MRI-negative epilepsy

see also MRI-negative temporal lobe epilepsy.

Morphometric Analysis Program (MAP) is a useful tool in detecting the epileptogenic lesions in patients with MRI-negative operculoinsular epilepsy. Notably, in order to make the right surgical regime decision, MAP results should always be interpreted in the context of the patient's anatomic-electroclinical presentation [1)].

Identification of the structural lesions that underlie pediatric epilepsy can be challenging. Careful evaluation of the gray-white matter interface is crucial and necessitates multiplanar thin images of high resolution that can differentiate focal lesions from partial volume averaging artifacts created by the innate gyral configuration. Careful evaluation of the hippocampus and of the myelination patterns can further increase the diagnostic yield of the study. Magnetization transfer imaging can call attention to a lesion that is either very subtle or not evident on conventional sequences. Detection of cortical anomalies is best performed early in infancy, preferably before 6 months of age. If the initial magnetic resonance imaging (MRI) scan is performed between 9 and 18 months of age and is negative, a repeat scan after 2 years of age may be necessary [2)].

Treatment

see MRI-negative epilepsy treatment.

Case series

An observational cohort study was performed on 19 MRI-negative epilepsy patients who underwent stereoelectroencephalography guided radiofrequency thermocoagulation (SEEG-guided RF-TC) in an epilepsy center. In addition, 16 MRI-positive patients were included as a reference group. Semiology, electrophysiology, and imaging information were collected. To evaluate the value of locating the MEG cluster, the proportion of the RF-TC contacts located in the MEG cluster out of all contacts used to perform RF-TC in each patient was calculated. All patients underwent the standard SEEG-guided RF-TC procedure and were followed up after the treatment.

Nineteen MRI-negative patients were divided into two groups based on the existence of MEG clusters; 10 patients with MEG clusters were in group I and nine patients without any MEG cluster were in group II. No significant difference was observed in terms of age, sex, type of seizures, or a number of SEEG electrodes implanted. The median of the proportion of contacts in the MEG cluster was 77.0 % (IQR 57.7-100.0 %). The follow-up results showed that the probability of being seizure-free at one year after RFTC in MRI-negative patients with a MEG cluster was 30.0 % (95 % CI 11.6-77.3 %), significantly ($p = 0.014$) higher than that in patients without a MEG cluster; there was no significant difference when compared with MRI-positive patients.

This is the first study to evaluate the value of MEG in SEEG-guided RF-TC in MRI-negative epilepsies. MEG is a useful supplement for patients with MRI-negative epilepsy. MEG can be applied in minimally

invasive treatment. MEG clusters can help identify better candidates and provide a valuable target for SEEG-guided RF-TC, which leads to better outcomes. [3].

1)
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2)
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