Current dosing paradigm for stereotactic radiosurgery alone after surgical resection of brain metastases needs to be optimized for improved local control.


Department of Radiation Oncology, Emory University, Atlanta, GA; Winship Cancer Institute, Emory University, Atlanta, GA.

Abstract

PURPOSE: To describe the use of radiosurgery (RS) alone to the resection cavity after resection of brain metastases as an alternative to adjuvant whole-brain radiotherapy (WBRT).

METHODS AND MATERIALS: Sixty-two patients with 64 cavities were treated with linear accelerator-based RS alone to the resection cavity after surgical removal of brain metastases between March 2007 and August 2010. Fifty-two patients (81%) had a gross total resection. Median cavity volume was 8.5 cm$^3$. Forty-four patients (71%) had a single metastasis. Median marginal and maximum doses were 18 Gy and 20.4 Gy, respectively. Sixty-one cavities (95%) had gross tumor volume to planning target volume expansion of ≥1 mm.

RESULTS: Six-month and 1-year actuarial local recurrence rates were 14% and 22%, respectively, with a median follow-up period of 9.7 months. Six-month and 1-year actuarial distant brain recurrence, total intracranial recurrence, and freedom from WBRT rates were 31% and 51%, 41% and 63%, and 91% and 74%, respectively. The symptomatic cavity radiation necrosis rate was 8%, with 2 patients (3%) undergoing surgery. Of the 11 local failures, 8 were in-field, 1 was marginal, and 2 were both (defined as in-field if ≥90% of recurrence within the prescription isodose and marginal if ≥90% outside of the prescription isodose).

CONCLUSIONS: The high rate of in-field cavity failure suggests that geographic misses with highly conformal RS are not a major contributor to local recurrence. The current dosing regimen derived from Radiation Therapy Oncology Group protocol 90-05 should be optimized in this patient population before any direct comparison with WBRT.

Copyright © 2012 Elsevier Inc. All rights reserved.

PMID: 22516387 [PubMed - in process]