

## Presurgical diagnostic work-up in epilepsy

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**Background:** Hippocampal sclerosis is the most common cause of epilepsy in adults. Patients with intractable seizures are evaluated for surgical treatment and preoperative magnetic resonance imaging (MRI) can help localize epileptogenic lesions. Brain MR imaging using a 3 Tesla scanner and a specially designed “Epilepsy Protocol” and MR Spectroscopy help to evaluate hippocampal volume, internal structures and extensive metabolic impairments which are correlated with the extent of neuropathologic changes in mesial temporal sclerosis. Proton MR Spectroscopy has been shown to be useful in the preoperative evaluation of patients with temporal lobe atrophy, confirming the neuronal dysfunction by detecting low N-acetyl aspartate (NAA). N-acetyl aspartate is almost exclusively concentrated in neurons of the nervous system and has been used as a neuronal marker in 1H-MRS studies. Proton MR Spectroscopy has been shown to be able noninvasively to confirm the epileptogenic hippocampus by showing low levels of N-acetyl aspartate.

**Content:** The presentation reviews the non-invasive epilepsy work-up. Diagnostic work-up in a case of temporal lobe epilepsy from our practice is presented as an illustration. A complex approach including correlation of various factors such as seizure semiology, video-EEG monitoring and brain MRI findings plays a significant role in detecting potential surgical candidates and predicting the outcome of epilepsy surgery.

**Conclusions:** Brain MRI is an important tool in the presurgical epilepsy diagnosis. Specially designed MRI protocols for investigating epilepsy patients significantly increase the chance of detection of epileptogenic lesions.

**Key words:** epilepsy, seizure, brain MRI, hippocampal sclerosis.