ined our cohort of over 200 high-grade meningiomas. METHODS: We queried our hospital's EHR system for surgically resected meningiomas from January 2013 to December 2019. Of 286 results identified, 24 patients met the inclusion criteria: 1) histologically confirmed WHO grade II or III meningioma, 2) primary resection coupled with adjuvant radiation therapy, and 3) no chemotherapy. Only one WHO grade III meningioma met inclusion criteria. Patients with NF2 were excluded. Patient demographics, radiation dosage, fraction number, and dates of surgery, radiation onset, recurrence, and most recent follow-up were recorded. RESULTS: Median age at surgery was 56.2 years (± 11.1, range 37.8 – 81.7), and males comprised 70.8% (n = 17) of the population. Only FSRT or IMRT were employed. The most frequent dosage was 55.8 Gy across 31 fractions with a median time to radiation of 2.7 months (± 3.0, range 1.0 – 12.6). 5 out of 24 patients experienced recurrence, which did not include the WHO III tumor. Median time to recurrence was 3.0 years (± 2.0, range .3 – 5.8). Median follow up was 3.5 years (± 2.2, range .3 – 9.3). CONCLUSIONS: A fraction of our population experienced recurrence, regardless of grade II or grade III pathology. FSRT remains a safe and effective adjuvant therapy for high-grade meningioma after surgical resection. Future prospective studies comparing differing radiation modalities should be conducted.

RADT-39. 68GA- DOTATATE CT/PET FOR GAMMA KNIFE RADIOSURGERY PLANNING AND TARGET DELINEATION IN PATIENTS WITH MENINGIOMA

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BACKGROUND: Stereotactic radiosurgery (SRS) planning for patients with meningiomas can be confounded by difficulty in identifying the tumor boundary, especially in those who have had prior surgery. Recent data have suggested the benefit of 68Ga-DOTATATE CT/PET scans in delineation of meningioma compared to MRI alone. We propose that incorporating 68Ga-DOTATATE PET scans in addition to MRI in SRS planning will provide better target identification and tumor coverage compared to MRI alone. METHODS: We reviewed patients with meningioma who had MRI and 68Ga-DOTATATE PET imaging over 12 months. Images were imported into Velocity treatment planning software and separated into two different sessions, one in which only the MRI was accessible, and a second which had the PET scan fused to the MRI. Three different users were asked to contour the residual meningioma as gross tumor volume (GTV) first with MRI alone, and then with the PET/MRI fusion. The volume of each GTV pre-and post-PET fusion was compared and a Dice index was generated. RESULTS: Four patients with 6 GTV targets were identified. PET fusion identified new lesions close to the initial GTV targets in 2 patients. The first was a discontinuous dural lesion in the post-op bed. The second was a nodular dural lesion along the left high parietal convexity adjacent to a prior craniectomy and mesh duraplasty site. In the third patient, PET scan identified a greater extent of disease in the skull base. Across all observers, GTV volumes were significantly increased when PET fusion was used. The average volume (cc) increase was 111.6%±66.2%. The average Dice index was 0.58±0.17. CONCLUSION: 68Ga-DOTATATE PET scan fused with MRI improved the visualization of meningiomas in patients undergoing SRS. A larger experience is needed to confirm this trend. We have begun to use DOTATATE-PET imaging regularly when imaging patients with meningiomas for SRS.

RADT-40. TRENDS IN THE USE OF RADIATION FOR MENINGIOMA ACROSS THE UNITED STATES

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BACKGROUND: Meningiomas are tumors originating from arachnoid cap cells on the surface of the brain or spinal cord. Treatment differs by grade but can consist of surgery, radiation therapy or both. We utilized the national cancer database (NCDB) to compare trends in the use stereotactic radiosurgery (SRS) and external beam radiation therapy (EBRT) in the management of meningioma. METHODS: We queried the NCDB from 2004-15 for meningioma patients (Grade 1-3) treated with radiation therapy, either SRS or EBRT. Multivariable logistic regression was used to identify predictors of each treatment and to generate a propensity score. Propensity adjusted Kaplan-Meier survival curve analysis and multivariable cox hazards ratios were used to identify predictors of survival. RESULTS: We identified 5406 patients with meningioma meeting above criteria. Median follow up was 43 months. 45%, 44%, and 11% were Grade 1, 2, and 3, respectively. Predictors for SRS were distance from treatment facility and histology. Predictors of EBRT were tumor size and WHO grade 2 or 3 disease. Tumor size, treatment year, and receipt of chemotherapy were associated with improved survival. Five and ten year survival rates were 89.2% vs. 72.6% ($p < 0.0001$) and 80.3% vs. 61.4% ($p = 0.29$) for SRS and EBRT respectively. After propensity matching 226 pairs were generated. For SRS, 5 year survival was not significantly improved at 88.2% ($p = 0.056$) CONCLUSIONS: In the present analysis, predictors of SRS utilization in management of meningioma include distance from treatment facility and histology whereas conventional EBRT utilization was associated with tumor size and grade 2 or 3 disease. Despite a possible survival benefit with SRS, inherent selection bias may confound interpretation of the apparent survival benefit reflected in our study.

RADT-41. ASSESSING THE ROLE OF ADJUVANT RADIATION THERAPY AND RISK FACTORS FOR RECURRENCE FOLLOWING GROSS TOTAL RESECTION OF ATYPICAL MENINGIOMAS

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While meningiomas are commonly benign brain tumors, as many as 30% may be classified as atypical, or WHO Grade 2. Patients are at risk of recurrence following resection and often are prescribed adjuvant radiation therapy (RT)-although most data on this treatment is retrospective and has shown mixed RESULTS: In this study we assessed the influence of adjuvant RT following gross total resection (GTR) in patients with newly diagnosed atypical meningiomas at our institution and sought to determine predictors of tumor recurrence. All patients who underwent GTR (Simpson Grade I and II) at their index operation from 1994-2014 were retrospectively reviewed. Patients then either underwent observation or adjuvant RT (Intensity-Modulated Radiation Therapy (IMRT) or stereotactic radiosurgery (SRS)). A total of 145 patients had documented GTR at the time of initial resection, including 88 females (61%) and 57 males (39%), with a mean age of 58 +/- 15.7 years. 118 patients were followed with observation after surgery while 27 (18.6%) patients received adjuvant RT prior to known recurrence (IMRT for 15 patients (55.5%) and SRS in 12 patients (44.4%)). Patients receiving adjuvant RT had significantly larger tumors, as well as a higher incidence of spontaneous necrosis and small cell phenotype on histopathology. Overall 5-year PFS in our cohort was 71.6% (CI 60.6%-84.7%) and was unchanged by adjuvant RT ($p = 0.52$). 23 patients (15.8%) had a recurrence with a mean follow up of 42.9 months (17.1-53.5 months). Male gender (HR=1.02, p=0.019), tumor size (HR=1.17, p= 0.002) and MIB-1 > 4 (HR=8.50, p=0.04) were associated with increased recurrence risk. There was no association between radiation type (SRS vs. IMRT) and risk of recurrence (p= 0.154). In our patients, adjuvant RT following GTR of atypical meningiomas did not improve PFS. Risk factors for recurrence included male gender, larger tumor size, and MIB-1 > 4.

RADT-42. ADJUVANT RADIATION THERAPY FOR SUBTOTALLY RESECTED CEREBELLAR LIPONEUROCYTOMA

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INTRODUCTION: Classified as a benign glioneural tumor, cerebellar liponeurocytoma is a rare disease (fewer than 80 reported cases) and was upgraded from WHO grade I to grade II in 2007 due to its high recurrence rate. The authors report a case of definitive radiation therapy for recurrent subtotally resected cerebellar liponeurocytoma. METHODS: An 80-year-old man having undergone seven resections for his left cerebellar liponeurocytoma without adjuvant therapy over the previous decade at outside institutions was referred for radiation therapy two months following his eighth resection, where gross total resection was limited by the lesion proximity to his brainstem resulting in a 2 cm residual left cerebellar lesion. Pathology revealed tumor cells strongly positive for synaptophysin and a Ki-67 labeling index < 1%. Due to the propensity of this disease to recur following resection, his entire resection cavity was treated with external beam radiation therapy (EBRT) to 46 Gy, followed by a 10 Gy boost to his residual disease yielding a total of 56 Gy to the residual disease. RESULTS: Reimaging following the initial 46 Gy revealed the residual disease remained amenable (< 3 cm) to stereotactic radiosurgery (SRS), which was delivered via linear accelerator (10 Gy to the 80% isodose line) in a single fraction. Following EBRT + SRS, the patient responded well. At last follow-up, he has demonstrated no evidence of disease progression, brainstem-related morbidity or surgical incision-related morbidity. CONCLUSIONS: The first reported case of SRS treatment of cerebellar liponeurocytoma as the culmination of a coordinated definitive plan beginning with EBRT supports the applicability and feasibility of this treatment strategy following subtotal resection. This case indicates that a radiation treatment plan similar to that for central neurocytoma may be an optimal strategy, and suggests that adjuvant radiation therapy following operative resection of this rare disease may be underutilized.