

# CLINICAL PAPER /

## BRAIN METASTASES



**Clinical application of RapidArc volumetric modulated arc therapy as a component in whole brain radiation therapy for poor prognostic, four or more multiple brain metastases**  
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### ABSTRACT

#### Purpose

To determine feasibility of RapidArc in sequential or simultaneous integrated tumor boost in whole brain radiation therapy (WBRT) for poor prognostic patients with four or more brain metastases.

#### Materials and Methods

Nine patients with multiple ( $\geq 4$ ) brain metastases were analyzed. Three patients were classified as class II in recursive partitioning analysis and 6 were class III. The class III patients presented with hemiparesis, cognitive deficit, or apraxia. The ratio of tumor to whole brain volume was 0.8-7.9%. Six patients received 2-dimensional bilateral WBRT, (30 Gy/10-12 fractions), followed by sequential RapidArc tumor boost (15-30 Gy/4-10 fractions). Three patients received RapidArc WBRT with simultaneous integrated boost to tumors (48-50 Gy) in 10-20 fractions.

### CONCLUSION

#### Results

The median biologically effective dose to metastatic tumors was 68.1 Gy<sub>10</sub> and 67.2 Gy<sub>10</sub> and the median brain volume irradiated more than 100 Gy<sub>3</sub> were 1.9% (24 cm<sup>3</sup>) and 0.8% (13 cm<sup>3</sup>) for each group. With less than 3 minutes of treatment time, RapidArc was easily applied to the patients with poor performance status. The follow-up period was 0.3-16.5 months. Tumor responses among the 6 patients who underwent follow-up magnetic resonance imaging were partial and stable in 3 and 3, respectively. Overall survival at 6 and 12 months were 66.7% and 41.7%, respectively. The local progression-free survival at 6 and 12 months were 100% and 62.5%, respectively.

#### Conclusion

RapidArc as a component in whole brain radiation therapy for poor prognostic, multiple brain metastases is an effective and safe modality with easy application.