

Simultaneous Cesarean Section and Radical Nephrectomy With Tumor Thrombectomy During Pregnancy

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Abstract- Renal cell carcinoma (RCC) is uncommon during pregnancy. Accurate and timely diagnosis and careful preoperative planning are essential to optimize the patient outcomes. A 27-year-old pregnant woman presented with a large mass in left kidney and inferior vena cava (IVC) tumor thrombus, diagnosed at 33 weeks gestation. She was evaluated with an initial impression of pyelonephritis at other institutions and referred to our center after a delay of more than 3 weeks. RCC with IVC tumor thrombus has the potential to increase the likelihood of thromboembolic events including pulmonary embolism during pregnancy. Furthermore, simultaneous radical nephrectomy with IVC thrombectomy and Cesarean section (CS) is challenging and might be associated with significant intraoperative blood loss. After consultation with an obstetrician and cardiac surgery team, our patient underwent CS and simultaneous left radical nephrectomy with IVC thrombectomy at 34 weeks gestation. The postoperative course was uneventful and histologic analysis revealed pT3bN0M0 papillary RCC.

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Introduction

Renal cell carcinoma (RCC) is a rare condition among pregnant women. The role of high parity and hormone-related or reproductive factors in kidney cancer etiology is controversial and conflicting data are available in the literature (1).

Pregnancy per se is a hypercoagulable state (2), and simultaneous malignant disorder may further increase the risk of thromboembolism events. Therefore, the occurrence of cancer during pregnancy poses a significant risk and is a great dilemma for physicians. It is also associated with significant physical and psychologic distress for the patient and her relatives.

In this report, we describe a case of RCC with inferior vena cava (IVC) tumor thrombus extended to the intrahepatic portion of IVC, diagnosed during the 3rd trimester of gestation, and discuss the management of such challenging patients.

To our knowledge, only two cases of RCC with IVC tumor thrombus during pregnancy has been reported (3,4) and our report is the first case of papillary RCC with IVC tumor thrombus who was managed with simultaneous

Cesarean section (CS) and radical nephrectomy with IVC thrombectomy in the 3rd trimester of pregnancy.

Case Report

A 27-year-old primigravida woman with gross hematuria was referred to our hospital at 33 weeks of gestation. Despite evidence of renal tumor in ultrasonography, she received antibiotic therapy with the impression of pyelonephritis. Initial mismanagement at another institution resulted in delayed diagnosis for more than 3 weeks.

At presentation, she had mild left flank pain, and physical examination revealed no abnormality. Urinalysis showed hematuria, and serum creatinine and hemoglobin were 0.8 mg/dL and 12 g/dL, respectively. Abdominal ultrasonography revealed an 87×100 mm solid mass in the lower pole of the left kidney. Additional imaging for more accurate staging with MRI was performed and confirmed a large mass with dimension 97×91 mm in the mid and lower pole of the left kidney with tumor thrombus extending into the intrahepatic portion of IVC (Figure 1).

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Figure 1. Left kidney tumor with tumor thrombus extending to inferior vena cava (arrow). Tumor thrombus is evident as a hypointense lesion in MR images

After consultation with an obstetrician and cardiac surgeon, the patient underwent CS through a lower midline incision and delivered a 2700 g live male child. After delivery, the midline incision was extended to xiphoid to provide exposure for radical nephrectomy and IVC tumor thrombectomy. The liver was mobilized by ligating and dividing the teres, falciform, and left triangular ligaments. Accessory hepatic veins were ligated, and the plane between the IVC and liver was developed. Additionally, lumbar veins were ligated, and IVC mobilization was completed. Since tumor thrombus did not extend cephalad to hepatic veins, IVC was clamped below these veins, and cavotomy was then performed. Operative time was 250 min with an estimated blood loss of 450 mL. The postoperative course was uneventful, and the patient discharged on the fifth postoperative day. Histological analysis revealed pT3bN0M0 papillary RCC with Fuhrman nuclear grade 3. Three months after surgery the patient presented with a serum creatinine of 1.3 mg/dL and no evidence of local recurrence and pulmonary metastasis in the chest and abdominopelvic computed tomography scan.

Discussion

RCC accounts for 2 to 3% of all adult malignant tumors with a slight male to female predominance, and it is unusual in patients under 40 years of age (1,5). Although RCC is very rare during pregnancy, it is the most common renal neoplasm occurring among pregnant women (6). In 2015 Khaled *et al.*, reviewed the literature and reported 106 cases of RCC during pregnancy. The

most common presenting symptoms were the flank pain (50%), hematuria (47%) and hypertension (18%); however, because of increasing utilization of ultrasonography for antepartum care, currently, RCC in pregnant women are diagnosed more incidentally (1).

Clinical presentation of RCC may resemble symptoms and complaints associated with physiologic and anatomic changes during pregnancy, leading to difficulty in making an accurate diagnosis (7). Physical exam during pregnancy might also be misleading. For instance, the gravid uterus may sometimes obscure the flank mass, especially during the second and 3rd trimester (6). Therefore a high level of suspicion is needed to prevent delay in diagnosis.

The obvious challenges in the management of RCC with IVC tumor thrombus during pregnancy are the risk of migration of thrombus and pulmonary embolism as well as the risk of intraoperative hemorrhage especially when radical nephrectomy with IVC thrombectomy and CS are supposed to be performed concurrently. Therefore, careful preoperative planning and presence of a multidisciplinary team including urologist, gynecologist, anesthesiologist, and cardiac surgeon for decision making are of utmost importance (8).

Kidney should be mobilized meticulously with minimal manipulation. IVC is also clamped cephalad to the level of the thrombus to prevent sudden migration of tumor thrombus and pulmonary embolism. Patients with free-floating IVC thrombus are at elevated risk of pulmonary embolism.

Using Transesophageal echocardiography (TEE) is essential for the evaluation of cranial extension and monitoring potential migration of thrombus (8). In the present case, TEE was performed by the anesthesiology team, and thrombus position was determined.

One of the most important considerations in treating the pregnant woman with RCC is the timing of treatment. Recommendations regarding the timing of surgery depend on the gestational age, the size of the mass and probability of survival of fetus (7). If the solid mass is discovered in the 3rd trimester, delivery followed by resection of the tumor is recommended (6). However, some investigators suggest immediate nephrectomy regardless of pregnancy stage as the tumor behavior is not predictable in all patients and there is potential for progression into the advanced stage as well as metastatic involvement (9-11).

To the best of our knowledge, this is the first report of simultaneous radical nephrectomy with IVC thrombectomy and CS in a pregnant woman. The Maternal and neonatal outcome is highly dependent on

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the quality of care including timely diagnosis, proper radiologic staging, multidisciplinary decision making, and careful surgical considerations. Cancer during pregnancy has the potential to be overlooked; therefore, physicians should be aware of the possible risk and assess the patients thoroughly to prevent delayed diagnosis.

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