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

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 (≥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 Gy10 and 67.2 Gy10 and the median brain volume irradiated more than 100 Gy3 were 1.9% (24 cm3) and 0.8% (13 cm3) 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.