growth or radiation necrosis, these radiation modalities can fail. MR-guided laser interstitial thermal therapy (LITT) has emerged as an option for these tumors. Clinical data for five patients at our institution was retrospectively reviewed. These were all the patients that had undergone LITT for intracranial metastatic melanoma after prior treatment failure that included a radiation modality. Demographics, prior treatments, surgical data, perioperative complications, adjuvant treatments, and follow imaging data were gathered. Of the five patients, one patient had received WBRT, three patients had received prior SRS to the area that underwent LITT, and one patient had a prior craniotomy with adjuvant SRS. Two of the tumors were located in the premotor area (frontal lobe), two tumors were located in the motor strip, and one tumor was located in the cerebellum. The average tumor volume was 4.32 cc (range 1.86 - 7.84 cc). Median time of hospital stay was 2 days (with a 2.6 day average). No perioperative complications were encountered. Three of the patients had received adjuvant therapy at our institution; these patients were not delayed in receiving adjuvant therapy. Of these three patients, only one patient had a BRAF mutation detected. Four patients received follow up imaging at our institution, with no patients demonstrating tumor regrowth in the site of LITT. Regrowth of intracranial metastasis of malignant melanoma is a known possibility of traditional radiation therapies. LITT should be considered as a safe, effective option for those that fail these traditional therapies, especially those located in areas difficult to access. The low complication rate allows patients to restart adjuvant therapies.

SURG-06. LASER INTERSTITIAL THERMAL THERAPY COMPARED TO CRANIOTOMY FOR TREATMENT OF RADIATION NECROSIS OR RECURRENT TUMOR IN BRAIN METASTASES FAILING RADIOSURGERY

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Many publications report laser-interstitial thermal therapy (LITT) as a viable alternative treatment to craniotomy for radiation necrosis (RN) and re-growing tumor occurring after stereotactic radiosurgery (SRS) for brain metastases. No studies to-date have compared the two options. The aim of this study was to retrospectively compare outcomes after LITT versus craniotomy for regrowing lesions in patients previously treated with SRS for brain metastases. Data were collected from a single-institution chart review of patients treated with LITT or craniotomy for previously irradiated brain metastasis. Of 75 patients, 42 had recurrent tumor (56%) and 33 (44%) had RN. Of patients with tumor, 26 underwent craniotomy and 16 LITT. For RN, 15 had craniotomy and 18 LITT. There was no significant difference between LITT and craniotomy in ability to taper off steroids or neurological outcomes. Progression-free survival (PFS) and overall survival (OS) were similar for LITT versus craniotomy, respectively: %PFS-survival at 1-year = 72.2% versus 61.1%, %PFS-survival at 2-years = 60.0% versus 61.1%, p = 0.72; %OS-survival at 1-year = 69.0% versus 69.3%, %OS-survival at 2-years = 56.6% versus 49.5%, p = 0.90. This finding persisted on sub-analysis of smaller lesions under < 3cm in diameter. Craniotomy resulted in higher rates of pre-operative deficit improvement than LITT ($p < 0.01$). On sub-group analysis, the single factor most significantly associated with OS and PFS was pathology of the lesion. About 40% of tumor lesions needed post-operative salvage with radiation after both craniotomy and LITT. LITT was as efficacious as craniotomy in achieving local control of recurrent irradiated brain metastases and facilitating steroid taper, regardless of pathology. Craniotomy appears to be more advantageous for providing symptom relief in those with pre-operative symptoms.

SURG-07. CORRELATION BETWEEN VOLUMETRIC ANALYSIS AND CLINICAL OUTCOMES OF BRAIN METASTASES TREATED WITH LASER INTERSTITIAL THERMAL THERAPY (LITT)

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PURPOSE: Describe and analyze the volumetric responses of metastatic brain tumors treated with LITT and how changes correlate with local recurrence (LR). MATERIALS AND METHODS: Retrospective study with consecutive patients with progressive disease after SRS for brain metastasis. Spider and scatter plots and Locally Weighed Scatterplot Smoothing (LOWESS) for tumor and edema volume were created to analyze volume changes. Patients were compared using Chi-square tests and odds ratios (OR). RESULTS: 61 consecutive patients with 82 lesions (5 newly diagnosed, 46 recurrence and 31 radiation necrosis). Mean tumor volume was 4.84cm3, mean edema volume was 43.86cm3 and the mean ablation volume was 8.09cm3. LOWESS showed an initial increase in the first month, followed by steady decrease in the following months. Tumor edema shows a plateau or a slight increase in the first month, followed by a steady decrease in the subsequent months. Patients with LR showed an increase in the edema in the first 60 days, whereas tumor volume tended to remain stable, increasing in size after the third/fourth month. After 60 days, if edema volume is above baseline or increasing in size from nadir, there is an increased risk of LR (OR 4.22; 95% CI 1.5011.89,P=0.0053). Tumor volume above baseline ablation volume or increasing from a nadir on the first scan after day 60 had an increased risk of recurrence (OR 3.46; 95% CI 1.239.71,P=0.0016). If both edema and tumor volume are above baseline or increasing after day 60, there is also an increased risk of LR (OR 4.00; 95% CI 1.4111.36,P=0.0077). CONCLUSIONS: If either edema or tumor volume fail to fall below baseline or show an increasing trend on the first scan after day 60 post LITT, patients have an increased risk of LR. Qualitatively edema was the first feature observed in LR followed by increase in tumor volume.

SURG-08. GASTROINTESTINAL STROMAL TUMOR WITH INTRACRANIAL METASTASIS: CASE REPORT AND SYSTEMATIC REVIEW OF LITERATURE

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BACKGROUND: Intracranial metastasis of Gastrointestinal Stromal Tumors (GIST) is rare but presents unique treatment challenges. We present a case of intracranial metastasis of GIST with a systematic review of the literature regarding this rare clinical scenario. METHODS: A systematic review of the literature was performed to identify cases of intradural GIST metastases to the brain. Additionally, a patient case of GIST is discussed. RESULTS: Out of the 18 articles included for analysis in this review and our present case, fifteen of nineteen patients were male, and mean age was 58 years old (range 15–80 years, median 60 years). The primary site of the GIST along with site of intraperitoneal metastasis was variable. There was a large predilection for brain metastasis to the cerebrum with only one to infratentorial elements. The tumors in seven of the cases involved the dura, and there was one case with metastasis to the pituitary. Eight patients died following treatment of their intracranial disease. CONCLUSIONS: Surgery remains the mainstay of intracranial metastatic GIST, however there are many reports of good responses to radiation or chemotherapy alone. More investigation is required to determine the best course of treatment for patients with this unusual sequela of GIST.

SURG-09. SURGICAL AND PERI-OPERATIVE CONSIDERATIONS FOR BRAIN METASTASES: A NATIONWIDE ANALYSIS

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BACKGROUND: Brain metastases are the most frequent brain tumors in adults, whose management remains nuanced. We aim to improve risk stratification for brain metastases patients who might be candidates for surgical resection. METHODS: We conducted a nationwide, retrospective cohort analysis of adult patients who received craniotomy for resection of brain metastasis using the 2012–2015 American College of Surgeons National Surgical Quality Improvement Project databases. Our primary outcomes of interest were post-operative medical complications, reoperation, readmission, and mortality. RESULTS: 3500 cases were included, of which 17% were considered frail and 24% were infratentorial. The most common 30-day medical complications were pneumonia (4%), venous thromboembolism (VTE;3%), and urinary tract infections (2%). Cardiac events and cerebrovascular accidents tended to occur in the early post-operative period, while VTEs and infections occurred in a more delayed fashion. Reoperation and unplanned readmission occurred in 5% and 12% of patients, respectively. Infratentorial approach and frailty were associated with reoperation before discharge (OR 2.0 for both; p=0.01 and p=0.03 respectively), but not after discharge. Frail patients were especially at risk for surgical evacuation of hematoma (OR 3.6). Infratentorial approaches conferred heightened risk for readmission for hydrocephalus (OR 5.1, p=0.02) and reoperation for cerebrospinal fluid diversion (OR 7.1, p< 0.001). Overall 30-day mortality was 4%, with nearly three-quarters occurring after discharge. Pre-frailty and frailty were associated with increased odds for post-discharge mortality (OR 1.7 and 2.7, p< 0.05), but not pre-discharge mortality. We developed a model to predictors of death, which identified frailty, thrombocytopenia, and high American Society of Anesthesiologists score as the strongest predictors of 30-day mortality (AUROC 0.75). CONCLUSION: Optimization of metrics contributing to patient frailty and heightened surveillance in patients with infratentorial metastases may be considered in the peri-operative period.