

Volume 2, Number 8 – April 7, 2008

WE WANT TO HEAR FROM YOU!

The issue of *The WCC Note* you are reading is the fourth in our new format, focused on recently released studies related to clinical trial imaging rather than the basics of medical imaging modalities. We hope you find the topics interesting and the brief summaries and conclusions useful – but we'd like to find out how we can improve this publication to better meet your needs.

Here's all you need to do. Just click on this button, answer a few questions, add any comments you like, and e-mail it back to us:

[READER SURVEY >>](#)

We promise to read each returned survey form, publish a summary of the results, and make changes to future issues in response. Thanks in advance for helping us to “educate, inform, and support” you better!

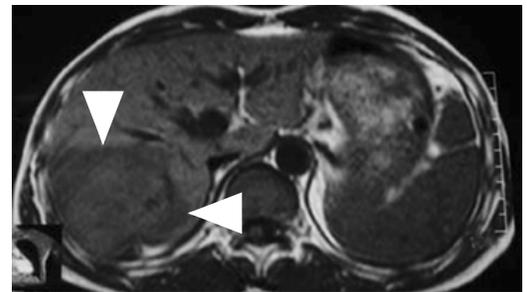
– Stephen J. Pomeranz, M.D., and Resham R. Mendi, M.D.

RFA

MRI Shows Hepatocellular Carcinoma Response to Radiofrequency Ablation

An international team from Syria, Japan, and Italy studied the utility of T1-SPGR MRI in evaluating the early response of hepatocellular carcinoma (HCC) to radiofrequency ablation (RFA) therapy. Within two days of treatment with RFA, 23 patients with a total of 28 HCC nodules had non-contrast MRI, then underwent contrast-enhanced CT one week later. MR assessment was compared with CT results, as well as the presence of local recurrence using 12 months or more of follow-up. Of the 28 nodules, 18 showed hyperintensity covering the entire tumor. In all of these patients, CT showed no enhancement in the tumor, and no local recurrence occurred.

In contrast, in nine of the 28 nodules the central hyperintense zone did not cover the whole tumor; three of these nine had local recurrence. In one nodule, MRI showed no signal change in the treated area, and subsequent CT showed residual viable tumor.¹ **Please note that factors other than size may be used to assess tumor response, including changes in the tumor's blood flow or color in the image. Conclusion: Non-contrast T1-weighted MRI is useful to assess early response of HCC to radiofrequency treatment.**



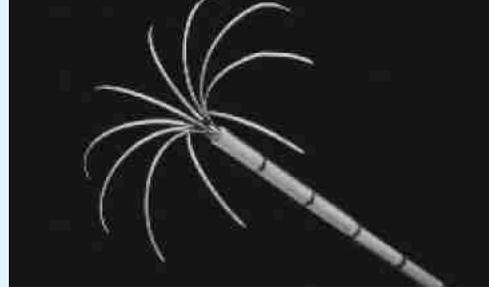
MRI T1-weighted image shows a 115 × 100 × 66 millimeter tumor in the right posterior lobe of the liver (arrows).

What Is Radiofrequency Ablation?

Radiofrequency ablation, or RFA, uses the energy from

radiofrequency waves to kill tissue in the treatment of disease. The tissue to be treated can be localized by using ultrasound, CT, or MRI; next a small needle is inserted into the skin to focus the RF therapy on a specific site. The tissues treated are heated and “burned” using the RF energy. RFA may be done with the patient under conscious sedation or general anesthesia.

RFA has provided a safe, much less invasive alternative to surgery for treatment of many tumors. It has been used successfully in liver, kidney, and adrenal cancers, and is also very useful in treating benign but painful bone tumors known as osteoid osteomas.²



Close-up of an RFA device, showing the array of hook electrodes that are deployed from the tip of the needle after the needle is placed into the tumor.

MRI CONTRAST

Targeted MR Contrast Agent Can Detect Early Tumor Cell Death

Researchers from the United Kingdom have developed and tested a new molecular agent made of gadolinium coupled to a portion of synaptotagmin, a protein that attaches to dying cells. In animal experiments, they found that the new agent attached to apoptotic and necrotic cells, but not to normal viable cells. This agent shows up as bright signal on MR images because it is coupled to gadolinium.³ **Conclusion: This new molecular agent may allow non-invasive, *in vivo* detection of early cell death in tumors using magnetic resonance imaging.**

SOURCES

1. Khankan AA, Murakami T, Onishi H, *et al.* “Hepatocellular Carcinoma Treated with Radio Frequency Ablation: An Early Evaluation with Magnetic Resonance Imaging.” *J Magnetic Resonance Imaging* 2008; 27:546-551.
2. <http://www.cc.nih.gov/drd/rfa/faq.html> (accessed online, 3/18/08).
3. Krishnan AS, Neves AA, de Backer MM, *et al.* “Detection of Cell Death in Tumors by Using MR Imaging and a Gadolinium-Based Targeted Contrast Agent.” *Radiology* 2008; 246: 854-862.

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