

gated the extent to which various clinical factors influence decision making. **METHODOLOGY:** We created 2 sets of surveys: one for Medical-/Clinical-/Neuro- oncologists and another for Radiation oncologists/Neurosurgeons. Surveys were conducted online or on-line. Following administration, data was tabulated and analyzed. Statistical analyses were performed using Fisher's exact test. **RESULTS:** Of 361 respondents, 250 were Radiation oncologists/Neurosurgeons, and 111 were Medical-/Clinical-/Neuro- oncologists. For patients with 1–3 brain lesions, all < 2cm, 34% of respondents recommended systemic therapy alone as first-line treatment. In contrast, only 15% recommend systemic therapy alone for >9 lesions, at least one > 2cm. Medical-/Clinical-/Neuro- oncologists were more likely to recommend systemic therapy alone compared to Radiation oncologists/ Neurosurgeons for 1–3 lesions, all < 2cm (53% vs. 28%, $p < .0001$). For patients with > 9 BrM, one >2cm diameter, Medical-/Clinical-/Neuro- oncologists were not significantly more likely to recommend systemic therapy alone (20% vs 13%, $p = .11$). **DISCUSSION:** Our results reveal that significant numbers of physicians recommend systemic therapy alone as first-line therapy in BrM and that management decisions correlate with a physician's type of practice. These findings underscore the need for prospective clinical trials to direct appropriate BrM management.

RADI-09. DEFINING PROGRESSION IN PATIENTS TREATED WITH TEN OR MORE BRAIN METASTASES FOLLOWING STEREOTACTIC RADIOSURGERY

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BACKGROUND: An increasing trend has been to elect for Stereotactic Radiosurgery (SRS) for the treatment of brain metastases. Progression following treatment is typically defined as a 20% increase in the initial lesion volume treated. Challenges in defining progression can arise as the reported incidence of pseudoprogression or radiation necrosis following treatment ranges from 5%-30%. The purpose of this study was to assess patterns of failure in patients treated with 10 or more brain metastases. **METHODS:** From March 2014 to April 2018, fifty-five patients with 10 or more total brain metastases were retrospectively reviewed following frame-based radiosurgery to a dose of 12–20 Gy. Post-treatment MRI scans were used to assess tumor response in 3 month intervals. Tumor control was defined as tumor volume ≤ 1.2 times the baseline tumor volume at each measured interval. **RESULTS:** Fifty-five patients received 75 total radiosurgery treatments to 692 tumors. Forty patients received synchronous treatment, while 15 received metachronous treatment. 20 patients (36%) and 72 tumors (10%) experienced progression following treatment. 46 tumors were larger after first MRI in 15 patients (28%). Of these 15 patients, eight had complete resolution in 15 tumors on subsequent scan. Of the eight patients who had resolution, six patients received immunotherapy during and after treatment and all but one patient saw an initial increase >100% of their initial tumor volume. Median overall survival was 11 months. Univariate analysis revealed an association between larger brain volumes irradiated with 12 Gy and decreased overall survival ($p < 0.05$). **CONCLUSION:** It is important to consider tumor growth velocity and concurrent therapy when assessing true progression after SRS treatment of brain metastases.

RADI-10. THERAPEUTIC EFFECTS OF fSRS IN 44 CASES OF BRAIN METASTASES OF NSCLC WITH A MAXIMUM DIAMETER ≥ 4 CM AND ANALYSIS OF ITS PROGNOSTIC FACTORS

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OBJECTIVE: To analyze the therapeutic effects of fSRS on brain metastases of NSCLC with a maximum diameter ≥ 4 cm, and explore the prognostic factors. **METHODS:** A retrospective analysis was conducted on the clinical data of 44 cases of brain metastases of NSCLC with a maximum diameter ≥ 4 cm in Guangdong Sanjiu Brain Hospital from January 2006 to December 2016. RANO criteria were adopted for imaging evaluation at 3 months after completion of radiotherapy. One- and 2-year survival rates were calculated and the differences in survival rates between groups were analyzed with Log-rank test. Kaplan-Meier method was used in univariate analysis to investigate the effects of KPS, RPA classification, number of metastases, total lesion volume, systemic treatment and surgery on prognosis; and Cox regression model in multivariate analysis. **RESULTS:** The postoperative imaging evaluation showed that there were 5 cases of CR, 20 of PR, 12 of SD and 7 of PD. The median PFS, OS, 1- and 2-year survival rates were 6 months, 16 months, 65.9% and 20.5%, respectively. KPS, RPA classification, number of metastases and surgery had no significant correlations with prognosis. However, systemic treatment and the maximum lesion volume <28.3cc were considered as favorable factors related to prognosis ($P = 0.046, 0.027$). Moreover, the maximum lesion volume <28.3cc was

found to be the independent prognostic factor for the survival ($P = 0.035$). **CONCLUSION:** Treatment of brain metastases of NSCLC with a maximal diameter ≥ 4 cm with fSRS is proved to be feasible. The maximum lesion volume is related to prognosis. Systemic treatment (chemotherapy, TKI treatment, etc.) may improve prognosis, but more cases are needed to investigate the prognostic significance.

RADI-11. NRG ONCOLOGY CC001: A PHASE III TRIAL OF HIPPOCAMPAL AVOIDANCE IN ADDITION TO WHOLE-BRAIN RADIOTHERAPY (WBRT) PLUS MEMANTINE TO PRESERVE NEUROCOGNITIVE FUNCTION IN PATIENTS WITH BRAIN METASTASES (BM)

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BACKGROUND: NRG CC001, a phase III trial of WBRT+mementine (WBRT+M) with or without Hippocampal Avoidance (HA), sought to assess the neuro-protective effects of lowering the radiation dose received by the hippocampus. **METHODS:** Patients (pts) with brain metastases were stratified by RPA class and prior radiosurgery/surgery and randomized to either WBRT+M or HA-WBRT+M (30Gy/10 fractions). Standardized neurocognitive function (NCF) tests were performed at baseline, 2, 4, 6, and 12 months (mos.). The primary endpoint was NCF failure, defined as decline using the reliable change index on Hopkins Verbal Learning Test-Revised, Trail Making Test, or Controlled Oral Word Association. Cumulative incidence estimated NCF failure (death without NCF failure was competing risk); between-arms differences tested using Gray's test. Deterioration at each collection time point was tested using a chi-square test. Patient-reported symptoms were assessed using the MD Anderson Symptom Inventory with Brain Tumor module and analyzed using mixed effects models and t-tests. **RESULTS:** From 7/2016 to 3/2018, 518 patients were randomized. Median follow-up was 7.9 mos. HA-WBRT+M was associated with lower NCF failure risk (adjusted HR=0.74, $p = 0.02$) due to lower risk of deterioration in executive function at 4 mos. ($p = 0.01$); and encoding ($p = 0.049$) and consolidation ($p = 0.02$) at 6 mos. Age ≤ 61 predicted for lower NCF failure risk (HR=0.60, $p = 0.0002$); non-significant test for interaction indicated independent effects of HA and age. Patient-reported fatigue ($p = 0.036$); difficulty speaking ($p = 0.049$); and problems remembering things ($p = 0.013$) at 6 mos. favored the HA-WBRT+M arm. Imputation models accounting for missing data also favored the HA-WBRT+M arm for patient-reported cognition ($p = 0.011$) and symptom interference ($p = 0.008$) at 6 mos. Treatment arms did not significantly differ in toxicity; intracranial progression or overall survival. **CONCLUSIONS:** While achieving similar intracranial control and survival; Hippocampal Avoidance during WBRT+M for brain metastases better preserves NCF and patient-reported symptoms. Supported by UG1CA189867 (NCORP) and DCP from the NCI.

RADI-12. LEPTOMENINGEAL FAILURE AFTER PREOPERATIVE VERSUS POSTOPERATIVE RADIOSURGERY

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INTRODUCTION: Postoperative stereotactic radiosurgery (postop SRS) is potentially complicated by difficulty defining the target volume and the risk of leptomeningeal seeding at the time of surgery. It is hypothesized that preop SRS may render cells less viable to disseminate in the leptomeningeal space. This retrospective study compares the leptomeningeal dissemination (LMD) rate for preop versus postop radiosurgery. **METHODS:** We identified 140 patients with brain metastases who underwent resection and radiosurgery at the University of Alabama at Birmingham including 91 postop patients (2005–2015) and 49 preop patients (2011–2018). The preop group included 19 patients enrolled in a phase I trial of preoperative