



Possible Drop Metastasis After Treatment of Renal Cell Carcinoma With Percutaneous Cryoablation

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CASE REPORT

A 69-year-old male with no documented past medical history presented to an outside institution with a 2.9 cm left lower pole renal mass that was incidentally discovered on imaging performed for abdominal and back pain. He denied any history of hematuria or flank pain. He was referred to the interventional radiology service for CT-guided percutaneous biopsy and cryoablation of the left renal mass. Three core needle biopsies were performed using a 20 gauge cutting needle with coaxial technique. Hydrodissection was used to displace the colon in preparation for cryoablation due to the lesion's anterior location. Three cryoprobes were used to ablate the tumor and 2 cycles of freezing followed by active thawing were performed. Good coverage of the tumor was seen and there were no complications noted. The biopsy results showed renal cell carcinoma (RCC). No nuclear grade was assigned.

Surveillance computed tomography (CT) scans at 3- and 9-months postablation showed ablation defect with no enhancement. Roughly 1 year later, the patient underwent a surveillance CT scan which demonstrated 2 enhancing lesions: a 2.7 cm lesion at the prior ablation site and a 3.8 cm lesion in the rectovesical pouch in close proximity to the right ureter, right seminal vesicle, and rectum. The patient was referred to the interventional radiology service for percutaneous biopsy of both lesions. This was performed and the pathology results of both lesions showed Fuhrman grade 4 clear cell RCC. The patient was then referred to City of Hope. A re-review of this latest biopsy was performed, with no change in diagnosis.

The patient was seen in consultation and a staging CT scan of the chest, abdomen, and pelvis was performed. There was interval growth of the left renal tumor to 4.7 cm and the right pelvic tumor to 6.4 cm. Unfortunately, 3 new pulmonary metastases were also seen

(Fig. 1). There was no suspicious lymphadenopathy. The patient's physical examination was within normal limits and his Karnofsky performance status was 100%. The patient seemed to have undiagnosed renal insufficiency; his serum creatinine level was 1.36 mg/dL (estimated GFR 55 mL/min/m²). The remainder of his serum laboratory values, including hemoglobin, calcium, lactate dehydrogenase, alkaline phosphatase, and liver function tests were all within reference ranges. After discussion of treatment options, the patient was recommended to undergo left robot-assisted salvage cytoreductive radical nephrectomy, resection of pelvic mass, and cystoscopy with right ureteral stent placement to be followed by systemic therapy.

During surgery, the mass was apparent in the left lower pole of the kidney and there were surrounding adhesions, which were sharply taken down. The mesentery in this area was found to be adhered to the mass. We resected widely around the adherent mesentery, leaving it attached to the mass in hopes of obtaining a negative margin. The remainder of the radical nephrectomy was completed. Retroperitoneal lymphadenectomy was omitted due to the normal appearance of the lymph nodes on preoperative imaging and intraoperative inspection. Cystoscopy and right ureteral stent placement was performed to aid in identification and preservation of the ureter during resection of the pelvic metastasis. The patient was repositioned in lithotomy position and the robot was redocked with the ports placed in the standard radical prostatectomy configuration. The pelvic mass was seen in the rectovesical pouch (Fig. 2). It was found to be adherent to the right seminal vesicle, but was able to be dissected away from the nearby rectum and right ureter. The mass and right seminal vesicle were resected en bloc. The patient's hospital course was remarkable only for urinary retention requiring catheterization. He was discharged home on postoperative day 2 and underwent successful voiding trial 5 days later. Final pathology results demonstrated pT4Nx Fuhrman grade 4 clear cell RCC with sarcomatoid features. A focal positive margin was present at the mesentery. The pelvic mass was positive also for clear cell RCC and margins were negative.

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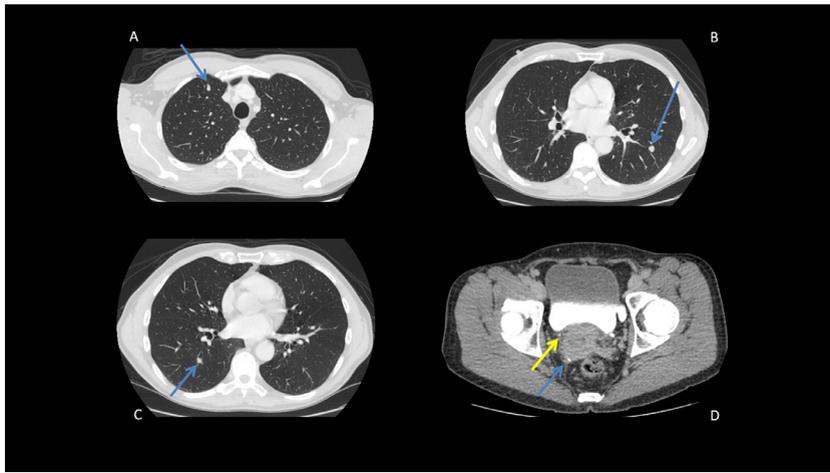


Figure 1. Blue arrows point to metastatic lesions. Yellow arrow points to right ureter. (Color version available online.)

The patient recovered without any complications but was unfortunately found to have developed an additional metastasis in his liver after surgery. He was seen by the medical oncologist and enrolled in a clinical trial. He began treatment with atezolizumab and cabozantinib. Apart from fatigue and nausea requiring a reduction in the dose of cabozantinib, the patient has tolerated his systemic therapy well. The lung and liver metastases demonstrated a strong response to therapy. At his last follow-up, now 10 months after surgery, he is doing well with no radiographic evidence of disease. His serum creatinine level has stabilized at 1.54 mg/dL (estimated GFR 45 mL/min/m²).

DISCUSSION BY CLAYTON S. LAU, MD

Multiple meta-analyses have reported percutaneous cryoablation to be efficacious for the treatment of appropriately selected cases of RCC, though several caveats must be considered.¹⁻³ These meta-analyses contain mostly

retrospective studies and within these studies there is variation in the definition of treatment success. Relative to the low metastatic potential of most small RCCs, follow-up duration is short in many of these studies. In addition, some studies are comprised solely of patients with biopsy-proven RCC while others contain patients with small renal masses that have not been biopsied. Thus, definitive evidence of the long-term oncologic efficacy of percutaneous cryoablation awaits confirmation by prospective randomized studies with adequate follow-up durations.

Rare reports of metastasis in the percutaneous access tract after cryoablation^{4,5} have been published. In RCC, metastasis to the peritoneal lining is generally thought to occur by violation of the tumor capsule with direct extension to adjacent peritoneum or by hematogenous spread.⁶ The case presented here represents a distinct entity, a possible “drop metastasis” to the peritoneal lining of the rectovesical pouch caused by tumor spillage during cryoablation or during withdrawal of the probe at the end of ablation. To our knowledge, metastasis to this location has not been previously described after percutaneous cryoablation of RCC, though it has been described after a case of percutaneous radiofrequency ablation of pararenal metastatic RCC lesions.⁷ In addition, there has been at least one report of metastatic disease within the retroperitoneum after retroperitoneoscopic cryoablation, thought to be caused by inevitable trauma to the tumor during biopsy and cryoablation with subsequent dispersal of tumor cells by CO₂ gas within the retroperitoneum.⁸

We acknowledge that the unusual pelvic metastasis may not be a true drop metastasis, but may instead be better explained by the patient’s tumor biology, which was unusually aggressive given the small size of the tumor. This patient’s case simultaneously underscores the importance of biopsy for the management of small renal masses while highlighting one of its limitations. Biopsies provide clinicians with an accurate assessment regarding the presence of malignancy and tumor subtype, but information regarding the tumor grade is less reliable or sometimes absent. A recent meta-analysis showed that core biopsy of



Figure 2. Metastatic lesion identified in pelvis. (Color version available online.)

small renal masses had >99% sensitivity and specificity for determining the presence of malignancy and 96% concordance with regards to the RCC subtype when compared to surgical pathology. However, concordance for tumor grade was lower (66.7%) and limited by intratumoral grade heterogeneity.⁹ These factors must be taken into account when deciding on management and surveillance of small renal masses.

Prior investigators have reported on the feasibility of salvage partial and radical nephrectomy for local recurrence after thermal ablation of RCC.¹⁰ Though the recent CARMENA trial demonstrated noninferiority of sunitinib alone compared to sunitinib with cytoreductive nephrectomy, these results occurred in a patient population containing a high percentage of poor risk patients.¹¹ In contrast, the patient presented in this case report was considered favorable risk by Memorial Sloan-Kettering prognostic criteria and therefore was judged a good candidate for nephrectomy.¹² Whether nephrectomy should occur before or after systemic therapy has been the subject of recent debate.^{13,14} Given the patient's excellent performance status and the concern for impending ureteral obstruction, upfront nephrectomy with resection of the pelvic metastasis was deemed most appropriate for this patient. This case thus demonstrates that salvage cytoreductive radical nephrectomy can be utilized in cases of recurrent and metastatic RCC with good outcomes in appropriately selected patients. Previous studies have suggested a survival benefit for metastasectomy in appropriately selected patients, with metachronous disease felt to be a good prognostic factor.^{15,16} It may also be utilized in cases in which continued growth of a metastatic lesion may cause local symptoms, such as hematuria due to invasion of the collecting system or obstructive uropathy, as was the case for this patient.

CONCLUSION

Drop metastasis is a rare entity that may occur after percutaneous cryoablation of RCC. With appropriate patient selection, salvage cytoreductive radical nephrectomy can be utilized in cases of recurrent and metastatic RCC with good outcomes. Metastasectomy may be associated with long-term survival and can palliate or prevent local symptoms.

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