AbstractID: 8260 Title: Localization and Treatment of Essential Tremors using Gamma Knife Radiosurgery

Purpose: To present localization technique and results for radiation treatment of functional disorders using Gamma Knife Stereotactic Radiosurgery (GKSRS). **Method and Materials:** Since one year, we have treated 17 patients with GKSRS. T2 weighted axial MR images were obtained and target coordinates were localized at the planning system to <1mm maximum error and average error of <0.5 mm. The anterior commissure (AC) and poster commissure (PC) planes were identified in the slices. $1/4^{th}$ of the separation between the AC and PC planes was used for the Y distance from PC and X distance was measured lateral to the affected side 11 mm + half width of the 3^{rd} ventricle. The Z coordinate was located at the slice where AC and PC are visualized or half way between the 2 slices where both planes are identified. The dose delivered to the target was 140Gy using a 4 mm collimator. **Results:** The center of the radiation lesion was compared with the planning target on the follow up MR images and was accurate to < 1mm. The diameter of the lesion was measured, and varied from 4 to 5 mm. The tremor decreased with the treatment after 1 to 3 months. One patient (N=17) showed partial response, although the lesion was correctly observed on the follow up MR image. Upon DBS, the active neurons were located at 1 mm lateral to the lesion, which supports our proposal for confirmation of the target prior to treatment with microelectrode registration. **Conclusion:** The GKSRS is a non-invasive and effective treatment for control of tremor, especially in older patients. The invasive procedures used, may cause the risk of intra or extra cerebral hemorrhage, infection, seizures and bleeding from probe placement. This technique was well tolerated by the patients

Conflict of Interest (only if applicable):