LINAC-Based Hypofractionated Stereotactic Radiotherapy Control Rates for Resected Radioresistant Brain Metastases

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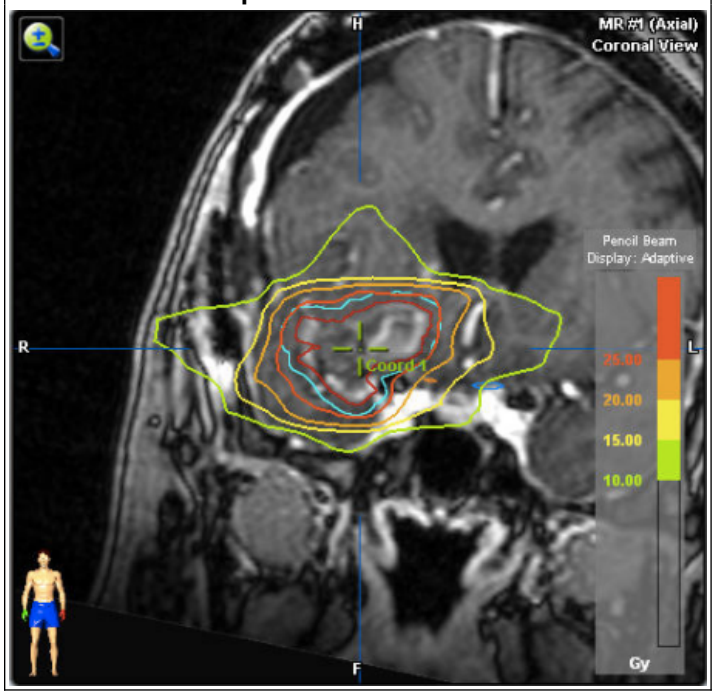
Introduction

Melanoma and renal cell carcinoma (RCC) have historically been felt to be relatively radioresistant. The goal of this study was to retrospectively evaluate the role of post-operative resection bed hypofractionated stereotactic radiotherapy (SRT) in achieving local control in these histologies.

Methods

Between October 2009 - December 2013, 29 patients (22 male, 7 female, median age 63, 33-86) were treated with post- operative SRT to 32 metastatic tumor beds. 21 patients had melanoma and 8 had RCC. All patients were determined to have gross tumor resection. The mean PTV was 21.6 cm3 (4.9-81.73 cm3) with a median prescribed dose of 2500 cGy (2000-3000) administered in 5 daily fractions.

Coronal View of Dose Distribution for Radioresistant Post-Operative Brain Metastasis



Results

Median follow up was 8.7 months (range, 1.7- 22.9). Recurrences were noted locally in 4 of the treatment sites (13%), and distantly in 13 patients (45%). While median local-brain recurrence free survival (LBR-FS) was not reached, median distant-brain recurrence free survival (DBR-FS) was 6.8 months (95% CI 0-14.7). At 12 months, the local control rate and distant brain control rate were 84% and 47%, respectively. Log-rank analysis showed a statistically significant increase in DBR-FS in patients with a single brain metastasis compared to those with multiple brain metastases($p<0.001$), whereas KPS >70 vs. >70 ($p=0.12$) and age < 65 vs. = 65 ($p=0.23$), did not achieve significance. No patients developed late grade 3 toxicity.

Results of Post-Operative Radiotherapy Control on Radioresistant Brain Metastases

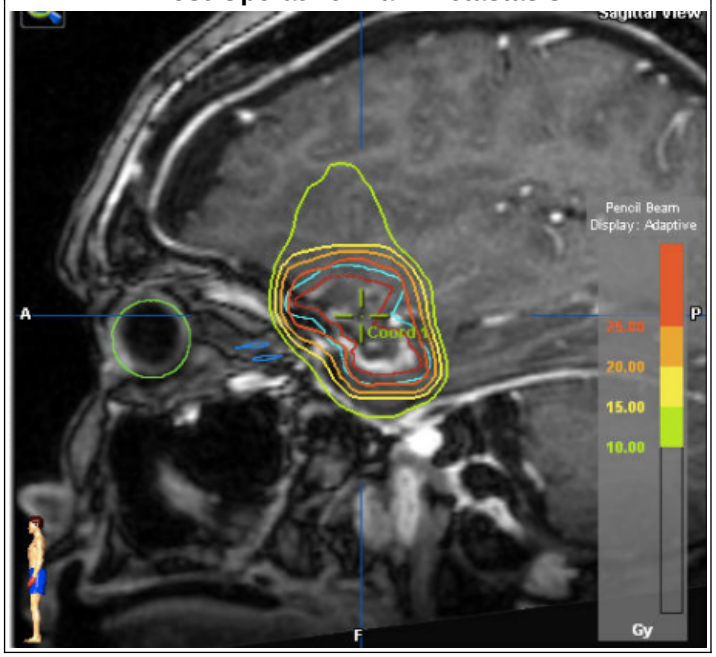
Results	
Patients	29
Lesions	32
Gross Tumor Resection	32/32 (100%)
Mean Follow Up (Range)	8.7 months
Follow Up Range	1.7-22.9 months
12 Month Local Control Rate	84%
12 Month Distant Control Rate	47%

Prognostic Factors for DB-RFS		p value
Single Metastasis		0.001

Conclusions

Post operative bed SRT is well tolerated in our patient cohort and results in high local control rates. This approach may be safely considered in selected melanoma and RCC patients.

Sagittal View of Dose Distribution for Radioresistant Post-Operative Brain Metastasis



Learning Objectives

By the conclusion of the session the participants should 1) Understand the challenges in particular radioresistant tumors 2) Appreciate the role of radiation therapy and surgery to the brain in selected patients 3) Understand rates of control in the brain with combined approaches of surgery and radiation therapy.