Case Report

Multiple Pulmonary Emboli as a Primary Presentation of Renal Cell Carcinoma

Abstract

A 57-year-old housewife presented with complaints of sudden onset of chest pain and dyspnea. Computed tomography angiography revealed saddle-shaped pulmonary emboli in the main pulmonary artery and its branches. Evaluation for the cause of pulmonary embolism revealed a heterogeneously enhancing lesion arising from the anterior aspect of the lower pole of the left kidney. She had no hematuria, flank pain, or any palpable abdominal mass. She underwent a left open radical nephrectomy with inferior vena cava thrombectomy. Given that only 10% of patients present with the classic triad, it is often difficult to diagnose renal cell carcinoma in the early stages. Therefore, a high index of suspicion in patients with atypical presentations can lead to an early diagnosis.

Keywords: *Computed tomography angiography, pulmonary embolism, renal cell carcinoma*

Amit Mandal, Nihal Thomas[1]

Department of Cardiology, Christian Medical College, [1]Department of Endocrinology, Diabetes and Metabolism, Christian Medical College, Vellore, Tamil Nadu, India

Introduction

Patients with renal cell carcinoma (RCC) can present with a variety of symptoms, including flank pain, hematuria, and a palpable abdominal renal mass. However, in a majority of cases, these classic symptoms are absent until the disease has advanced.

Pulmonary embolism is a potentially fatal complication of deep-vein thrombosis. RCC is occasionally associated with pulmonary embolism, which may occur secondary to a hypercoagulable state or cancer-associated emboli. We present a case of a 57-year-old housewife who developed sudden onset of chest pain and dyspnea. Following a detailed evaluation, she was diagnosed with pulmonary embolism, which led to the detection of RCC.

Case Report

A 57-year-old housewife presented with complaints of sudden onset of chest pain and dyspnea. The medical history of the patient was unremarkable with no history of trauma, no family history of renal tumors, and no symptoms of hematuria, flank pain, or palpable abdominal mass. The patient was not a smoker. On examination, her blood pressure was 110/70 mm Hg in the right upper limb, pulse rate was 128 beats/min, respiratory rate was 32 breaths/min, and saturation on room air was 80%. Her systemic examination was unremarkable.

Differential diagnosis

The patient presented with sudden onset of chest pain and dyspnea. She had tachycardia with tachypnea with hypoxia with unremarkable systemic examination. The differential diagnoses considered were acute coronary syndrome or pulmonary embolism.

Investigations

Her investigations are listed in Table 1. Her Electrocardiogram (ECG) showed sinus tachycardia with the S1Q3T3 pattern [Figure 1], and emergency ECHO revealed dilated right atrium (RA)/right ventricle with dilated inferior vena cava (IVC) dilated with <50% inspiratory collapse [Figure 2].

Furthermore, computed tomography angiography revealed saddle-shaped pulmonary emboli in the main pulmonary artery and its branches, extending into the segmental and subsegmental branches [Figure 3], prompting a diagnosis of pulmonary embolism.

In general, 70% of pulmonary emboli occur as a result of lower-limb deep-vein

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Address for correspondence:
Dr. Amit Mandal, Christian Medical College, Vellore, Tamil Nadu, India.
E-mail: amit.mandal78@yahoo.co.in

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thrombosis. However, the lower limb Doppler study of our patient did not show any evidence of deep-vein thrombosis.

Routine abdominal ultrasonography revealed a substantial heterogeneous, and hypoechoic lesion, and subsequent 18F fluorodeoxyglucose positron emission tomography CT revealed a heterogeneously enhancing lesion arising from the anterior aspect of the lower pole of the left kidney [Figure 4]. Her magnetic resonance imaging of the kidney revealed a well-circumscribed exophytic left renal lower pole heterogeneous mass with central areas of necrosis with tumor extension into the left renal vein and minimally into the short segment of the infrahepatic IVC [Figure 5].

Treatment

Based on imaging features, she was diagnosed with a left renal lower pole type RCC with tumor thrombosis filling and distending the left renal vein and the short segment of the infrahepatic IVC (T3N0M0) with acute pulmonary thromboembolism.

She was initiated on therapeutic anticoagulation with low molecular weight heparin and subsequently underwent left open radical nephrectomy with IVC thrombectomy under general anesthesia. She had an uneventful recovery after surgery and was stable at discharge and doing well at 6 months of follow-up.

Table 1: Lab investigations

Investigations	Results	Normal values
Haemoglobin (g/L)	15.2	14–17
Total count(×109/L)	19700	4.5–11.0
Differential count(%)	NE: 81, LY: 15, MO: 4, EO: 2, BA: 0	
NE: Neutrophils, LY: Lymphocytes, MO: Monocytes, EO: Eosinophils, BA: Basophils		
Platelet count(×109/L)	274000	150–350
HIV, HBV, HCV serology	Negative	
Serum sodium (mmol/L)	140	135–145
Serum potassium (mmol/L)	4.6	3.5–5
Serum creatinine(µmol/L)	97.26	38–106
Total and direct bilirubin(µmol/L)	1.1 6/0.61	5-21/1.7–5.1
Serum total protein/albumin (g/L)	60/38	60-80/35-50
Serum aspartate aminotransferase (U/L)	426	10–35
Serum alanine aminotransferase (U/L)	222	10–40
Serum alkaline phosphatase (U/L)	106	30–120
Prothrombin time	15	11.7-16.1
INR	1.22	
APTT	34.9	27.8-40.4
Calcium (mg%)	8.1	8.3-10.4
TROPONIN i (ng/ml)	0.59	0.04

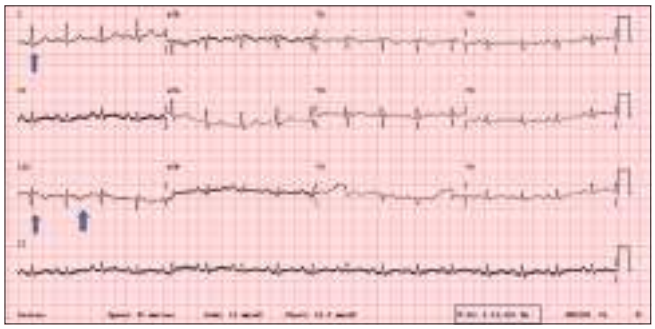

Figure 1: Electrocardiogram showing S1Q3T3 pattern

Discussion

Patients with RCC can present with a variety of symptoms, the classic triad being flank pain, hematuria, and a palpable abdominal renal mass. However, the presence of the classic symptoms usually reflects an advanced disease, and it is seen only in 9% of patients with RCC.[1] As the early symptoms of RCC are uncharacteristic, it may often lead to misdiagnosis.[2] In our case, the patient did not have typical symptoms of RCC, and her index presentation was symptoms of pulmonary embolism. Malignancy is one of the important causes of pulmonary embolism. Previous studies have demonstrated that at 5–10-year follow-ups, 10% of patients with unexplained pulmonary emboli were diagnosed with malignant tumors.[3,4]

RCC with massive pulmonary tumor embolism has been reported only in a few case series. Pulmonary embolism in RCC patients is generally identified intraoperatively.[5] A total of 4–10% of patients with RCC present with venous tumor thrombi, increasing the patient's risk of distal embolism,[6] wherein 1% of them extend into the RA.[7]

In summary, RCC is a common malignant tumor that involves the urinary tract system with a high mortality rate. Considering that only 10% of patients present with the classic triad of RCC, a diagnosis of RCC at an early stage is often difficult. Hence, physicians should pay extra attention to patients presenting with unrepresentative

Figure 2: Blue Arrow showing dilated RA/RV in ECHO

Figure 3: computed tomography angiography (CTA) (Red Arrow)showing saddle-shaped pulmonary emboli in main pulmonary artery and its

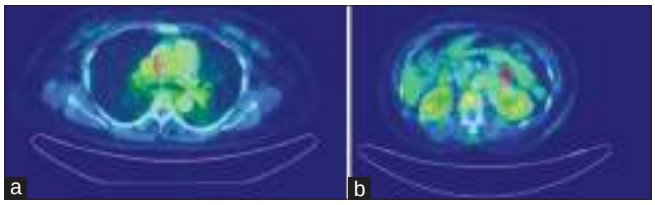

Figure 4: FDG PET (Red Arrow) showing, (a) saddle-shaped pulmonary emboli (b) lesion in lower pole of left kidney

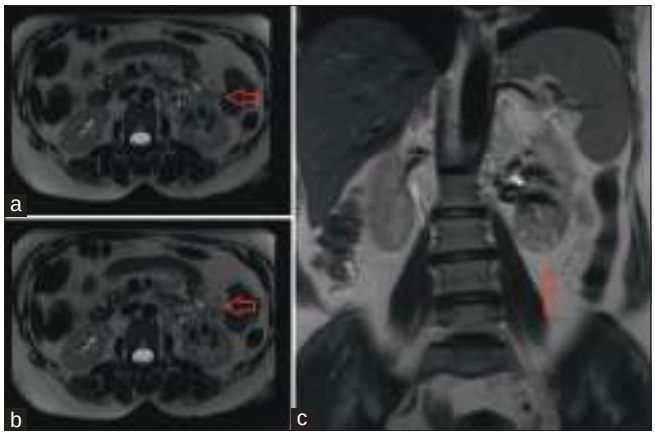

Figure 5: (a-c) MRI views (Red Arrow) showing left renal lower pole mass with central necrosis

symptoms and consolidate the early screening process for RCC based on better imaging modalities.

Learning points

- Patients with RCC can present with a variety of symptoms; however, the presence of classic symptoms is seen in only 10% of patients
- Massive pulmonary embolism as an index presentation of RCC is unusual
- A high index of suspicion is required for diagnosing a patient presenting with RCC with atypical symptoms.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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