Magnetic Resonance-Guided Laser Ablation for Postradiosurgery Metastatic Recurrence or Radiation Necrosis: Institutional Experience

Robert Nicholas Hernandez MD; Purvee D Patel BA; Shabbar F. Danish MD
Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, USA

Introduction

Enhancing lesions that demonstrate progression after radiosurgery for metastatic brain tumors are often tumor recurrence or radiation necrosis. Magnetic resonance-guided laser-induced thermal therapy (LITT) is a minimally-invasive treatment option for postradiosurgery recurrence or radiation necrosis. We report the largest prospective series to date of LITT for the treatment of recurrent enhancing lesions after radiosurgery for brain metastases.

Methods

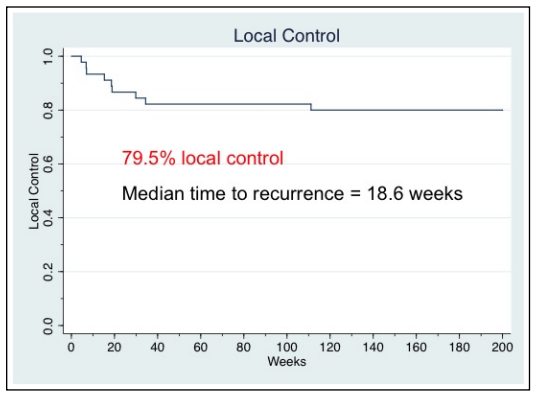
Patients with recurrent metastatic intracranial tumors or radiation necrosis who had previously undergone radiosurgery and had a Karnofsky performance status of >70 were eligible for LITT. The primary endpoint was local control using MR scans at intervals of >4 weeks. Additionally, we report overall survival, perioperative complications, and 30-day readmission rates.

Results

33 patients (ages 46-90 years) who underwent 45 procedures for 44 enhancing lesions were available for follow-up. The mean pre-procedure lesion size measured 3.45 cm3 (range 0.23-10.52 cm3). At a median follow-up of 43.1 weeks (range 4.9-181.9 weeks), local control was 79.5% (35 of 44 lesions), and overall survival at 6, 12, 18, and 24 months was 83.3%, 46.9%, 23.3%, and 13.3%, respectively. Median time to recurrence was 18.6 weeks. 96% of patients not on preoperative steroids were successfully weaned off steroids in the postoperative period, compared to only 64% of patients on steroids preoperatively who were able to be successfully weaned off steroids (p=0.014). Though not statistically significant, of the patients entering LITT on steroids, those who were able to be weaned off in the postoperative period had longer overall and progression-free survival.

Conclusions

LITT is an effective and safe treatment option for local control of recurrent metastatic brain disease that has failed radiosurgery. Offering LITT prior to the need to initiate steroids may lead to better outcomes.



Learning Objectives

By the conclusion of this session, participants should be able to: 1) Identify brain lesions appropriate for LITT, 2) Discuss local control of recurrent brain metastasis or radiation necrosis with LITT, 3) Discuss the possible effect of steroids in patients undergoing LITT 4) Identify a treatment option for patients with recurrent metastatic disease that have failed radiosurgery.

References

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