

Needle Tract Recurrence of Renal Cell Carcinoma after Microwave Ablation

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Introduction

Thermal ablation is commonly used for management of small renal masses. Tumor seeding due to needle manipulation during renal mass biopsy or thermal ablative treatment is very rare. Seeding upstages a curable, organ-confined disease into a complicated recurrent cancer. This condition is described in few case reports and has not been reported after microwave ablation [3]. We report a patient that underwent transhepatic microwave ablation of a right renal cancer and developed a tumor along the ablation tract.

Case report

A 75-year-old male with complex medical history including heart disease, hypertension, chronic kidney disease, and sleep apnea presented to our clinic with a 4 cm right renal mass discovered incidentally following CT imaging for unrelated abdominal pain (**Figure 1**). A biopsy of the mass revealed a Fuhrman grade 2 clear cell renal cell carcinoma (RCC). Treatment options were discussed and the patient elected microwave ablation therapy. This procedure was performed by a urology and radiology collaborative team.



Figure 1: Preoperative CT showing right upper pole kidney tumor (thin arrow) and adjacent cyst (thick arrow).

Three PR -15 (NeuWave Medical, Madison, WI) microwave probes were inserted transhepatically into the upper pole renal tumor. Correct positioning of the probes within the mass was confirmed with ultrasound and abdominal CT scan (**Figure 2**). Immediate post procedure films showed complete ablation of the tumor and the adjacent cyst. Significantly, the entire trans-hepatic tract was ablated during removal of the microwave probes, as is our protocol.

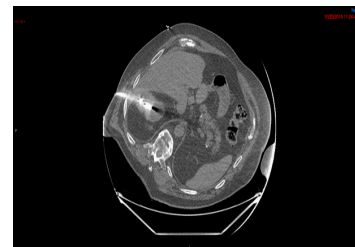


Figure 2: Transhepatically placed microwave probes traversing the posterior aspect of the liver (arrow) with tips located in the right renal mass.

Six months later, the patient underwent a surveillance CT scan which demonstrated no tumor recurrence (**Figure 3**). MRI imaging at year 2 demonstrated stable post-treatment changes of right upper pole kidney ablation, without evidence of tumor recurrence or metastasis.

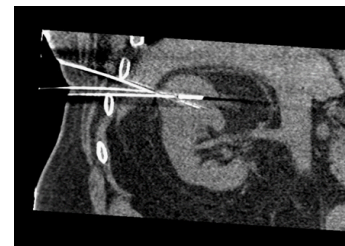


Figure 3: Coronal oblique CT reconstruction showing path of probes through liver edge.



Figure 4: CUS during ablation showing probe tract through liver edge.

Five years following ablation, the patient presented with gross hematuria and right flank pain. A CT urogram demonstrated a filling defect in the proximal right ureter. Additionally, there was an ill-defined hypo-enhancing lesion at the posterior right hepatic lobe with an adjacent small perihepatic soft tissue

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nodule, not present on prior studies (**Figure 4**). The patient underwent right ureteroscopy. Upon entry into the bladder, blood was effluxing from the right ureteral orifice. Ureteroscopy revealed old clot in renal pelvis, but no tumors or active bleeding. Urine cytology was negative for malignancy.



Figure 5: Six month post ablation CT showing non-enhancing right upper pole mass. Liver appears normal.



Figure 6: Five year post ablation image showing liver mass (hollow arrow), perihepatic mass (thin arrow), and enhancing upper pole renal mass (arrow-head).

The patient was referred for ultrasound guided percutaneous biopsy of the liver mass. The biopsy revealed metastatic carcinoma, favored to be renal cell carcinoma. Metastatic workup with a chest CT demonstrated scattered (approximately 15) sub-centimeter pulmonary nodules suspicious for metastatic disease. A review of the CT showed 2 cm recurrence of the right upper pole renal mass. The patient has been evaluated by medical oncology and is currently on an active surveillance protocol for his asymptomatic metastatic disease.

Discussion

Percutaneous thermal ablation has been described to be effective in the management of appropriately selected cases of RCC. Few reports of metastasis in the ablation tract after treatment have been published [1, 2]. Metastasis following ablation is suspected to be caused by tumor spillage during cryoablation or during withdrawal of the probe at the end of ablation [3]. Accumulated anecdotal cases note that transhepatic access to the upper pole of the kidney can be performed safely in the rare cases where no other access is possible [4, 5].

Some reports suggest transhepatic radiofrequency ablation can be an advantageous approach for superior or anterior renal masses, especially in patients that are unable to undergo ablation in the prone position [4, 5]. The main disadvantage identified is the violation of the peritoneum, which portends increased risk of seeding. It is estimated that such seeding is a very rare, occurring in <0.01% of cases. These reports discuss tract ablation to mitigate this risk; however, the benefit of this approach is not well defined. To our knowledge, metastasis to the liver following a transhepatic approach has not been previously described after percutaneous microwave ablation of RCC. In the case of our patient, this was an anterior, superior mass. However, this recurrence occurred despite our careful ablation of the liver tract at the end of the procedure.

Conclusion

Seeding metastasis is an unfortunate and rare event, which can occur after percutaneous ablation of a renal mass. We caution all clinicians to avoid transhepatic access for percutaneous ablation of a renal mass, when feasible, to avoid possible hepatic seeding metastasis.

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