CNS 2016 ANNUAL MEETING
San Diego CALIFORNIA
SEPTEMBER 24-28, 2016

Prospective Comparison of Long-term Pain Relief Rates After First-time Microvascular Decompression, Stereotactic Radiosurgery, or Radiofrequency Ablation for Idiopathic Trigeminal Neuralgia

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Introduction

Common surgical treatments for trigeminal neuralgia (TN) include microvascular decompression (MVD), stereotactic radiosurgery (SRS), and radiofrequency ablation (RFA). Using a large prospective longitudinal database, we aimed to 1) directly compare long-term pain control rates for first-time surgical treatments for idiopathic TN and 2) identify predictors of pain control.

Methods

We reviewed a prospectively collected database for all patients with TN who underwent treatment for TN between 1997 and 2014 at UCSF. Standardized data collection of clinical data, surgical procedure and postoperative outcomes were performed. Analyses were limited to those receiving first-time procedure for treatment of idiopathic TN with >1 year follow-up.

Results

312 patients underwent first-time treatment for idiopathic TN (152 MVD, 152 SRS, and 8 RFA) with >1 year follow-up. Mean follow-up durations were 54±37 months for MVD, 50±39 months for SRS, and 58±58 months for RFA. Immediate or short-term (<3 month) postoperative pain-free rates were 96% for MVD, 78% for SRS, and 100% for RFA. Pain-free rates at one, five, and ten years for MVD were 90.8%, 67.5%, and 60.5% respectively. Those for SRS were 73.0%, 51.1%, and 26.8% and for RFA, 87.5%, 25.0%, and 0%, respectively. Median time to pain recurrence was 151 months for MVD, 66 months for SRS, and 35 months for RFA. Compared to MVD alone, the subset of patients who received additional partial sensory rhizotomy had shorter pain-free interval (151 months vs 60 months, $p<0.001$, log-rank). Multivariate regression demonstrated that MVD was superior to SRS in achieving pain control (HR 0.418 [0.27-0.647], $p<0.001$), and that shorter preoperative symptom duration (HR 1.003 [1.0005-1.005], $p=0.018$) and presence of postoperative sensory changes (HR 0.547 [0.362-0.829], $p=0.004$) were associated with favorable outcome.

Conclusions

Patients who received MVD had longer pain-freedom compared to those of SRS and RFA. For those receiving SRS, postoperative sensory change was predictive of favorable outcome.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the efficacy of MVD, SRS, and RFA for first-time treatment of idiopathic TN, 2) Identify predictors of favorable outcome, and 3) Describe limitations for ablative and non-ablative procedures for TN treatment.

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