

**MRI characteristics of hepatocellular carcinoma
after high-intensity focused ultrasound ablation**

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Purpose: The interpretation of radiographic findings in hepatocellular carcinoma (HCC) treated with high-intensity focused ultrasound ablation (HIFU) is critical for assessing treatment adequacy. MRI is alternatively used for patients with hepatic tumors because it is not satisfactory to evaluate the lipiodol uptaken masses on CT scan. We reviewed our experience and report the unique MRI characteristics of HIFU-treated HCC.

Materials and Methods: Total 54 tumors of 34 patients with hepatocellular carcinoma treated by HIFU were included. Follow-up unenhanced T2-weighted MR images and unenhanced and gadolinium-enhanced T1-weighted MR images were obtained, 2 weeks in all patients, 3 months in 20 patients, and 6 months in 5 patients after ablation. Thermal ablation zone size was analyzed. The signal intensity of ablated tumor and enhancement pattern were also evaluated. Treatment efficacy, and complications were assessed at each time.

Results: The mean tumor size at ablation was 3.4cm, with minimal reduction over time. Ablated lesions were characterized by high signal intensity with variable extent of heterogeneity on T1-weighted images, low signal intensity on T2-weighted images, and peripheral rim enhancement. Eighteen tumors showed nodular enhancement on early arterial phase in the initial postablation MRI, indicating incomplete ablation. Three tumors were recurrent during follow-up period, showing typical enhancement pattern.

All patients showed ablation of the subcutaneous fat and pericostal muscles along the ultrasound port.

Conclusions: The MRI characteristics of successfully ablated HCC include high signal intensity on T1-weighted image and low signal intensity on T2-weighted image with peripheral rim enhancement. Ablated areas may develop areas of heterogeneous signal intensity both on T1 and T2-weighted images, but, thick or nodular enhancing tissue in the region of the ablation zone should raise concern of incomplete ablation or tumor recurrence.