce the operation risks, selective renal arterial embolization on the kidney is also an awesome choice prior to surgery.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval and informed consent

All procedures were performed in accordance with the Declaration of Helsinki of the World Medical Association. The scheme was authorized by Ethics Committee of Affiliated Hangzhou First People's Hospital, Zhejiang University School of Medicine. Our institution does not require ethical approval for reporting individual cases or case series. Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article

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