

Functional CyberKnife Radiosurgery for Tremor Treatment. Case Report

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Objectives: Stereotactic lesioning in thalamus and basal ganglia to treat tremor was the ancient standard in stereotactic procedures before the introduction of Deep Brain Stimulation. Positive experience in functional neurosurgery with Gamma Knife and linear accelerator has been reported since the first Leksell's experience in 1951. In this paper, we report the first experience of radiosurgery treatment with CyberKnife in a patient with tremor in Parkinson's disease.

Methods: He is a 71 years old men who suffers for Parkinson's disease from several years, presenting with tremor, rigidity and gait disturbance. During the last 12 months, patient was dramatically limited (unable to perform daily activities including feeding) by the disabling tremor. Pharmacological therapy failed in tremor control, and in September 2005, he underwent an electrode implant for deep brain stimulation. After surgery (target: left VIM), patient experienced an excellent tremor improvement. Due to a skin decubitus, in December 2005, the electrode removal was compulsory. In January 2006, the patient underwent a CyberKnife radiosurgery for a left VIM thalamotomy. The previously implanted electrode CT image was used to define the target in the treatment planning. Total dose was 70 Gy at 100% isodose line. The treatment volume was 22.5 mm³ and a 5 mm collimator was adopted.

Results: After treatment, at one months follow up, tremor control was achieved. At the 12 month follow-up, he preserved the achieved results and he returned autonomous in his life activities practice.

Conclusion: This experience suggests that CyberKnife radiosurgery can be useful, especially when an electrode removal is required. In the future, CyberKnife radiosurgery could be proposed as lesional procedure for visible functional targets.