RTRB-06. TIME BETWEEN DIAGNOSTIC MRI AND FRAME-FIXED STEREOTACTIC RADIOSURGERY PLANNING MRI IS ASSOCIATED WITH BRAIN METASTASIS GROWTH BUT NOT WORSE LOCAL CONTROL

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BACKGROUND: Frame-fixed stereotactic radiosurgery (FFSRS) and frameless SRS precisely target brain metastases (BM). Seymour et al. recently showed patients treated with frameless SRS planned on MRI completed ≥14 days before treatment delivery have worse local control. An advantage of FFSRS is acquisition of planning MRI on day of SRS. We sought to describe BM growth (BMG) before SRS by comparing the preceding diagnostic MRI (dMRI) and FFSRS MRI scans. METHODS: Patients treated with FFSRS for BM at our institution from 2010 through 2013 were retrospectively reviewed. We identified 236 patients (1302 BM) without upfront surgical resection who had a dMRI for comparison of BM size on FFSRS MRI. Post-FFSRS local failure free progression (LFFP) and overall survival (OS) were compared by log-rank tests. RESULTS: Median imaging follow up was 10 months. Mean size [95% CI] of largest BM was 1.4 cm [1.2-1.5]. BMG was observed on FFSRS MRI compared to dMRI for 30% patients. Mean time interval between dMRI and FFSRS was 25 days, and time interval was associated with BMG (Pearson’s r = 0.14, p = 0.02). The frequencies of BMG for time intervals between dMRI and FFSRS of <7, 7-13, 14-20, 21-27, and ≥28 days were 11%, 12%, 32%, 36% and 38% respectively (p = 0.02, chi square). Melanoma patients more commonly had BMG (p = 0.03), but chemotherapy, neurologic symptoms, and dMRI slice thickness were not associated with BMG. Patients with BMG at FFSRS had similar LFFP compared to patients without growth (82% versus 88% at 6 months, p = 0.71), and OS did not differ (p = 0.47). CONCLUSION: Time between diagnostic MRI and SRS is associated with BMG, but LFFP is not compromised when patients receive FFSRS. Over a third of patients have clear BMG at SRS delivered 14 days after dMRI. For frameless SRS, BMG after planning MRI may lead to marginal miss.