adults who underwent subtotal PCA resection. Our findings provide a rationale for further investigation into the efficacy and safety of RT within this patient population.

RADT-30. COPLANAR AND NON-COPLANAR VMAT ARC SETTING FOR GLIOBLASTOMA MULTIFORME – DOSIMETRIC AND RADIOBIOLOGICAL COMPARISONS

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OBJECTIVES: To evaluate three different arc arrangements in glioblastoma multiforme (GBM) treatment planning. METHODS: Eighteen GBM patients were replanned by using one full arc (1FA), two full coplanar arcs (2FA), and three full non- coplanar arcs (3FA). Dose-volume histograms (DVHs) were used to calculate conformity (CI), homogeneity (HI) and gradient indices (GI), the dose received by 5% (D5%) and 95% (D95%) of the planning target volume (PTV) and maximum (Dmax) and minimum (Dmin) absorbed dose for organs at risk (OARs), including normal brain (brain excluding PTV). General equivalent uniform dose (gEUD) for both PTV and OARs and EUD based tumor control probability (TCP) and normal tissue control probability (NTCP) were calculated as radiobiological parameters. Monitor units (MUs) were also computed and compared. RESULTS: All three plans resulted in similar conformity, while 2FA resulted in a better homogeneity than 1FA (0.06*vs.* 0.07, *p=0.007*). 2FA vs. 1FA dose analysis for PTV revealed a lower D5% (61.28 vs. 61.37 Gy, *p=0.014*), a higher D95% (58.7 vs. 58.47 Gy, *p=0.008*) and a higher TCP (37.73 *vs.*37.38%, *p=0.008*). The utilization of 3FA did not significantly change the outcome of PTV but managed to decrease GI in comparison to both 1FA and 2FA (4.11 vs. 5.19 and 5.49, *p< 0.05*). Regarding NB, 1FA scored a higher Dmax than 2FA (62.32 *vs.* 61.98 Gy, *p=0.005*), while 3FA scored a higher Dmin than 1FA and 2FA (2.52 vs. 1.08 and 1.10 Gy, *p< 0.05*). No difference in NB NTCP was noted between techniques. Furthermore, 3FA yielded more MUs when compared to coplanar patters (566.74 *vs.* 486.78, *p= 0.015* for 1FA and 495.98, *p=0.019* for 2FA). CONCLUSION: Although all three approaches resulted in clinical admissible outcome, the utilization of complex non-coplanar arrangement resulted in a stepper dose fall off but did not improve PTV results and increased machine MUs.

RADT-31. PATTERNS OF CARE IN THE USE OF ADJUVANT RADIOTHERAPY AND CHEMOTHERAPY IN LOW GRADE GLIOMA PATIENTS IN THE UNITED STATES FROM 2010-2016

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PURPOSE: In 2016, RTOG 9802 reported an overall survival advantage with the addition of chemotherapy to adjuvant radiotherapy (CRT) in patients with high-risk low grade glioma (LGG). We used the National Cancer Database (NCDB) to measure trends in CRT use in LGG patients from 2010-2016, a period when no Level 1 evidence existed. METHODS: The NCDB was queried for WHO Grade II glioma patients treated from 2010-2016 who met the inclusion criteria for RTOG 9802. Adjusted logistic regression was used to assess the association of treatment year with the annual percentage of patients who received adjuvant CRT. Relative percent change and average annual percentage change (AAPC) were compared to determine if a change (defined a priori as < 0.01) occurred in the use of adjuvant CRT in LGG patients during this period. RESULTS: The analytic cohort consisted of 5,039 patients; 64.3% of patients were 40 years or older and 35.7% were under 40 with subtotal resection. Use of adjuvant CRT increased from 18.9% to 49.7% (p< 0.001) during 2013-2016, with no change observed before 2013. The AAPC in the use of CRT was +39.6% per year (p< 0.001). Corresponding declines in patients treated with surgery alone (p< 0.001) and surgery plus radiotherapy (p< 0.001) were observed during 2013-2016. Logistic regression demonstrated patients who were under 40 years old were significantly less likely to receive adjuvant CRT than patients 40 years or older (Odds Ratio 0.561, 95% CI 0.475-0.663, p< 0.001). Use of adjuvant CRT increased from 12.5% to 45.1% in patients with oligodendroglioma during 2013-2016 (p< 0.001). CONCLUSIONS: During 2013-2016, an increasing number of patients with LGG were treated with surgery followed by adjuvant CRT. Future studies may characterize the use of single agent vs. multiagent chemotherapy in this population and the adoption of trimodality therapy by mutation status.

RADT-32. NATIONAL TRENDS IN RADIATION DOSE FOR LOW GRADE GLIOMAS

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BACKGROUND: Adjuvant radiation is used in patients with low grade gliomas (LGG) with high risk characteristics. Randomized trials have examined dosing schemes ranging from as low as 45 Gy to higher than 60 Gy, with no difference in outcome. We used the National Cancer Database (NCDB) to see which doses were used in this patient population, and if any difference were seen in outcome. METHODS: We queried the NCDB for patients with WHO Grade 2 brain tumors treated with surgery and adjuvant radiotherapy. We divided the cohort into dose groups: 45-50 Gy, 50.4-54 Gy, and >54 Gy. Multivariable logistic regression was used to identify predictors of low and high dose radiation. Propensity matching was used to account for indication bias. RESULTS: We identified 1,437 patients meeting the above criteria. Median age was 45 years. Forty-eight percent had astrocytoma subtype and 70% had subtotal resection. The majority of patients (69%) were treated to between 50.4-54 Gy. Half of all patients were treated with radiation alone. 1p19q status was recorded in 32% of patients, and 13% overall were co-deleted. Predictors of high dose radiation were increased income, astrocytoma subtype, chemotherapy receipt, and treatment in 2014. Patients treated to a dose of >54 Gy had a median survival of 73.5 months and was not reached in those treated to a lower dose (p=0.0041). Subset analysis of patients with astrocytoma subtype showed median survivals of 79.0 and 51.2 months for low and high dose, respectively (p=0.13). When limited to oligodendrogliomas corresponding 5 year survival rates were 86% and 65%, in favor of lower doses (p=0.0004). CONCLUSIONS: This analysis shows that 50.4-54 Gy is the most widely used radiation regimen for ow grade gliomas. There appeared to be no benefit to higher doses, although factors not recorded are likely confounding the RESULTS:

RADT-33. RADIOSURGERY VERSUS COMBINATION RADIOSURGERY-BEVACIZUMAB FOR THE TREATMENT OF RECURRENT HIGH-GRADE GLIOMA: A SYSTEMATIC REVIEW

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BACKGROUND: High-grade gliomas (HGG) comprise the most common primary adult brain cancers and universally recur. Combination re-radiation therapy (reRT) and bevacizumab (BVZ) therapy for recurrent HGG is common, but its reported efficacy is mixed. OBJECTIVE: To assess clinical outcomes after reRT±BVZ in recurrent HGG patients receiving stereotactic radiosurgery (SRS), hypo-fractionated (HFSRT), or fully fractionated RT (FSRT). METHODS: We performed a systematic review of PubMed, Web of Science, Scopus, Embase, and Cochrane databases, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We identified studies reporting outcomes for patients with recurrent HGG treated via reRT±BVZ. Cohorts were stratified by BVZ treatment status and reRT modality (SRS, HFSRT, and FSRT). Outcome variables were overall survival (OS), and progression-free survival (PFS). RESULTS: 34 of 1,742 identified articles survived inclusion criteria (2%) and reported data on 954 patients receiving reRT alone and 445 patients receiving reRT+BVZ. All patients initially underwent standard-of-care therapy for their primary HGG. In a multivariate analysis that adjusted for median patient age, WHO Grade, RT dosing, reRT fractionation regimen, time between primary and reRT, and reRT target volume, BVZ therapy was associated with significantly improved OS (2.51 [0.11, 4.92] months, P=.041) but no significant improvement in PFS (1.40 [-0.36, 3.18] months, P=.099). Patients receiving BVZ also had significantly lower rates of RN (2.2% vs 9.5%, P < .001). CONCLUSIONS: Combination reRT+BVZ may improve OS and reduce rates of RN in recurrent HGG, but further controlled studies are needed to confirm these effects.

RADT-34. PREDICTIVE FACTORS FOR OVERALL SURVIVAL IN SURGICAL CASES OF GLIOMATOSIS CEREBRI FROM THE NATIONAL CANCER DATABASE

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Gliomatosis Cerebri (GC) is a rare, aggressive, diffusely infiltrating cerebral tumor. Prognostic indicators and management strategies are currently poorly characterized. The National Cancer Database was queried for pa-

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