(range 1 – 89.7 months). Dose for repeat radiosurgery was 18–25 Gy in 1–5 fractions, and brachytherapy dose was 55–65 Gy at 5 mm depth. Twelve lesions subsequently had imaging evidence of radionecrosis vs. progression. Of these, eight underwent repeat resection with pathology demonstrating radiation necrosis in five patients (n=4 with SRS, n=1 with brachy) and tumor recurrence in 3 (n=2 with brachy, and n=1 with SRS). Toxicities included: Steroids, 14(35%); imaging progression/necrosis 12(30%); grade 3/4 event, 3(20%); and surgically confirmed radionecrosis 5(12.5%). Local control of retreated lesions at 6 months is 85.5%, and at 12 months is 79.3%, OS at 1 year is 52.5% and at 2 years 46.6%. Local control at one year for repeat stereotactic treatment was 82.9% and for Cs131 brachytherapy was 80.8% CONCLUSIONS: Aggressive re-irradiation after resection for pathologic confirmation appears to be appropriately safe and effective for the majority of patients after local failure of initial radiosurgery.

RADI-23. EXPLORING THE OPTIMAL TIMING OF ROUTINE INITIAL SURVEILLANCE MRI FOLLOWING TREATMENT OF BRAIN METASTASES WITH STEREOTACTIC RADIOSURGERY: A COMPARISON OF TWO APPROACHES

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PURPOSE: To measure the value of early initial surveillance MRI scans in patients with brain metastases undergoing stereotactic radiosurgery (SRS), as MRI scans are a significant cost and patient stressor. METHODS: We identified a retrospective cohort of patients with brain metastases treated with SRS and followed at a single institution with scheduled 6-week or 12-week initial surveillance MRI. Imaging interval was based on policy of different providers. Outcome measures included new/progressive lesions, salvage treatment, detection of new lesions before symptoms, and use of surgical resection. RESULTS: Two hundred patients were included: 100 consecutive patients scanned with 6-week and 12-week imaging. Eighty-seven and 74 patients in each group had available follow-up imaging and were analyzed. Median time to MRI was 6.7 weeks and 13.5 (p<.001). No difference in primary site, prior SRS, number of treated brain metastases, or use of targeted therapy/immune checkpoint inhibitors was detected. A lower percentage of patients with 6-week MRI had controlled extracranial disease at initial treatment (30% vs 47%,p=.003). Twenty-eight percent with 6-week MRI had findings concerning for new/progressive disease, compared to 47% with 3-month MRI (p=0.01). Fifteen percent (10/87) with 6-week MRI underwent intervention (i.e. SRS, whole brain radiotherapy, or surgery) compared to 34% (20/74) with 12-week MRI (p=0.004). Of patients receiving SRS, a higher percentage had new/worsening neurologic symptoms (45% vs 30%) at follow-up although a lower percentage had new lesions >1cm (20% vs 50%) when discovered. One patient in each group underwent surgical salvage. CONCLUSION: While shorter 6-week interval MRI surveillance post-SRS may detect new/progressive disease less frequently than 12-week MRI surveillance intervals, short interval MRI may be more likely to detect new/progressive lesions before symptoms develop. Surgical salvage was uncommon with either schedule. Further study may identify a high-risk subgroup who would benefit from early surveillance.

SURGERY

SURG-01. MANAGEMENT OF SOLITARY BRAIN METASTASIS LESS THAN 4 CM IN DIAMETER. SURGICAL RESECTION VERSUS STEREOTACTIC RADIOTHERAPY: A META-ANALYSIS.

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INTRODUCTION: To treat a solitary metastasis in the brain, surgical resection and/or radiotherapy are the standard treatments of care. However, the clinical scenarios in which to use these techniques alone or in combination are controversial. While a course of stereotactic radiotherapy is often administered to a patient who presents with multiple metastases, surgical resection is often directed against a larger solitary brain metastasis before irradiating the resection bed. The management of a smaller solitary tumor (diameter less than 4 cm) is less clear. Accordingly, our meta-analysis assembled studies that focused on patients with a solitary tumor less than 4 cm in diameter. METHODS: Following PRISMA guidelines (PROSPERO ID: CRD42021242434), we searched PubMed, Web of Knowledge, and Cochrane Library databases for randomized controlled trials (RCT) and observational studies comparing surgery to radiotherapy for solitary metastatic brain tumors less than 4 cm in diameter. From 498 total records, we included 9 studies for meta-analysis. Analysis was performed on R. RESULTS: 2 RCTs and 7 observational studies were identified. 431 patients underwent surgical intervention, and 349 patients exclusively underwent radiotherapy. The surgical treatment cohort did not exhibit a difference in 1-year (OR [95% CI] = 0.866 [0.609–1.289]), 2-year (1.7 [0.843–3.428]), or overall survival (1.18 [0.598–2.327]). However, the surgical treatment group demonstrated greater local tumor recurrence after 1-year (3.975 [1.979–7.987]) and overall local recurrence (3.045 [1.276 - 7.268]). There was no difference between the overall rates of distant recurrence (0.565 [0.218 - 1.466]). CONCLUSIONS: Our analysis opens more discussion about the management of solitary brain metastasis. Patient selection is paramount in achieving better local control. Stereotactic radiotherapy should be considered for treatment of solitary brain metastasis less than 4 cm in diameter in selected patients. Future randomized control trials for small solitary masses are recommended.

SURG-02. STEREOTACTIC LASER ABLATION (SLA) FOLLOWED BY CONSOLIDATION STEREOTACTIC RADIOSURGERY (SRS) AS A TREATMENT STRATEGY FOR BRAIN METASTASIS THAT RECURRED LOCALLY AFTER INITIAL RADIOSURGERY (BMRS): A COLLABORATIVE INSTITUTIONAL EXPERIENCE

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INTRODUCTION: In independent clinical trials, ~30% of brain metastases recur locally after radiosurgery (BMRS). For these lesions, treatment with stereotactic laser ablation (SLA, also known as laser interstitial thermal therapy (LITT)) alone achieves a 12-month local control (LC^{12}) of 54–85% while repeat SRS achieved LC^{12} of 54–79%. Here, we report favorable outcomes for BMRS treated with SLA followed by consolidation radiosurgery (SLA/cSRS). METHODS: Clinical outcome of 18 patients with 19 histologically confirmed BMRS treated with SLA followed by consolidation SRS and >3 months follow-up were collected retrospectively across three institutions. Local control was defined as stability or decrease in contrast-enhancing (CE) and FLAIR volume. RESULTS: SLA achieved ablation of 73–100% of the BMRS CE volumes. Consolidation hypofractionated radiosurgery (5 Gy x 5 or 6 Gy x 5) was carried out 16–40 days post-SLA (median of 26 days). With a median follow-up of 185 days (range: 93–1367 days) and median overall survival (OS) of 185 days (range: 99–1367 days), 100% LC^{12} was achieved. 13/18 (72%) patients that required steroid therapy prior to SLA/cSRS were successfully weaned off steroid by three months post-SLA/cSRS. Post-SLA, KPS declined for 3/19 (16%) patients and improved for 1/19 (5%) patients. No KPS changes occurred subsequent to consolidation SRS. There were no 30-day mortalities or wound complications. Two patients required re-admission within 30 days of SRS (severe headache that resolved with steroid therapy (n=1) and new-onset seizure (n=1)). Except for two patients who suffered histologically confirmed, local failure at 649 and 899 days, all other patients are either alive (n=5) or died from systemic disease progression (n=11). None of the treated patients developed symptomatic radiation necrosis. CONCLUSIONS: This collaborative institutional experience support efficacy and safety of SLA followed by consolidation SRS as a treatment for BMRS. The treatment strategy warrants further investigations.

SURG-03. THE EFFECT OF SURGERY ON RADIATION NECROSIS IN IRRADIATED BRAIN METASTASES: EXTENT OF RESECTION AND LONG-TERM CLINICAL AND RADIOGRAPHIC OUTCOMES

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OBJECTIVE: Radiation therapy is a cornerstone of brain metastasis (BrM) management but carries the risk of radiation necrosis (RN), which can require resection for palliation or diagnosis. We sought to determine the relationship between extent of resection (EOR) of pathologically-confirmed RN and postoperative radiographic and symptomatic outcomes.