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Case Report

Concomitant Spontaneous Hemothorax and Perinephric Hematoma: Rare Presentation of Renal Cell Carcinoma

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Abstract:
Spontaneous hemothorax and perinephric hematoma are rare presentations of renal cell carcinoma. We present the case of a 30-year-old female who presented with progressive fatigue and weight loss over a 2-month period. Initially, she was suspected to have empyema and received anti-tuberculosis therapy at a local hospital. However, further evaluation revealed a low hemoglobin level and a CT scan showed a right renal mass with lung metastasis, along with massive hemothorax, perinephric, and retroperitoneal hemorrhage. She underwent surgical management with radical nephrectomy and evacuation of the hematoma. Pathological examination of the surgical specimen confirmed renal cell carcinoma. After treatment, the patient was discharged in stable clinical condition.

***Keywords**: Perinephric hematoma, hemothorax, renal cell carcinoma, case report*
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Introduction

Isolated perinephric hematoma and hemothorax can arise from various underlying clinical conditions (1). Concurrent presentation of spontaneous hemothorax and perinephric hematoma is reported following treatment with anticoagulants and it is a very rare entity in renal cell carcinoma. Metastatic renal cell carcinoma most commonly presents with solitary or multiple lung nodules followed by bone, lymph node and liver metastasis (2). This case highlights a rare presentation of concurrent perinephric hematoma and hemothorax in a patient with renal cell carcinoma (RCC).

Case presentation

A 30-year-old female patient arrived at the emergency department complaining of shortness of breath and easy fatigability of one day duration. She had been previously admitted to another hospital a month and two weeks prior with a history of cough, significant weight loss, and easy fatigability that persisted for over a month. Before her transfer to our institution, she had received 4 units of packed red blood cells (RBC) and had started anti-tuberculosis treatment with presumptive diagnosis of TB empyema. Despite this treatment, her weight loss continued to progress, and she showed no response to the anti-TB regimen. Consequently, she was referred to our hospital for decortication of the right-sided loculated collection.

Upon admission, the vital signs were mildly deranged with respiratory ate of 28 breaths/min and oxygen saturation of 80-85%. Blood pressure was 100/70 mmHg, pulse rate of 90 beats/min and Temperature of 36.5°C upon initial evaluation. She was given intra-nasal oxygen and the oxygen saturation was corrected. On general physical examination she had absent air entry in the right lower two thirds of the chest. Her baseline complete blood count (CBC) showed mild anemia with hemoglobin of 10.0 g/dL, with other CBC parameters within normal limits. Urine analysis showed microscopic hematuria. Organ function tests and coagulation profile were within normal limits.

To better evaluate the right pleural cavity collection, a chest CT scan was performed. It revealed a massive hematoma in the right pleural cavity with multiple bilateral lung nodules. An attempt was made to insert a chest tube to evaluate the hematoma, but it was unsuccessful and the patient was transferred to the surgical ward for further management. After admission, her fatigue worsened and she developed vaginal bleeding, hematuria, and right upper quadrant pain. An abdominopelvic ultrasound showed an empty uterus with a right renal

mass, along with perinephric and retroperitoneal collection. A cystoscopy evaluation revealed the bladder lumen was full of clot. She received multiple transfusions of packed RBC.

Following the abdominal ultrasound findings, an abdominopelvic CT with renal protocol was performed, which showed a right renal mass with perinephric and sub-capsular hematoma extending into the pelvic retroperitoneal space. The main renal vessels were normal, and no extravasation was observed on the delayed image.

Due to progressive bleeding and a decline in her hematocrit level, she underwent surgery. Intraoperatively, hematoma adherent to the liver and the duodenum was found, along with a deep parenchymal laceration at the upper pole and a solid renal mass measuring 5cm x 6cm x 7cm. Hematoma evacuation and nephrectomy were performed, with the patient receiving 1 unit of blood transfusion during the procedure. Tissue sample for biopsy was taken the patient was transferred to the ward in stable condition. The biopsy finding revealed a clear cell type of renal cell carcinoma.

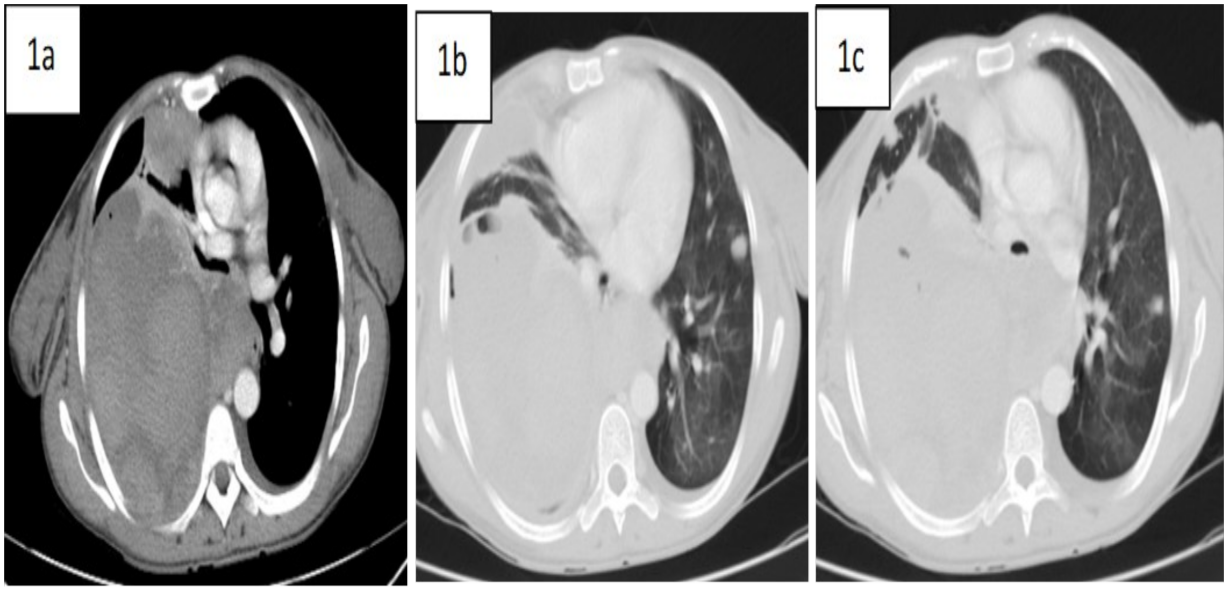
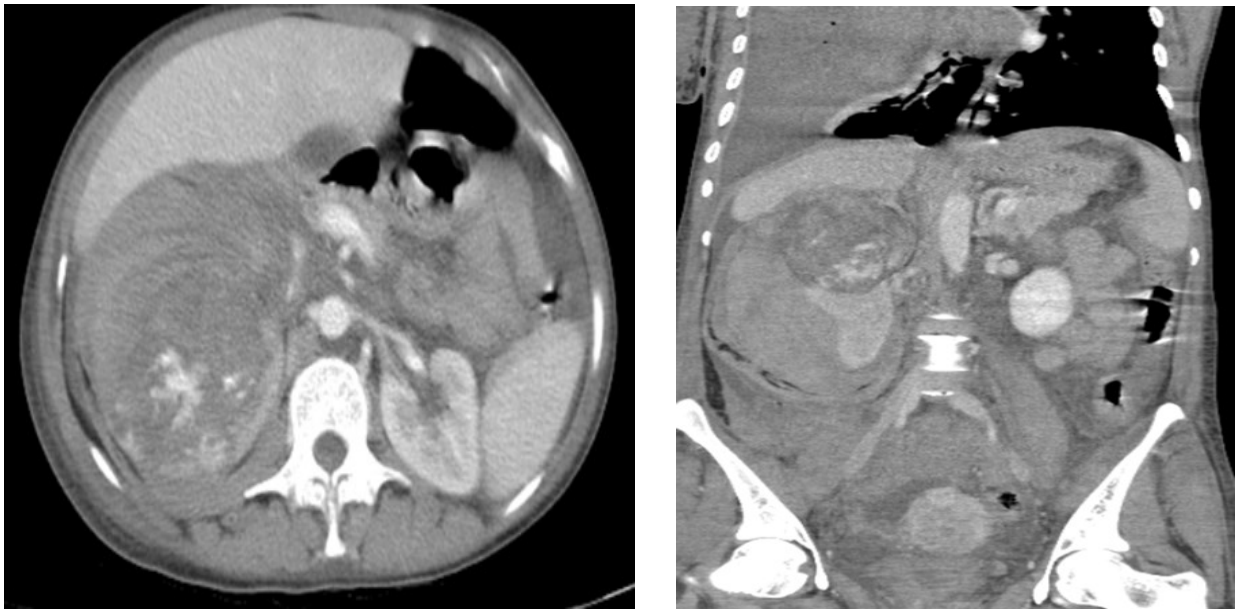


Figure 1: 1a) Post-contrast axial CT of the patient shows a heterogeneous hyper-attenuating collection in the right pleural cavity with no contrast enhancement, suggesting a massive hematoma collection that has compressed the adjacent lung parenchyma. A cannon-ball-type lung nodule is also visible in the visualized part of the right lung in a paracardiac location. Axial lung window chest CT at different levels (1b and 1c) show bilateral rounded lung nodules.



2a 2b

Figure 2: 2a)The arterial phase of the contrast enhanced axial CT image shows the right upper pole renal mass measuring 7cm craniocaudally. There are hyperenhancing areas suggesting the mass is hypervascular, with a surrounding hyperdense collection from a perinephric hematoma. b) The coronal pre-contrast CT scan shows the hematoma extending to the pelvic retroperitoneal space. The right hemothorax is also partly visible.

Discussion

Spontaneous hemothorax and perinephric hematoma are rarely documented in medical literature, and their occurrence as a result of RCC is notably uncommon. To the best of our knowledge, the simultaneous presentation of spontaneous hemothorax and perinephric hematoma secondary to renal cell carcinoma is extremely rare.

The etiologies of spontaneous hemothorax and perinephric hematoma differ significantly. Spontaneous hemothorax is primarily attributed to spontaneous hemopneumothorax, with other causes including coagulopathy, vascular disorders, and neoplastic causes (3). On the contrary, the leading cause of spontaneous perinephric hematoma, also known as Wunderlich syndrome, is primarily renal tumors (4, 5). Concurrent spontaneous hemothorax and perinephric hematoma have been reported following anticoagulation therapy (1). Metastasis of RCC presenting with hemothorax is exceedingly rare. In contrast, RCC can manifest with pleural effusion in approximately 1-2% of cases, a much more common occurrence than hemothorax. The most frequent pulmonary manifestation of RCC is metastasis to the lung, typically appearing as solitary or multiple lung nodules, as observed in our patient. Furthermore, RCC commonly metastasizes to sites such as bone, lymph nodes, liver, and the brain (2).

The etiology of spontaneous hemothorax and perinephric hematoma in RCC is not known. In a case report by Chetcutti and his colleagues, the mechanism of hemothorax was thought to be secondary to tumor invasion of the intercostal vessels and the vascularity of the tumor (6). Polkey, in his review of nontraumatic perirenal and renal hematomas, proposed that perinephric hematoma in RCC can result from venous congestion of the kidneys, with the resultant elevated vascular pressures and possible capsular rupture (7). Contrast-Enhanced Computed Tomography (CECT) is the most reliable modality in diagnosing retroperitoneal hemorrhage and RCC. (8) However, the accuracy of CT in diagnosing small tumors <2cm in size in the background of perinephric hematoma is poor, as evidenced by research conducted by Kendal et al, which found that 60% of patients with perinephric hematoma in the absence of anticoagulants and trauma had renal tumors that were not diagnosed on CECT or angiography (9) . The clinical presentation in this case was atypical for RCC, prompting consideration of other differential diagnoses during the patient's workup. Given the complaint of vaginal bleeding, choriocarcinoma with metastasis to the lung and right kidney was among the differential diagnoses considered. The patient's

reproductive age group made gestational choriocarcinoma a more plausible consideration(10); however, there was no recent history of abortion, molar, or non-molar pregnancy, and ultrasound and CT scan findings indicated a normal uterus. Another consideration was lung cancer with metastasis to the kidney, although less likely due to the presence of multiple lung nodules of similar size with cannonball appearance. While perinephric hematoma from adrenal metastasis of lung cancer has been reported, the likelihood of renal metastasis with perinephric hematoma is very rare (11). The final diagnosis in this patient was confirmed following histopathology results. The management of both perinephric hematoma and spontaneous hemothorax mostly depends on patient stability. For stable patients with spontaneous hemothorax, thoracoscopic draining is the optimal management option. For patients who are hemodynamically unstable or if the rate of bleeding is more than 500 mL/hr in the first hour with 200-300 mL/hr subsequently, an early surgical approach is preferable (3).

Following initial CT assessment, radical nephrectomy emerges as the preferred treatment for renal tumors identified as malignant, as delaying management could compromise resectability. Certain studies advocate for radical nephrectomy in cases of perinephric hematoma with a normal contralateral kidney, given the heightened likelihood of occult tumors (9). In instances of benign renal masses, embolization may serve as a viable alternative management strategy (12). In conclusion, the co-occurrence of spontaneous hemothorax and perinephric hematoma is observed in patients undergoing anticoagulant therapy. This case serves as an illustration of a rare presentation of RCC associated with spontaneous hemothorax and perinephric hematoma. Therefore, keeping in mind the possibility of potential underlying malignancy in patients exhibiting these clinical manifestations is crucial. Patients can be managed aggressively with a surgical approach or embolization or with delayed management after stabilization depending on their hemodynamic stability.

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