

## Stereotactic Radiosurgery For Reversal of Neurologic Deficits in CNS Lymphoma

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## Abstract

**Objectives:** Primary CNS lymphoma is a rare type of non-Hodgkin lymphoma that accounts for 4% of newly diagnosed central nervous system (CNS) tumors. At the time of presentation most patients have one solitary brain lesion with leptomeningeal involvement in 20%. To date there have been no prospective trials evaluating partial brain irradiation in CNS lymphoma. We investigate whether partial brain irradiation using stereotactic surgery can offer palliative benefits with reversible of neurologic deficits.

**Methods:** A 75 year old woman presented in 2008 with a right frontal lobe brain mass, which on stereotactic biopsy showed primary CNS lymphoma. She was treated with high-dose IV methotrexate with complete response and remained free until 2013. Unfortunately, she recurred and was treated with a combination of intrathecal cytarabine chemotherapy and repeat high-dose IV methotrexate. Her therapy was successful in terms of treating the leptomeningeal disease, however, her solid brain tumor continued to progress in causing left-sided hemiparesis. The decision was made to proceed with salvage palliative stereotactic radiosurgery boost to the solid tumor in hopes of local control.

**Results:** The patient was treated in November 2013. The primary CNS lymphoma solid brain tumor had a 3D volume of 2.09mL. It was treated with a single isocenter utilizing a hybrid 6mm, 8mm sector hybrid shots. Maximum dose delivered was 48.6 Gy by prescribing 17Gy to the tumor margin at 35% isodose line, which provided 99% tumor coverage with a treatment volume of 4.11mL. A 100% of the tumor received a minimum dose of 15.75Gy and 90% of the tumor volume received a minimum dose of 24.95Gy. Post treatment MRI showed improvement of the right inferior frontal gyrus mass now measuring approximately 1 cm, previously measuring up to 2 cm. Marked interval improvement of the surrounding edema. Serial brain MRIs every 3 months showed only post treatment changes. The patient remained disease free for 38 months until an MRI in January 2017 showed new area of contrast enhancement in the right frontal lobe concerning for recurrent disease.

**Conclusions:** Despite the highly responsive nature of PCNSL to initial treatments, local control remains the largest obstacle in the treatment of this disease. Tumor recurrence occurs in 90% of patients. We believe that due to this patient's age her quality of life were significantly improved using our gamma knife approach. This treatment regimen may be reasonable in patients with complications that require immediate treatment and also in those with comorbidities that are contraindications to standard therapy.

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