Importance of diffusion-weighted imaging in the diagnosis of cystic brain tumors and intracerebral abscesses.

OBJECTIVE: It is often difficult to decide whether a cystic brain lesion is a tumor or an abscess by means of conventional MRI techniques. The immediate diagnosis of a brain abscess is important for the patient's outcome. Our goal was to study the ability of diffusion-weighted imaging and calculation of the apparent diffusion coefficient (ADC) to differentiate between these two pathologies.

PATIENTS AND METHODS: Ten patients (five men, five women) with cystic brain lesions were examined with MRI. The ADC maps were calculated for each subject and the ADC value of each lesion was measured. Histology revealed glioblastoma multiforme in six patients and abscess in four patients.

RESULTS: All brain abscesses showed markedly hyperintense signal changes on diffusion-weighted imaging, whereas the appearance of glioblastoma varied from slightly hyperintense to hypointense signal conversion. The mean ADC value calculated in the six patients with cystic brain tumor was: 2.05 x 10^{-3} mm(2)/s (1.38-2.88 x 10^{-3} mm(2)/s). The mean ADC value of the four patients with brain abscess was: 0.57 x 10^{-3} mm(2)/s (0.38-0.77 x 10^{-3} mm(2)/s).

CONCLUSION: Diffusion-weighted imaging and calculation of ADC maps constitute a helpful tool to differentiate between cystic brain tumors and brain abscesses.