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Renomedullary Interstitial Cell Tumor in Pregnancy: A Review Article with a Case Presentation

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Abstract

Introduction: Renomedullary interstitial cell tumor (RICT), or medullary fibroma, is a small tumor that is usually asymptomatic unless it attains a significant size; in rare cases, the tumor may be large and symptomatic. These benign tumors have a specific histology. Although they are usually incidental findings, it is necessary to be able to discriminate this lesion from other malignancies of the kidney, especially since its management represents a challenge during pregnancy. Numerous patients undergo an unnecessary radical nephrectomy to diagnose renal masses, which is considered hazardous for pregnant women. Ultrasound is the imaging procedure of choice followed by the magnetic resonance imaging (MRI) for assessing the urinary system in pregnant women. Histopathological examination is considered mandatory for the diagnosis of RICT to preclude an unnecessary nephrectomy.
Case Presentation: In November 2015, a 31-year-old pregnant woman at gestational week 12 of her second pregnancy was referred to our private clinic in Rasht, Iran. She had microscopic hematuria; a mass measuring 39 × 33 mm in the upper portion of her right kidney was was detected by ultrasonography.
Conclusions: A percutaneous renal mass biopsy was used, instead of nephrectomy, to diagnose the mass; immunohistochemical reports showed that the morphologic features were not compatible with an epithelial neoplasm and the paucicellular spindle cell tumor was compatible with renomedullary interstitial cell tumor. Patients with RICT can be successfully managed using a percutaneous renal mass biopsy and avoiding unnecessary nephrectomy.

Keywords: Renomedullary, Tumor, Pregnancy, Histopathology

1. Introduction

Pregnancy-associated tumors, although rare, have increased statistically. The incidence is one for every 1,000 maternities (1). It is estimated that less than 0.1% of pregnancies are complicated by any form of neoplasm and only 0.0013% are complicated by urinary cancer (2). With the prevalent use of imaging for nonspecific musculoskeletal or abdominal complaints, there has been an increase in the incidental diagnosis of renal masses less than 4 cm; approximately 20% of these renal masses are benign (3). As the incidence of clinically detected renal masses increases, there is a corresponding increase in surgical therapy, which is considered an aggressive approach for the treatment of renal masses (4). A percutaneous renal mass biopsy can be used to detect which masses are benign and which are aggressive to permit better stratification of patient treatment decisions (5). Recent reports have revealed that there is a low risk of significant complications after a percutaneous renal mass biopsy (< 5% incidence) (6), and although bleeding is prevalent (> 90%) (7), it is infrequently clinically significant (6). The combination of an increase in perceived benefits and the low risk associated with percutaneous renal mass biopsies means that the percutaneous renal mass biopsy is considered to be a fundamental element in the diagnostic evaluation of many small solid renal masses (8).

Since image-guided percutaneous renal mass biopsy is considered a highly accurate procedure with minimal morbidity, it can be used to detect benign disease, thus decreasing the number of needless extirpative therapies. Image-guided biopsy will probably continue to assist the management of incidentally detected renal masses, especially for patients undergoing invasive therapy. In this study, we report a case of a renomedullary interstitial cell tumor (RICT), which was incidentally detected in a young pregnant woman RICTs are very common benign tumors that arise from the interstitial cells of the renal medulla. They are usually incidental findings as small tumors (5).

2. Case Presentation

In November 2015, a 31-year-old pregnant woman at gestational week 12 of her second pregnancy was referred to our private clinic in Rasht, Iran. Her gynecologist re-

ferred her to a urologist because of microscopic hematuria and an ultrasonic mass measuring 39 × 33 mm in the upper portion of her right kidney. The patient was accidentally found to have microscopic hematuria (RBC = 25 - 30).There was no past history of chronic hypertension, urinary tract infection, or any renal diseases, and the patient had no other symptoms, such as pain or a palpable mass. The patient had no infectious diseases, hypertension, cardiovascular disease, maternal bleeding, high blood pressure associated with pregnancy, infection, pelvic girdle pain, anemia, or incontinence; her general condition was good with no history of earlier urologic problems. Ultrasound was used to diagnose an isoechoic to mildly echogenic well-marginated mass measuring 39 × 33 mm in the upper portion of the right kidney (Figure 1). While computed tomography (CT) scan is the typical imaging modality used to diagnose renal masses (9), due to the risk of exposing the fetus to radiation and not knowing the precise radiation dose to the fetus, we did not consider using the CT scan, which made the full evaluation of the tumor problematic. Magnetic resonance imaging (MRI) demonstrated a heterogeneous signal intensity in the upper pole of the right kidney (Figure 1). The mass seemed to be encapsulated and produced renal capsule bulging. Rather than using nephrectomy, an ultrasound-guided percutaneous renal mass biopsy was performed to diagnose the tissue. Immunohistochemical reports showed a paucicellular tumor composed of spindle and pulmp cells set in a loose highly vascular background that the morphologic features were not compatible with an epithelial neoplasm; in conjunction with the immunostain pattern, the features were suggestive of a RICT (Figure 2).

3. Discussion

RICTs, previously called medullary fibromas, are very common benign tumors that arise from the interstitial cells of the renal medulla. They are usually incidental findings. A RICT usually localizes in the renal medulla and frequently measures less than 0.5 cm in diameter, although there have been some tumors that have been larger than 8 cm. The tumor is usually solitary, but sometimes there may be multiple tumors or the tumor may be bilateral. Few RICTs are large enough to cause symptoms and become clinically evident (10, 11). Immergut and Cottler stated that hematuria is a symptom due to the torsion of the tumor's pedicle (10).

The patient presented with microscopic hematuria at gestational week 12, which was an accidental finding. It should be mentioned that hematuria is expected during pregnancy as the flow of renal blood increases (12). To determine the cause of the hematuria, the patient was assessed. The preferred diagnostic modality is the ultrasound since there is no risk of radiation to the developing fetus (9). Ultrasound findings showed an isoechoic to mildly echogenic well-marginated mass measuring 39 × 33 mm in the upper portion of the right kidney; the mass caused a bulge on the renal capsule of the upper pole of the right kidney. There was also a small cortical cyst with high echogenic content measuring 4 mm in the mid portion of the left kidney. The downside of ultrasound modality is that it is operator-dependent; therefore, full classification and the diagnosis of the renal mass would be suboptimal (9). Radiological contrast agents should be avoided because of teratogenicity effects and transplacental risk for the fetus (13). For a more meticulous evaluation of the mass, MRI was used. MRI evaluation is beneficial as it is reproducible and is an alternative to CT scans for the evaluation of renal masses in pregnant patients (14). The findings showed a well-defined mass (39 × 43 × 38 mm) with a heterogeneous signal intensity in the upper pole of the right kidney. It seemed to be encapsulated and had caused the bulging of the renal capsule; cystic degeneration was noted within the lesion. There was no evidence of tumoral invasion to adjacent structures or into the renal vein. Since both ultrasounds and MRI do not use ionizing radiation, they are considered safe in gestation (15). The preoperative diagnosis of RICT is challenging since the radiological calcifications all mimic either renal cell carcinoma or transitional cell carcinoma (16). To identify benign or aggressive masses, and to avoid unnecessary surgical or ablative therapies, a percutaneous renal mass biopsy was performed. Percutaneous renal mass biopsy has been proved to be advantageous and safe, with diagnostic rates above 90% (17, 18). The technical success rates with respect to procuring sufficient tissue for histologic analysis have been reported to range from 78% to 100% (19). Attention to the success rates of percutaneous biopsy for small (< 4 cm) solid masses in kidney. The likelihood of a malignancy within a small solid renal mass is inversely related to the size of renal tumor; up to 22% of masses measuring between 1 and 4 cm are benign. In addition, malignancies found in these smaller masses are likely to be lower grade than those detected in larger masses (20). Recent studies have shown there is a low risk of major complications following the procedure (< 5%) (17), although bleeding is common (> 90%) (21).

Current literature has paid particular, it is scarcely clinically significant (17). An increase in perceived advantages and the reasonably low risk associated with the procedure has caused percutaneous renal mass biopsies to be considered an integral part in the diagnostic assessment of many small solid renal masses (8). Percutaneous renal mass biopsies are usually done by either ultrasound guidance or CT;

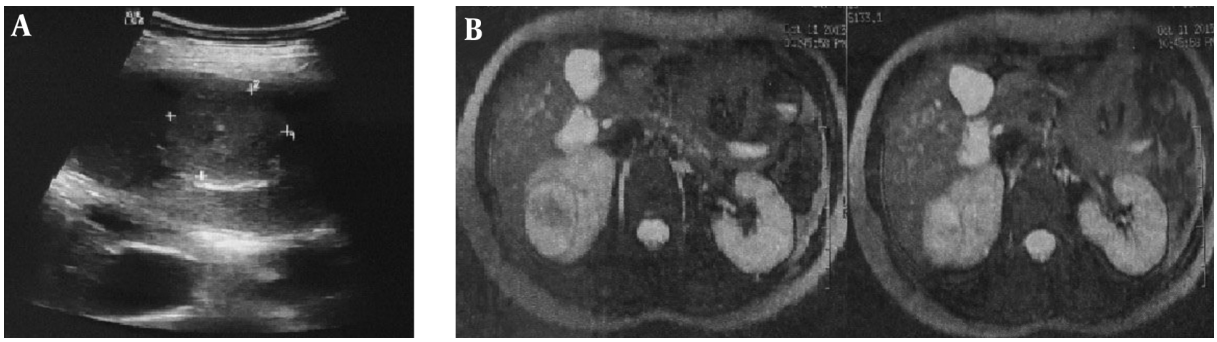

Figure 1. A, Ultrasound showing an isoechoic to mildly echogenic well-marginated mass measuring 39 × 33 mm in the upper portion of the right kidney; B, Magnetic resonance (MR) image of a mass in the upper pole of the right kidney demonstrating heterogeneous signal intensity in the upper pole of right kidney.

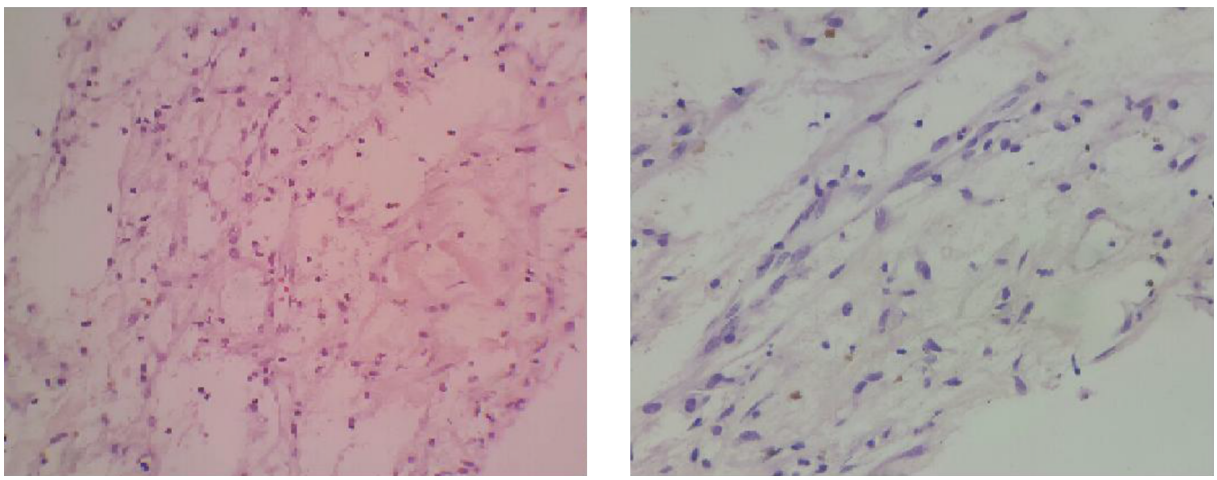

Figure 2. Immunohistochemical reports showing a paucicellular tumor composed of spindle and pulmp cells set in a loose highly vascular background pattern and features which are suggestive of RMICT (magnification ×100).

for the patient, ultrasound guidance was used. Although lesions might not be well visualized on ultrasound, usually because of large body habitus or overlying bowel gas, ultrasound guidance was the preferred modality to avoid ionizing radiation and multiplanar real-time imaging. In a study done by Halverson et al. (21), 151 patients with small renal masses underwent both a percutaneous renal mass biopsy and a subsequent partial or radical nephrectomy. Histology rendered from the core biopsy and rendered from surgery were in total concordance (21). Percutaneous renal mass biopsy using ultrasound guidance was performed safely and effectively. Tissue samples were obtained using a fine-needle aspiration technique, and the samples were sent to the pathology laboratory in formalin for analysis. The surgical pathology report showed a paucicellular tumor composed of spindle and plump cells in a loose, highly vascular background; the morphologic features in conjunction with the immunostain pattern were suggestive of RICT since the morphologic features were not compatible with an epithelial neoplasm. Although RICT is a benign finding, follow-up was compulsory for the patient.

3.1. Comment

Although kidney cancer during pregnancy is sporadic, it is crucial to be aware of incidental renal masses. Management of renal masses is critical because many patients undergo unnecessary radical nephrectomy, which is considered very hazardous during pregnancy. We believe that ultrasound evaluation for pregnant patients should be applied because this evaluation is manageable for the patient and safe for the fetus. In the case where small tumors are detected in pregnant mothers, applying a percutaneous renal mass biopsy is recommended because it is

accurate and safe. In a differential diagnosis, RICT, which can be mistaken for malignant renal tumors, should be taken into consideration. Considering only a diagnosis of malignant renal tumors can lead to various unnecessary nephrectomies. A preoperative diagnosis is viable with new endourological techniques. Although RICT is considered benign, follow-up is compulsory.

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Footnote

Authors' Contribution: Study concept and design, Siavash Falahatkar; analysis and interpretation of data, Nadia Rastjou Herfeh (corresponding author); drafting of the manuscript, Nadia Rastjou Herfeh; revision of the manuscript for important intellectual content, Sahand Omidi, Siavash Falahatkar; statistical analysis: Samaneh Esmaeili.

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