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Oncology

Paraneoplastic renal cell carcinoma in the setting of preeclampsia and placental abruption

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Introduction

Paraneoplastic syndromes are systemic disorders in response to a neoplasm and can have various clinical manifestations depending on the organ system(s) affected. Paraneoplastic renal cell carcinoma (RCC) arises from the release of cytokines and hormones from the tumor and can have a variety of presentations including hypertension, hypercalcemia, anemia, fevers, coagulopathy, transaminitis, and polycythemia.[1] Approximately 10–40% of patients with RCC develop a paraneoplastic syndrome of which hypercalcemia and hypertension are among the two most common presenting signs.[2] Paraneoplastic RCC in the perinatal period, however, is exceedingly rare. Here, we illustrate a novel clinical scenario of paraneoplastic RCC presenting in a previously healthy 20 year old postpartum patient whose pregnancy was complicated by preeclampsia and placental abruption.

Case presentation

This is a 20 year old otherwise healthy primigravida woman who presented at 31-weeks gestation with hypertension and proteinuria suggestive of preeclampsia without severe features. Fetal heart tracing demonstrated persistent late decelerations and the patient was taken for emergent cesarean section. Intraoperative complications included placental abruption and significant blood loss. The patient remained hemodynamically stable throughout the case and was transferred to the recovery room in stable condition.

Postoperatively, the patient's hemoglobin declined to 8.6 mg/dL from a baseline of 9.7 mg/dL. On the second postoperative day, the patient developed fevers and was treated with antibiotics for presumed endometritis. Blood, endometrial and urine cultures, however, were negative for infection. The patient continued to have low-grade fevers and leukocytosis on the following three postoperative days. The patient's anemia progressively worsened to a serum hemoglobin 6.4 mg/dL. However, there were no obvious sources of bleeding as both pelvic and abdominal ultrasound studies were negative for hemorrhage.

On the seventh postoperative day, the patient continued to have postpartum hypertension despite delivery of the fetus, low-grade fevers and leukocytosis despite appropriate antibiotic coverage and anemia despite blood transfusions. Interestingly, the remainder of her vital signs was stable and she appeared nontoxic on clinical exam. An abdominal computed tomography scan with intravenous contrast was ordered to assess for an intra-abdominal fluid collection or an alternate source of infection. A $10.5 \times 10.5 \times 10.5$ cm enhancing, left-sided retroperitoneal mass with multiple areas of hemorrhage in close proximity to the left kidney was visualized (Fig. 1). A renal mass biopsy demonstrated an oncocytic neoplasm with the presence of necrosis and hemorrhage, suspicious for chromophobe RCC. Given a high suspicion for a paraneoplastic RCC in the setting of unexplained source of worsening anemia, hypertension, and hypercalcemia, we pursued a left laparoscopic radical nephrectomy in favor of definitive management. Histopathological examination of the kidney revealed a 10.5 cm predominantly necrotic mass with only a small region of viable oncocytic

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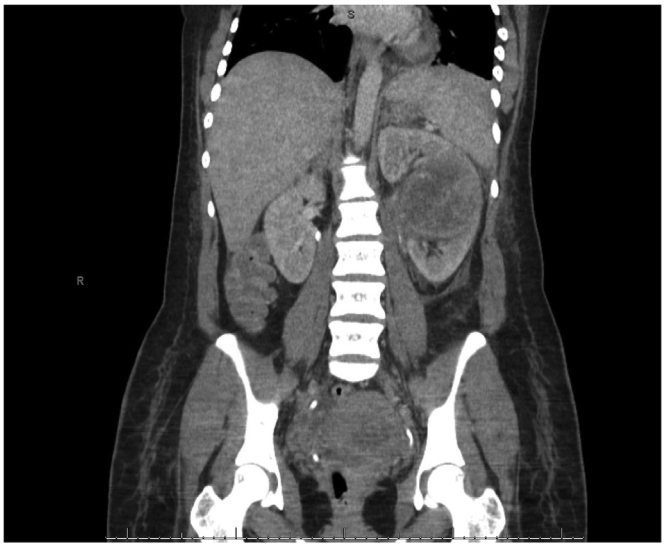

Fig. 1. Computed tomography demonstrating a 10.5 × 10.5 × 10.5 cm left-sided, enhancing retroperitoneal mass with peripheral coursing vessels in contact with the left kidney.

tumor cells remaining, suspicious for chromophobe RCC (Fig. 2). Cellular staining of the tumor was positive for Vimentin and CD1117, consistent with chromophobe RCC (Fig. 3). Postoperatively, the patient's low-grade fevers, persistent hypertension and leukocytosis had all improved. Additionally, the patient's serum hemoglobin and hypercalcemia normalized following surgery.

Discussion

This case report illustrates a novel clinical phenomenon where paraneoplastic RCC was discovered incidentally during sepsis workup in a postpartum patient whose pregnancy was complicated by preeclampsia and placental abruption. RCC is especially uncommon in women less than twenty years of age. Approximately 10% of this patient population will exhibit metabolic or electrolyte abnormalities characteristic of a paraneoplastic syndrome.[2,3] Our patient exhibited several manifestations of RCC paraneoplastic syndrome including both systemic (fevers, leukocytosis, hypertension, anemia) as well as metabolic (hypercalcemia) abnormalities. Furthermore, the development of urologic paraneoplastic syndromes is considerably more common in clear cell and papillary subtypes of RCC and is exceptionally rare with chromophobe subtypes.[4] It is evident that recognizing and diagnosing paraneoplastic RCC in the perinatal setting can be especially challenging given the presence of tremendous physiologic variability.

Little is known regarding the simultaneous occurrence of preeclampsia and paraneoplastic RCC; this coincidence represents an atypical concurrence between two etiologies of hypertension and systemic illness. It is uncertain whether this patient's initial presentation of hypertension and systemic illness at 31-weeks gestation was attributed to preeclampsia or the initial manifestations of paraneoplastic RCC. Palpable mass (88%), pain (50%) and hematuria (47%) are listed amongst the top three most common initial presenting signs/symptoms of RCC in pregnancy, none of which were present in our patient.[5]

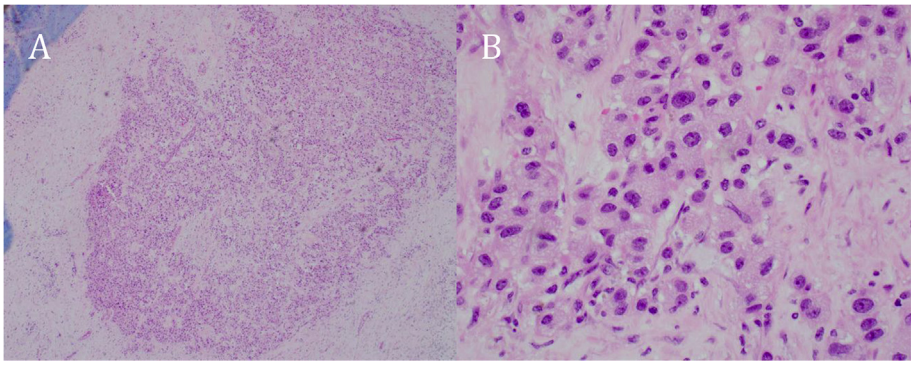

Fig. 2. Histopathological examination of renal mass biopsy demonstrating high-grade appearing invasive oncocytes, consistent with chromophobe RCC (A) H&E stain, 10× (B) H&E stain, 40×.

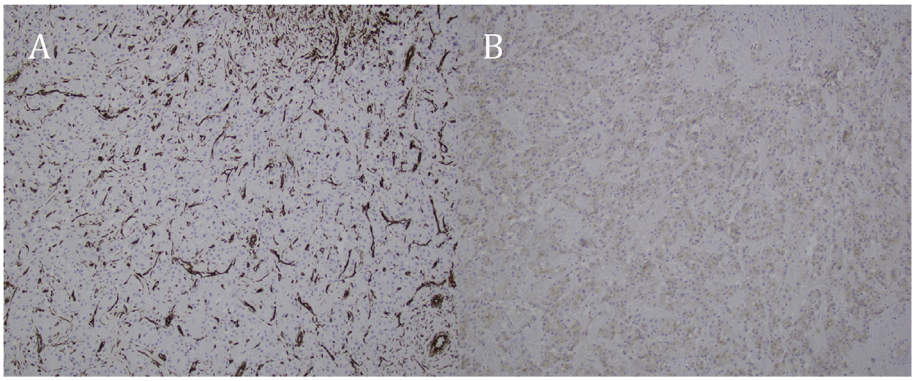

Fig. 3. Histopathological examination of left renal mass surgical specimen with (A) Vimentin stain positivity and (B) CD117 stain positivity consistent with RCC.

Hypertension as a presenting sign accounts for only 18% of cases, to which pregnancy and preeclampsia are most likely attributable. As a result, paraneoplastic RCC is often not considered in the differential diagnosis of patients, which may lead to a delay in diagnosis and treatment. Given this peculiar scenario, we believe that paraneoplastic RCC should be considered in patients with systemic signs in combination with other electrolyte abnormalities (e.g. hypercalcemia) in the perinatal period. Further research elucidating the connection between pregnancy-related complications as a precipitating factor of a paraneoplastic syndrome is warranted. The resolution of these systemic and metabolic abnormalities after radical nephrectomy appears to be both diagnostic and therapeutic, implicating paraneoplastic RCC as the likely culprit.

Conclusion

Paraneoplastic RCC in the perinatal period is exceedingly rare. We believe that persistent systemic and metabolic abnormalities in the presence of a renal mass in a postpartum woman with preeclampsia should raise suspicion for paraneoplastic RCC. Urgent surgical removal may be both diagnostic and therapeutic for this unique urologic malignancy.

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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