

Cryoablation increasingly used to treat multifocal lung cancer

Fereidoun Abtin, MD
Professor of Radiology
Director of Cardiothoracic Fellowship
Director of Santa Monica Outpatient Practice
Department of Radiological Sciences
David Geffen School of Medicine at UCLA



The detection of early-stage lung cancer has increased over the past decade. This is due in part to increased lung cancer screening and use of CT scans. U.S. Preventive Services Task Force recommendations on lung cancer screening — which call for annual screening with low-dose computed tomography of adults ages 50 to 80 who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years — have contributed to increased detection of early-stage lung cancers, including a cohort of patients diagnosed with multifocal primary lung cancers. These include synchronous multifocal lung cancer — multiple primary lung cancer lesions detected at the same time — as well as metachronous lung cancer, in which patients have had lung cancer treated and later present with new, primary lesions in other areas of the lungs.



CT suite with Interventionist performing cryoablation under CT guidance. The patient is under moderate sedation, so is awake and responding to commands.

The presence of primary lesions in multiple locations in the lungs figures significantly in treatment decision-making. Preserving surrounding healthy lung tissue takes on increased significance when treating multiple locations within the lungs, especially for patients whose breathing or overall health is already compromised by other unrelated conditions.

Image-guided percutaneous ablation is an effective treatment option for multifocal lung cancer patients, as well as for other lung cancer patients who are not good candidates for resective surgery. “Lung cancer ablation is a treatment option that I’ve been providing to an ever-increasing group of patients with lung cancer,” says Fereidoun Abtin, MD, professor of radiology, at the joint Cardiothoracic and Interventional Section at the David

Geffen School of Medicine at UCLA. While Dr. Abtin and his UCLA colleagues have used ablation in treating lung cancer for many years, indications for its use have expanded to include multifocal lung cancer as recognition and acceptance of the modality has increased. “Over time, the other members of our multidisciplinary team — including surgeons, oncologists and radiation oncologists — have increasingly recognized the role of ablation, so we get these patients earlier on and are able to locally destroy the cancer cells and control local tumors. It’s a service that we can offer to patients at UCLA that many other centers don’t.”


Dr. Abtin emphasizes, “The value of this procedure is the fact that patients don’t lose lung function, and the ability to

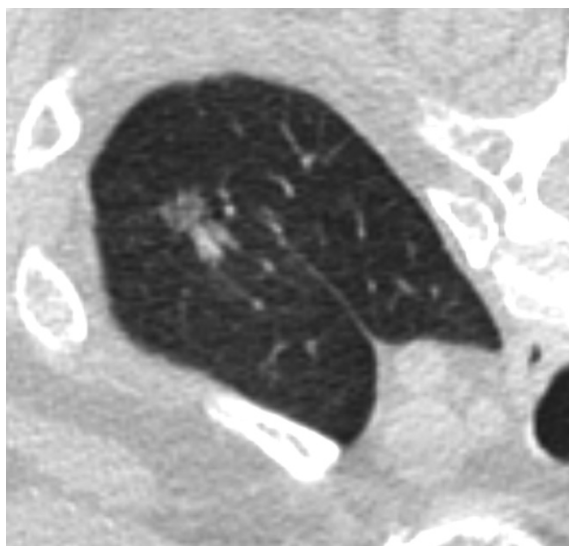
do multiple treatments in patients. There are a handful of patients who have had 10 or 15 lung cancers ablated and they're doing fine. One of my patients ran a marathon two weeks after her ablation."

Most ablations on lung cancer patients at UCLA are cryoablations, which are performed primarily as outpatient procedures without use of general anesthesia. Under conscious sedation and local anesthesia, the cryoprobe is percutaneously introduced inside the tumor using CT guidance. Compressed gas is circulated to the cryoprobe, where its rapid expansion within the probe produces extremely low temperatures. Multiple freeze/thaw cycles can be used to destroy the targeted cells. While only one tumor is treated per outpatient session, multiple sessions can be scheduled to treat additional tumors. Following the ablation procedure, patients are observed, typically for two to four hours, and barring any problems during this observation period, are able to go home. "More than 90% of our patients are able to go home on the same day," says Dr. Abtin. "The remaining 10% includes patients with a single lung, those with serious comorbidities and patients who live too far from our center to return home the same day."

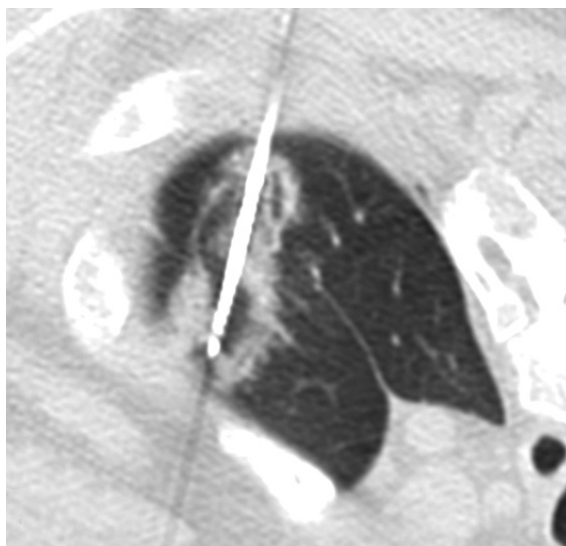
UCLA interventional radiologists use other ablation modalities in addition to cryoablation. "We also use microwave ablation, radiofrequency ablation and irreversible electroporation," states Dr. Abtin. The amount of time it takes to perform the

ablation procedure varies with the ablative modality used, but is on the order of 45 to 90 minutes. The most common complication of percutaneous lung tumor ablation is air leak, which calls for the placement of a chest tube. This is most common among patients who have been heavy smokers. The majority of these patients are also able to return home on the same day.

When Dr. Abtin and his colleagues in the Cardiothoracic and Interventional Section reviewed their lung tumor ablation cases for 2015-16, the most recent year for which five-year survival data was available, they found that patients who underwent ablation for multifocal lung cancer showed a five-year survival rate above 95%. This favorable survival data included patients who had two or three ablations done, and also those who had four or more primary lung cancers treated with individual ablation procedures. "This speaks to the fact that if you treat these patients before these tumors become larger, and before they become invasive, you're able to control the progression of these tumors. None of these patients became respiratory cripples, none required long hospital stays or developed major complications," says Dr. Abtin. The recurrence rate for this group of patients was less than 4%, and all those with recurrences were able to be re-treated, in most cases with another percutaneous ablation procedure. 



A nodule in the left upper lobe of the lung in a patient with multiple lung cancers. She had undergone surgery in the past, but developed seven new lung cancers. This is one of the cancers that was abated using cryoablation.



A probe was placed into the tumor, which generated ice that engulfed the tissue. Cancer cells die immediately at the time of ablation. The patient was sent home with an adhesive bandage covering the site of access and was back on her conference calls the next day.

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