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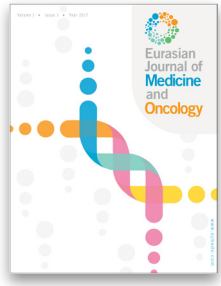

Case Report

A Rare Cause of Acute Kidney Injury: Renal Arterial Thrombosis in a Small Cell Lung Cancer Patient

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Abstract

Renal artery thromboembolism is a rare cause of acute kidney injury. Hypercoagulable state is an important reason renal arterial thrombosis may occur. Cancer cells activate coagulation systems via various pathways, leading to the development of a prothrombogenic state. Presently described is the very rare condition of renal artery thromboembolism in a patient with extensive-stage small cell lung cancer.

Keywords: Acute kidney injury, renal arterial thrombosis, small cell lung cancer

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Venothrombosis develops in 4% to 20% of cancer patients and is an important cause of morbidity and mortality.[1] Studies have suggested a 4-fold greater incidence of venothrombotic events (VTE) in cancer patients than in the general population.[2] Tumor cells can cause procoagulant activity. It has been suggested that tumoral expression of blood-borne tissue factor is responsible for the pathogenesis of the hypercoagulable state in malignancy.

In addition, cytotoxic drug-related thrombosis can occur with some drug regimens.[3, 4] The risk of therapy-related VTE is 6.5-fold that of the non-cancer population.[5] Cisplatin-related thrombosis is controversial.[6] Cisplatin has an additive effect in combination with gemcitabine, resulting in the highest rates of VTE.[7] In a meta-analysis, cisplatin regimens were identified as small risk factor for venous thrombosis, but not for arterial thrombosis.[8]

Renal artery thromboembolism is a rare cause of acute kidney injury (AKI). It is necessary to consider if there is a high suspicion of thrombosis in cancer patients with AKI. This report is a description of the very rare instance of renal artery thromboembolism in a patient with extensive-stage small cell lung cancer.

Case Report

A 53-year-old male patient had been diagnosed with extensive-stage small cell lung cancer (SCLC). His medical history was otherwise unremarkable. Only 2 cycles of chemotherapy with cisplatin plus etoposide had been administered, and the last treatment had taken place about 1 week prior to the patient presenting at the emergency department with left flank pain and generalized weakness ongoing for 2 days. He was in pain and looked markedly dehydrated. Physical examination yielded positive test for left costo-vertebral angle tenderness. In addition, abdominal examination revealed tenderness on palpitation in the left upper quadrant, with no guarding or rebound. There was no organomegaly and remainder of examination was normal. Laboratory evaluation reported macroscopic hematuria, leukocytosis, creatinine level of 1.8 mg/dL (normal range: 0.72–1.25 mg/dL), elevated lactate dehydrogenase (LDH) level of 2590

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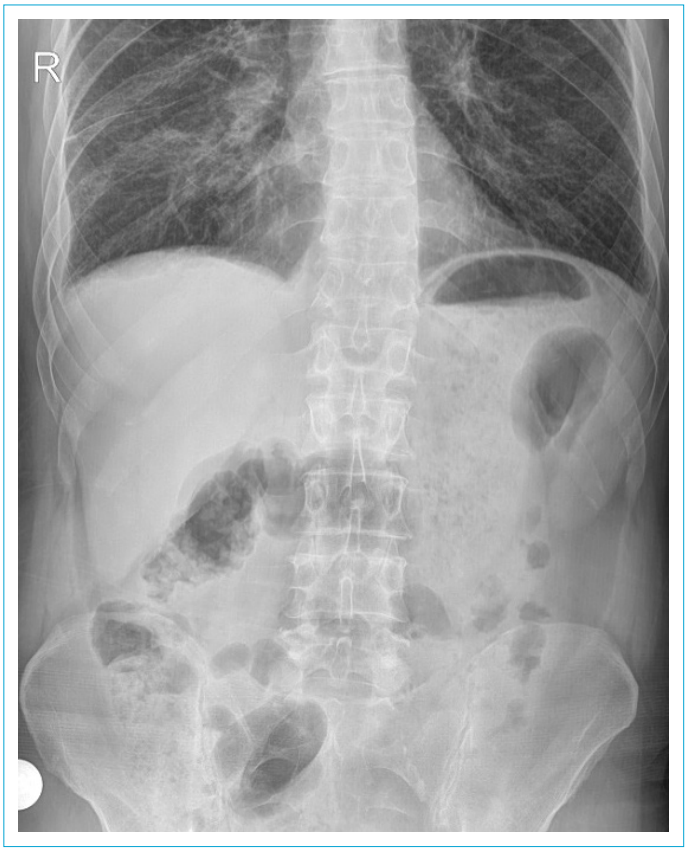

Figure 1. Abdominal radiography indicated no nephrolithiasis.

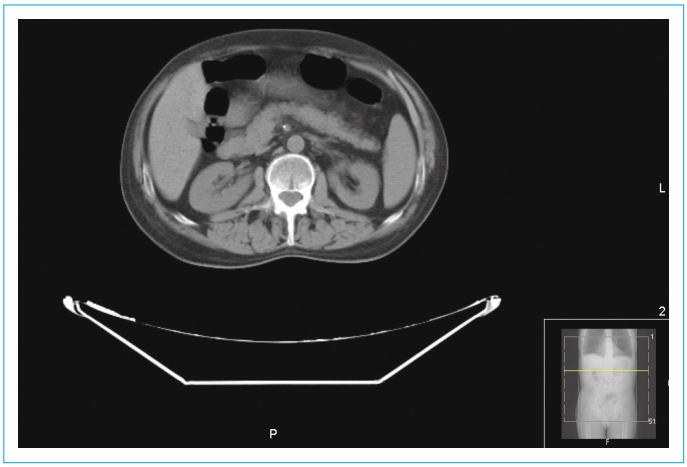

Figure 2. Non-contrast spiral computed tomography was performed to detect presence of a renal stone.

U/L (normal range: 0–247 U/L), and aspartate transaminase (AST) level of 185 U/L (normal range: 0–50 U/L). After clinical assessment, nephrolithiasis and acute vascular complication were evaluated as possible reasons for the acute pain, due to history of malignancy and macroscopic hematuria. Radiography of the abdomen (Figure 1) and non-contrast computed tomography (CT) were performed for differential diagnosis of nephrolithiasis (Figure 2). No sign of nephrolithiasis or hydronephrosis was observed. Renal arterial Doppler ultrasonography indicated remarkable decrease in renal artery inflow. Contrast-enhanced CT revealed thrombus in the left renal artery with multiple infarcts (Figures 3, 4). A urologist and a vascular surgeon evaluated the case and recommended conservative treatment with anticoagulation. The patient was admitted to the oncology service. The patient consent form was approved.

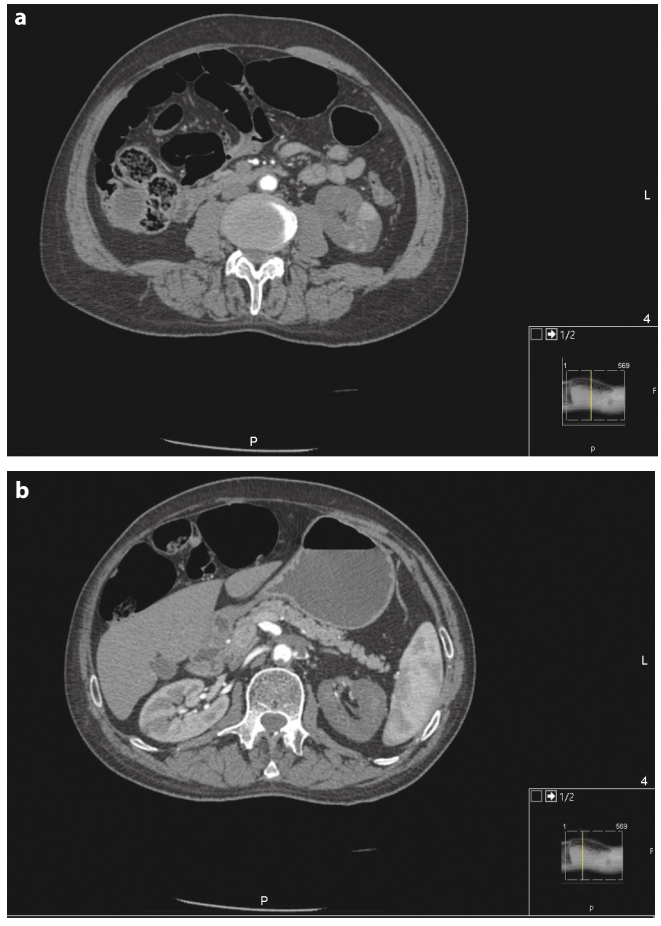

Figure 3a, b. Contrast-enhanced spiral computed tomography image demonstrating left renal artery obstruction: no blood flow distal to thrombosis and left kidney ischemic change.

Discussion

Major causes of renal infarction include cardiac arrhythmia and renal artery injury. One of the other reasons renal arterial thrombosis may occur is a hypercoagulable state. Cancer cells activate coagulation systems via various pathways, leading to the development of prothrombogenic states. The presence of thrombosis in a patient with cancer leads to a poor prognosis; however, there is not enough data about renal artery thromboembolism in patients with SCLC.

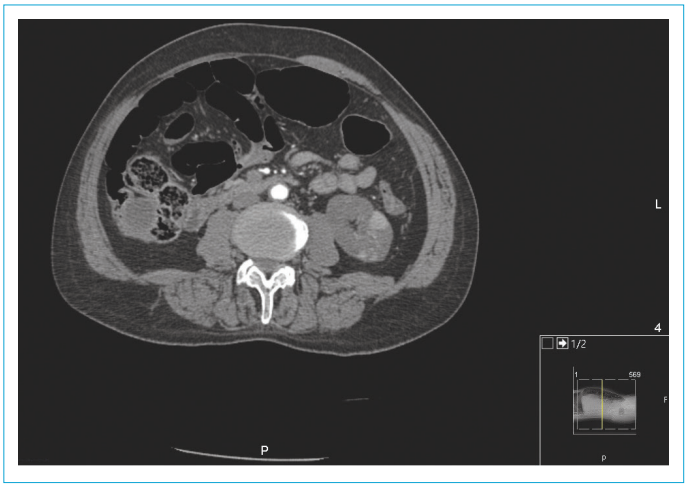

Figure 4. Lower lobe of the left kidney with multiple patchy infarct areas.

Chemotherapy-related thrombosis is recognized, and cisplatin-induced vascular thrombosis has been demonstrated in some papers.[3, 6, 8] Our patient had been treated with 2 cycles of a cisplatin combination regimen. It is important to differentiate the possible contribution of a drug. In a meta-analysis, cisplatin-induced thrombosis was associated only with venous thrombosis, not arterial thrombosis; however, we suggest that the thrombosis in our patient was cisplatin-related.

The association of cancer with thromboembolic events has been clinically proven. Sørensen et al. reported that among patients who experienced a VTE, about 78% had previously been diagnosed with cancer. The 5 most common types of cancer diagnosed at the time of venous thromboembolism were lung (17%), pancreatic (10%), colorectal (8%), renal (8%), and prostate (7%).[9]

Clinical presentation of acute right or left flank pain and hematuria with decreased renal function are signs to evaluate vascular condition in a patient with malignancy. One of the major supporting laboratory findings is a remarkably elevated LDH level (in particular >1000 U/L).[10] In addition to an LDH increase, a small rise or normal level of serum aminotransferase is a strongly suggestive finding of renal vascular obstruction.[11] Our case may be seen as easy to diagnose. A non-contrast spiral CT is important to exclude nephrolithiasis and, if negative, a contrast-enhanced spiral CT should be considered to evaluate for vascular obstruction. The treatment of renal infarction is controversial as it may be unclear the underlying cause is clot emboli or renal artery thrombosis. We started anticoagulation with low-molecular-weight heparin. It has been suggested that anticoagulant treatment may improve the clinical outcome (overall survival or disease-free survival) in patients with SCLC.[12]

In conclusion, this case has demonstrated that renal infarction should be strongly considered when presented with the following triad: persistent abdominal and/or flank pain, elevated serum LDH and/or hematuria in patients with malignancy. It can easily be missed on presentation; however, if overlooked, the clinical course may result in greater mortality.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

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