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Safety of Laser Ablation for Brain Tumors: Preliminary Results from the Laser Ablation of Abnormal Neurological Tissue using Robotic NeuroBlate System (LAANTERN) Registry

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Introduction

Laser Interstitial Thermal Therapy (LITT) is a novel technology used to treat primary brain tumors and brain metastases. Previous studies are limited by sample size or to single-center experience. The Laser Ablation of Abnormal Neurological Tissue using Robotic NeuroBlate System (LAANTERN) is an ongoing registry designed to address these limitations. We present the preliminary experience with regard to safety of LITT, as well functional status and survival after LITT for brain tumors.

Methods

The LAANTERN registry is designed to collect baseline, procedural, and follow-up data on patients treated with the NeuroBlate® system. Data collected include baseline demographics, intraprocedural data, adverse events, functional status, and survival.

Results

LAANTERN accrued 127 patients treated with NeuroBlate for primary or metastatic brain tumors. There were 68 (54%) females and 33 (46%) males. Median age was 58 (range 10-80). Median Karnofsky Performance Score (KPS) was 90 (range 40-100) at baseline. Of the treated lesions, 61% were primary and 39% were metastatic tumors. Of the primary tumors, 77% were high-grade gliomas, 13% were low grade gliomas, and 10% were other primary tumors. Greater than 90% volumetric ablation was achieved in 75.9% of cases. Mean post-procedure Intensive Care Unit (ICU) and total hospital stay were 1.69±3.4 days and 3.1±4.7 days, respectively. There were 13 procedure-related adverse events in 11 (8.7%) patients, and 5 events in 4 (3.1%) patients were considered serious. At 3 months, KPS was stable or improved in 58.2% of patients. Neurological exam was unchanged or improved in 80.9% and 73.3% of patients at 1 and 6 months, respectively. At 6 months, 76% of metastases and 81% of primary tumor patients were alive.

Conclusions

Preliminary results from the LAANTERN registry demonstrate an acceptable safety profile and satisfactory functional outcomes of LITT in carefully selected brain tumor patients.

Learning Objectives

- To understand the safety profile and most common adverse events after LITT for brain tumors.
- To understand technical and procedural aspects of LITT as reported across multiple institutions.
- To understand outcome measures such as performance status and overall survival in brain tumor patients undergoing LITT.

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