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Ablation of a Large Leiomyosarcoma Metastasis in the Liver: Providing Meaningful Impact to Augment Conventional Therapies

Iftikhar Burney, MD and Steven Yevich, MD, MPH

Abstract

A 48-year-old woman presented for treatment of a large 5-cm x 4-cm leiomyosarcoma metastases in the liver. This mass was rapidly progressing on chemotherapy, while the small extrahepatic metastases were overall stable in size and number. Her treatment and a review of the literature supporting ablation as a minimally invasive, targeted treatment option are outlined herein.

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Key words: metastatic disease, microwave ablation, thermal ablation

Soft-tissue sarcomas represent a heterogeneous group of rare cancers with over 70 subtypes.[1] Leiomyosarcoma represents one of the more common histologic subtypes, with an incidence of 1 per 100,000.[1,2] Nearly 40% of patients with this subtype will experience metastases, with the liver being the second-most common site of metastasis after the lung.[3,4]

Treatment for leiomyosarcoma with diffuse nonoligometastatic disease is best managed within a multidisciplinary setting, as these tumors are rare, presentation is varied, and tolerance to chemotherapy can be unfavorable. Systemic treatment with chemotherapy or immunotherapy is the initial treatment of choice.[1] Recently, there has been renewed interest in targeted localized treatment with surgical resection, radiation therapy, or percutaneous ablation.[1,3-5] The goal of targeted focal therapy is to provide local disease control so as to prolong overall survival or at least delay the time to untreatable progression.[1,4] Scenarios in which thermal ablation of liver metastasis are clinically indicated include new metastatic recurrence after completion of chemotherapy, residual disease with incomplete response to chemotherapy, and metastasis that continued to grow despite active chemotherapy regimens in asymmetric proportions to other metastases.[4]

Case Description

A 48-year-old patient was diagnosed with leiomyosarcoma arising from the left gonadal vein. Initial treatment was surgical resection and chemotherapy. Approximately 12 months later, she was found to have nonoligometastatic metastases involving the retroperitoneal, lungs, and liver. The metastases were treated with a combination of chemotherapy and immunotherapy. Despite overall stability in the other metastases, a single liver metastasis rapidly progressed to measure 5 x 4 cm (**Figure 1**). Given the marked asymmetric growth in this liver mass, the patient was referred to Interventional Radiology with the presumption that altered biochemistry of this mass rendered the systemic therapy less effective for this metastasis in relation to the others. The aim was for targeted thermal ablation to focus only on the rapidly enlarging metastasis.

Liver microwave ablation of the segment IV mass was performed under general anesthesia for patient comfort, which is standard practice at our cancer referral center. Given the proximity of the gastric antrum, a protective barrier between

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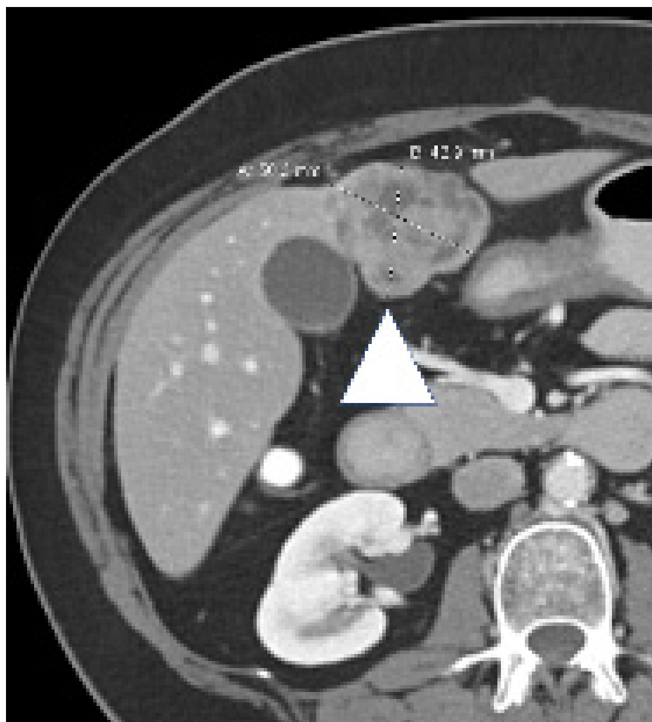

FIGURE 1. Preprocedure computed tomography with contrast in venous phase demonstrates the large, heterogeneously enhancing liver metastasis in segment IV near the gastric antrum and gallbladder lumen.

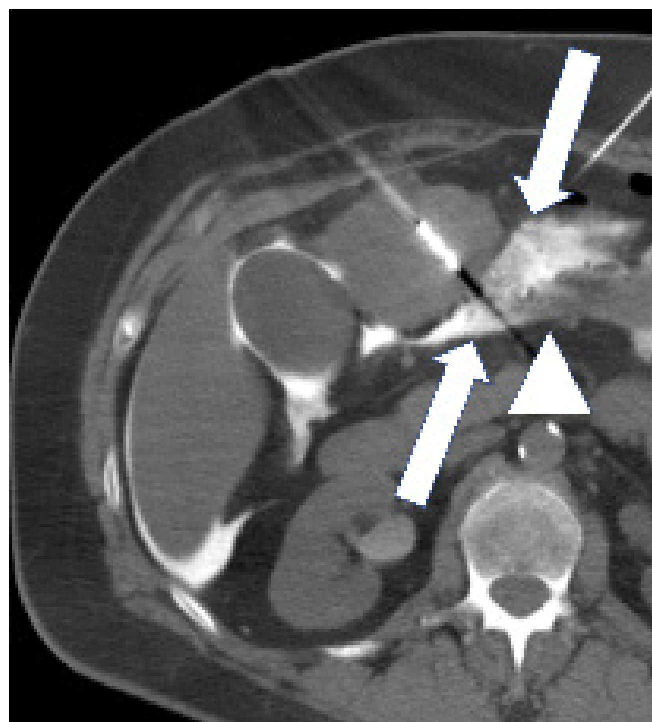

FIGURE 2. Intraprocedural noncontrast computed tomography image demonstrates 1 microwave probe within the lesion, with the tip pointed toward the gastric antrum. A protective buffer (arrows) was created with injection of a 20:1 mixture of dextrose (D5W) and nonionic contrast (radiopaque material) between the mass and the gastric antrum (arrowhead).

the mass and the bowel was created by focal injection of dextrose (D5W) with nonionic contrast (20:1) (**Figure 2**). The gallbladder was already mildly distended at the procedure start, which was thought to provide some measure of natural protective thermal sink for the gallbladder wall. Multiple overlapping ablations (30 W for 3-5 minutes each) were performed using two 15-g microwave ablation probes to provide ablation coverage of the entire mass and approximately 5-mm margins (**Figure 3**). A final intraprocedural computed tomography (CT) imaging in the arterial and venous phase was performed to confirm satisfactory ablation margins and ensure that no immediate complications were present (**Figure 4**). As a final pain palliative measure, the distended gallbladder contents were aspirated after insertion of a needle under ultrasound guidance with a transhepatic percutaneous approach.

The patient was extubated and remained overnight for pain control and monitoring. She was discharged the following day without incident. On routine follow-up imaging, the liver mass responded well to the ablation treatment. There were no delayed complications. The follow-up CT performed 9 months after the procedure demonstrated continued local control with complete devascularization of blood flow and continued decrease in size (**Figure 5**).

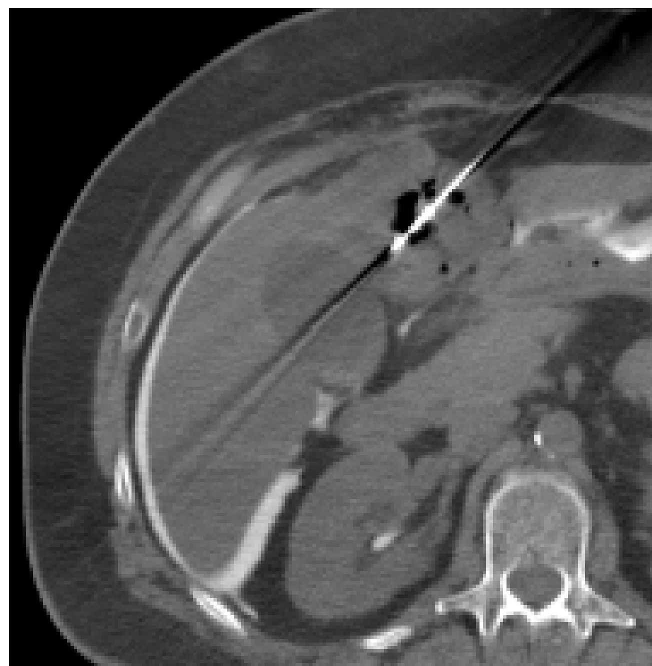

FIGURE 3. Intraprocedural noncontrast computed tomography image at the conclusion of ablation demonstrates the other microwave ablation probe within the mass, with the tip pointed toward the gallbladder.

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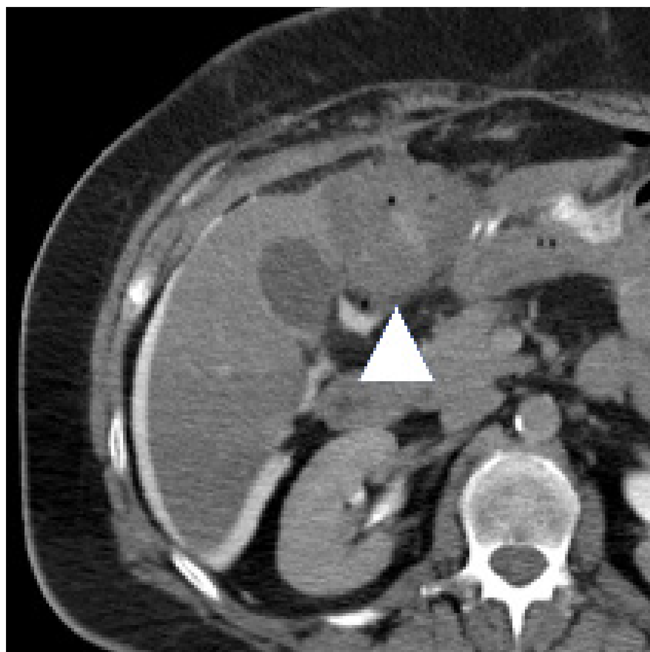

FIGURE 4. Intraprocedural contrast-enhanced computed tomography image in the venous phase, with decreased enhancement in the mass and no appreciable active hemorrhage.

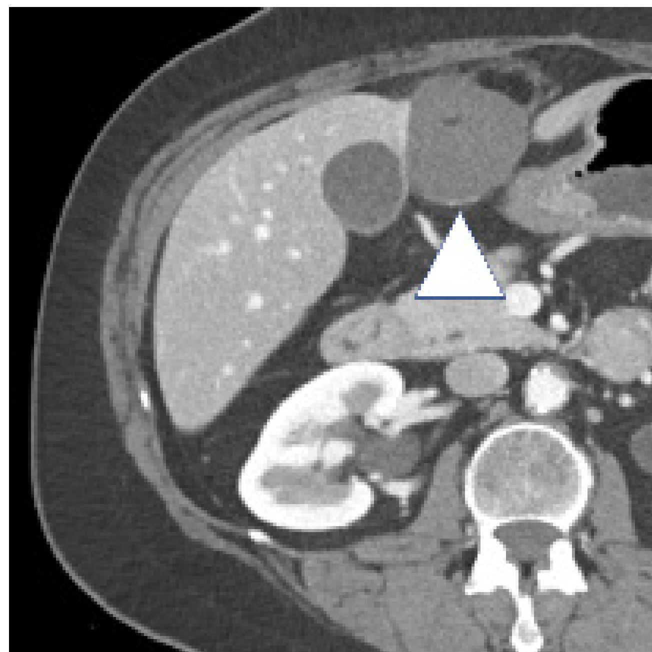

FIGURE 5. Postprocedure computed tomography imaging 9 months post ablation showed continued lack of enhancement and decrease in size of the treated liver mass (arrowhead).

Conclusion

Thermal ablation for sarcoma metastases provides a valuable treatment option that is minimally invasive and tolerable for patients, and provides long-term results. Optimally, the ablation should be planned to provide total local control for all metastases. In patients with extensive metastatic disease, ablation can still provide meaningful treatment during pauses in chemotherapy or to target masses that are growing much more rapidly than others. While ablation is typically applied for tumors <2 cm in diameter, larger tumors can be safely and successfully treated with the appropriate technique, such as this case of the 5-cm mass. The procedure is well tolerated. Most patients are discharged home within 1-2 days of the procedure, with only a few needle puncture marks in the skin as visible evidence to show family and friends.

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From the University of Texas MD Anderson Cancer Center, Houston, Texas.

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Address for correspondence: Steven Yevich, MD, MPH, Associate Professor, Department of Interventional Radiology, Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Houston, TX. Email: syevich@mdanderson.org