

Evaluation of Functional Outcomes in Gamma Knife Stereotactic Radiosurgery Treatment of Essential and Parkinsonian Tremor - A Private Institution Evaluation

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Abstract

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Abstract

Objective: Our institution has previously reported on effectiveness and side effects of Gamma Knife Thalamotomy (GKT) for treatment resistant essential tremor(ET) and Parkinsonian tremor(PT). The objective of this study was to examine the functional outcomes and side effect profile of patients with Essential and Parkinsonian tremor, resistant to medical therapy, treated with GKT.

Methods: Fifteen-year review of our experience with medically refractory patients treated with GKT for disabling ET and PT. Previous treatments included DBS (1/91) and medications (58/91). Utilizing the Leksell treatment planning system, gamma knife was utilized to target the ventralis inter-mediis (VIM), target dose ranged from 125-130Cy, utilizing a single 4mm shot. Effectiveness of therapy and evaluation of side effects was evaluated utilizing the Archimedes spiral test, in combination with patient follow ups.

Results: Complete resolution or significant improvement of tremor symptoms occurred in 85% of patients (77/91) at an average of 6 months post treatment. Archimedes tremor score pre and post op was utilized for analysis of therapeutic benefit. Median post-operative follow-up for evaluation was 16 months (duration 1-64). Side effect symptoms were evaluated clinically and radiographically utilizing MRI. Radiographically confirmed edema was noted on the side of treatment in 15% of patients (14/91). Major side effects included extremity weakness in 13% of patients. Unsteady gait developed in 5% (5/91), with 2% requiring a cane or wheel chair. Visual change in 2% (2/91), this manifested as blurriness. Verbal change 1% (1/91) manifested as expressive aphasia.

Conclusion: Gamma Knife Thalamotomy provides effective relief from tremors, comparable to that of other standard of care treatment options. Persistent side effects were noted in 15% of patients, of which 50% diminished in time.