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Evaluation of factors affecting tremor recurrence after MRgFUS thalamotomy

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Background: MRgFUS thalamotomy is a new treatment minimal invasiveness for intractable tremor due to Essential Tremor (ET) or Parkinson's Disease (PD). Objective our study is to identify possible relevant factors contributing to tremor relapse (defined an increase in the FTM score of > 5 points compared to baseline) after MRgFUS thalamotomy in patients with essential tremor (ET) and Parkinson's disease (PD).

Methods: We identified patients with tremor relapse from a series of 80 patients treated with MRgFUS in the institute of L'Aquila. The demographic and clinical characteristics of the study group patients were compared to those of patients who did not relapse in the same follow-up period. Imaging and procedural factors were compared using a control group matched for clinical and demographic characteristics.

Results: Concerning clinical and demographic characteristics, we did not find statistically significant differences in gender and age. Seventy-three percent of patients with tremor relapse were Parkinson's disease patients. Using MRI, we found larger thalamotomy lesions at the 1-year follow-up in the control group with stable outcomes, compared to patients with tremor relapse. In the tractography evaluation, we found a more frequent eccentric position of the DRTt in patients with tremor relapse.

Conclusions: The most relevant determining factors for tremor relapse after MRgFUS thalamotomy appear to be tremor from Parkinson's disease and inaccurate thalamic targeting. Size of the thalamotomy lesion can also influence the outcome of treatment.