SEEG-guided radiofrequency thermocoagulation

Concerns about the impact of open surgery for drug-resistant mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS) have driven interest in minimally invasive techniques. Stereoelectroencephalography guided radiofrequency thermocoagulation (SEEG guided RF-TC) offers an alternative choice but with currently limited efficacy. We developed a procedure for optimally extended thermocoagulative lesions and investigated the efficacy and safety for MTLE-HS in a preliminary observational study.

From June 2016 to August 2017, twenty-two patients were selected for the present study. They met the criteria of unilateral MTLE-HS after noninvasive evaluation and then underwent implantation of a combination of SEEG electrodes to form a high-density focal stereo-array, including one electrode along the long axis of amygdalohippocampal complex and three orthogonal electrodes to widely sample mesial temporal structures. A unilateral epileptogenic zone of mesial temporal structures was confirmed in these 21 patients. SEEG-guided bipolar coagulations were performed between two contiguous contacts of the same electrode, or between two adjacent contacts of different electrodes.

Surgical procedures were well tolerated, with no related complications. At the follow-up of 12 months, 20 patients (95.2%) experienced a >90% decrease in seizure frequency and 16 patients (76.2%) were free of disabling seizures (Engel class I). Among them, eight (38.1%) were classified as Engel class Ia and the other eight (38.1%) as Engel class Ib. Four others (19%) had rare disabling seizures (Engel class II). Only one (4.8%) experienced an Engel class III outcome.

Optimized SEEG-guided RF-TC is a promising complementary option for the treatment of MTLE-HS [1].

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Fan X, Shan Y, Lu C, An Y, Wang Y, Du J, Wang D, Wei P, Fisher RS, Wang Y, Ren L, Zhao G. Optimized SEEG-guided radiofrequency thermocoagulation for mesial temporal lobe epilepsy with hippocampal sclerosis. Seizure. 2019 Aug 30;71:304-311. doi: 10.1016/j.seizure.2019.08.011. [Epub ahead of print] PubMed PMID: 31521052.