

High intensity focused ultrasound thalamotomy guided by MRI (HIFU-MRI)

Abstract

High intensity focused ultrasound thalamotomy guided by MRI (HIFU-MRI) was approved to treat drug resistant essential tremor patients by the FDA (US) in 2012, reporting excellent results in the last 7 years however there is few information in regard to HIFU-MRI in Parkinson 'disease patients. VIN thalamotomy (Radiofrequency, radiotherapy) as well Deep brain stimulation of VIN thalamic have also showed good results in resistant tremor in PD patients but adverse effects and high economical expenses represent a limitation to treat a large number of patients around the globe. We describe in this article our experience with HIFU-MRI guided thalamotomy and inzertotomy in PD patients with drug resistant tremor and described the effects on the other cardinal symptoms such as bradykinesia, rigidity, gait and functional scales in a 12 month follow up 10 patients (mean 68 yo, 2 H-Y and 90% S-E) fulfilling UK brain bank PD criteria with a drug resistant tremor were follow up for 12 month period after a HIFI-MRI thalamotomy/inzertotomy was performed. A target planification of the VIN and the nearby zona inzerta contralateral to the predominant tremor arm were performed after Cranial MRI and CT images fusion and targeting and previous definition of the skull density ratio (SDR). Patients received a mean of 9 sonication, Mean of 1250 jules , 870 watts and timing sonication 13 seconds as well as mean temperature of 62 celsius degree. Neurological examination and MRI control were performed during all the procedure and a final control with a Cranial MRI. An UPDRS III, PDQ8, Glass tremor and a global patient impression scales were performed basal, 6 and 12 month after HIFU-MRI lesions as well as a video record before and at 12 months evaluation.

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