

Brain MRI post-processing with map07 in preoperative evaluation of patients with pharmaco-resistant epilepsy – our experience

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Epilepsy is a chronic disease of the central nervous system that affects 1% of the population. The large number of patients with the proper selection of antiepileptic drugs can achieve satisfactory seizure control, while the remaining 25-35% have pharmaco-resistant epilepsy and are considered as candidates for active neurosurgical treatment. Preoperative evaluation of patients with pharmaco-resistant epilepsy can be divided into two phases. Phase I includes non-invasive diagnostic procedures - EEG; continuous video-EEG polygraphic recording; preoperative neuropsychological testing; brain MRI (magnetic resonance imaging), preferentially 3T MRI, with specialized recording techniques including MRI spectroscopy, functional MRI and MRI hippocampal volumetry; post-processing of brain MRI; ictal brain SPECT (Single-Photon Emission Computed Tomography); PET (Positron Emission Tomography) and optionally MEG (magnetoencephalography) with MSI ("Magnetic Source Imaging"). Phase II encompasses invasive methods in carefully selected patients - Wada test; semi-invasive monitoring with sphenoidal electrodes; invasive monitoring (with subdural strip and grid electrodes, depth electrodes, and with cortical stimulation procedure). The most significant neuroradiological procedure in proper selection of candidates suitable for neurosurgery is MRI 3T. Post-processing of brain MRI with MAP07 (Morphometric Analysis Program) is a new sophisticated diagnostic procedure. The program offers a number of graphical post-processing methods (maps) and facilitates the detection and localization of hippocampal sclerosis, focal cortical dysplasias and other types of cortical malformations, which cannot be easily detected by conventional neuroradiological methods. We present our experience with MAP07 software in the preoperative evaluation of patients with pharmaco-resistant epilepsy and selection of candidates for neurosurgical treatment.