

Clinical outcomes of fractionated stereotactic radiotherapy for intact and postoperative radioresistant renal cell carcinoma and melanoma brain metastases

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Purpose

Fractionated Stereotactic Radiotherapy (FSRT) may be an optimal strategy for radioresistant renal cell carcinoma (RCC) and melanoma brain metastases (BM). We reviewed our institutional experience of FSRT to intact BM and postoperative cavities for patients with melanoma and RCC.

Materials and Methods

We retrospectively identified consecutive patients with melanoma and renal cell carcinoma with unresected or resected BM treated with FSRT at our institution from 1/2018 to 1/2021. Time to event outcomes were estimated using the Kaplan-Meier method with log-rank tests and multivariable Cox regression analyses.

Results

We identified 44 patients with a total of 64 BM: 31 intact (48.4%) and 33 resected BMs (51.6%). Thirty-six (81.8%) were melanoma and eight (18.2%) were RCC. The majority of intact BM (n=22/31; 71%) and cavities (n=21/33; 64%) were treated to 30 Gy (24-30) in 5 fractions and 25 Gy (24-35), respectively. Median PTV volume for intact BM was 5.04 cc (1.2-19.8) and for resected BM was 16.7 cc (4.8-89.1). Median interval from planning MRI to FSRT was 10 days (3-28). Median time from surgery to FSRT was 37 days (9-90). At 18.6 months median follow-up, local and intracranial distant failures were observed in 4 and 20 patients, respectively. Our cohort had a local recurrence-free survival (LRFS) of 83% and overall survival (OS) of 57% at 12 months; no difference between primary FSRT versus surgery followed by FSRT (p=0.93 and p=0.52, respectively). On MVA, higher FSRT dose was associated with better local control (p=0.01). Radiation Necrosis (RN) was observed in eight treatment areas (12.5%). Neither resection status (p=0.99) nor PTV volume (p=0.61) were associated with RN.

Conclusion

FSRT is safe and effective in both definitive and adjuvant management of radioresistant brain metastases, with higher radiation doses associated with better local control rates.

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