

Differential Diagnosis between Brain Abscesses and Necrotic or Cystic Brain Tumors  
by *in vivo*  $^1\text{H}$  MR Spectroscopy

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**Purpose:** To determine the ability of  $^1\text{H}$  MR spectroscopy (MRS) to differentiate brain abscesses from cystic or necrotic brain tumors.

**Materials and Methods:**  $^1\text{H}$  MRS exam was prospectively evaluated in seven consecutive patients with surgically-proven pyogenic brain abscesses, and seven consecutive patients with necrotic or cystic brain tumors (4 glioblastomas and one each of oligodendroglioma, pilocytic astrocytoma, metastasis from lung cancer).  $^1\text{H}$  MRS was performed on a 1.5T MR unit(Magnetom SP, Siemens) using PRESS sequence (TR/TE/excitations = 2,000/270/128, VOI=2x2x2 cm<sup>3</sup>). Assignment of resonance peaks was based on the previous literature and the results of our *in vitro*  $^1\text{H}$  MRS animal study.

**Results:** In six of seven patients with abscess, there were variable combinations of resonance from lactate, valine, alanine, leucine, isoleucine, and acetate, succinate, and unidentified metabolites (2.2, 2.9, 3.4 ppm). All tumors except one showed only lactate peak. One tumor showed unidentified peak at 1.0 ppm in addition to the peak from lactate

**Conclusion:** Spectral patterns of *in vivo*  $^1\text{H}$  MRS can permit us to differentiate brain abscess from necrotic or cystic tumor in most cases.