12 months) and all three cases survived without relapse. In second cancer cases, all three cases were treated with 40.05 Gy per 15 fractions of radiation therapy (2 cases were treated with photon and one case with proton). However, all cases relapsed and two cases died of disease. CONCLUSION: Twelve Gy in 8 fractions cranio-spinal irradiation followed by 28.8 Gy (RBE) in 16 fractions of proton beam therapy is thought to be useful for the relapsed case. Re-irradiation for second cancer was disappointing and further study is warranted.

**RONC-05. PRESERVING VISION IN OPTIC PATHWAY GLIOMA AMONG PATIENTS WITHOUT NEUROFIBROMATOSIS TYPE 1**

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PURPOSE: Sporadic optic pathway/hypothalamic gliomas (OP/HGs) represent a unique entity within pediatric low-grade glioma. Despite favorable survival, the location makes treatment difficult and local progression debilitating. We conducted longitudinal assessment of visual acuity (VA) among patients treated in the modern era with chemotherapy (CT) or early radiotherapy (RT). METHODS: Clinical characteristics were abstracted for patients treated over a 15-year period (2000–2015) at a single institution. Comprehensive ophthalmologic data taken at three to six-month intervals was examined with age-appropriate VA metrics converted to LogMAR scale. Kaplan-Meir "blindness-free survival" (BFS) curves were calculated as time to bilateral functional blindness (i.e. LogMAR ≥ 0.8 in both eyes), stratified by treatment and compared using log-rank test. RESULTS: Thirty-six patients with median follow-up of 7.6 years (range: 2–17) were identified. Median age at diagnosis was 2.5 years (IQR: <1–5). Early RT was administered as initial therapy (n=6) or first-line salvage (n=5) in a total of eleven patients (31%) at a mean age of 12 years (range: 6–17). Twenty-five patients (69%) were maintained primarily on CT with a mean age at initiation of 2.4 years (range <1–8). Of these, five patients received RT after ≥2 systemic therapy regimens. In terms of visual preservation, five/eight-year BFS rates were 84%/59% and 100%/100%, for CT and early RT, respectively (p=0.046). CONCLUSIONS: In a contemporary cohort, early RT, defined as initial or 1st line salvage therapy for OP/HGs manifested in superior VA. Children undergoing CT are at highest risk of functional blindness following five years of treatment.

**RONC-06. VOLUMETRIC-MODULATED ARC WHOLE-BRAIN RADIOTHERAPY FOR THE PREVENTION OF PERMANENT ALOPECIA IN PEDIATRIC PATIENTS**

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Permanent alopecia is a grave late complication of multi-drug chemotherapy (CTx) plus cranial irradiation, reducing both patient self-esteem and quality of life in pediatric patients. We started to use craniospinal irradiation (CSI) using the volumetric-modulated arc whole-brain radiotherapy (VMAT-WBRT) in order to prevent permanent alopecia. We treated 5 pediatric patients with CSI using VMAT-WBRT, and report the initial clinical outcome. Five consecutive patients (4–11 years old) who received CSI using VMAT-WBRT from June 2015 to November 2018 were included into this study. One patient with embryonic carcinoma received radiotherapy (RT) with concurrent CTx; four patients with medulloblastoma (two patients with standard risk, and two patients with high risk) received RT followed by CTx. The prescribed doses of CSI were 23.4–35.2 Gy in 13–22 fractions, respectively. Optimization for VMAT-WBRT was performed to reduce doses to the hair follicles with keeping the dose coverage to the planning target volume. Although all patients experienced temporary alopecia, their hair fully recovered over the whole scalp within 8 months after finishing RT. One patient had disease progression after 6 months after completing CTx; this patient who was diagnosed as Group 3 subtype had diffuse meningeal dissemination confirmed with contrast enhanced spinal MRI before RT. The other four patients had no evidence of recurrence. Although CSI with VMAT-WBRT might be one of considerable options, more cases are needed to verify the efficacy to prevent permanent alopecia for pediatric patients who receive multi-drug CTx and cranial irradiation.

**RONC-08. SURVIVAL IMPACT OF POSTOPERATIVE RADIOTHERAPY TIMING IN PEDIATRIC AND YOUNG ADULT EPENDYMOMA**

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INTRODUCTION: Postoperative radiotherapy is commonly given for WHO Grade 2–3 intracranial ependymoma. Clinicians generally aim to begin radiotherapy ≤5 weeks following surgery, but the optimal timing remains uncertain. METHODS: The National Cancer Database was queried for patients (age ≤39 years) with localized WHO Grade 2–3 intracranial ependymoma treated with surgery and postoperative radiotherapy. Multivariable logistic regression was used to identify factors associated with delayed postoperative radiotherapy, defined as starting >8 weeks after surgery. Overall survival (OS) curves were plotted based on radiotherapy timing (≤5 weeks, 5–8 weeks, and >8 weeks after surgery) and compared by log-rank test. Multivariate analysis (MVA) was used to identify factors associated with OS. RESULTS: In the final analytic set of 1,043 patients, age ≥21 years (OR 2.07, 95% CI 1.56–2.74) and WHO Grade 2 tumors (OR 1.41, 95% CI 1.08–1.85) were significantly associated with delayed time to adjuvant radiotherapy. No difference in 3-year OS was observed in patients who initiated radiotherapy ≤5 weeks, 5–8 weeks, and >8 weeks after surgery (89.8% vs. 89.1% vs. 88.4%; p= 0.796). On MVA, anaplastic histology (HR 2.414, 95% CI 1.784–3.268, p<0.001) and subtotal resection (HR 2.398, 95% CI 1.519–3.788, p<0.001) were significantly associated with reduced OS. Timing of radiotherapy, total radiotherapy dose, age, insurance status, and other factors were not significant. CONCLUSION: Delayed postoperative radiotherapy was not associated with inferior survival in patients with intracranial ependymoma, suggesting delayed radiotherapy initiation may be considered in patients requiring longer postoperative recovery or referral to an appropriate radiotherapy center.

**RONC-09. PSEUDOPROGRESSION AFTER PROTON THERAPY OF PEDIATRIC SPINAL PILOCYTIC ASTROCYTOMA AND MYXOPAPILLARY EPENDYMOMA**

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BACKGROUND: Pseudoprogression after proton therapy of CNS tumors is a challenging clinical situation. The rate of pseudoprogression after proton therapy of pediatric spinal tumors is unknown. METHODS: Records of pediatric patients with spinal pilocytic astrocytoma (sPA; n = 9) or myxopapillary ependymoma (MPE; n = 6) with gross disease treated with proton therapy with at least 6 months of follow up from completion of proton therapy were retrospectively reviewed for demographics, treatment characteristics, and occurrence of pseudoprogression. Pseudoprogression was defined as a post-radiation increase in tumor size with subsequent decrease in size without additional tumor-directed therapy. RESULTS: The median age at radiation for sPA patients was 10.1y (range, 7.0 – 16.2y) and 12.7y (range, 7.9 – 14.4y) for MPE patients. The median prescribed dose was 45 GyRBE (range, 39.6 – 50.4 GyRBE) for sPA patients and 50.4 GyRBE (range, 45 – 54 GyRBE) for MPE patients. One sPA patient received concurrent vincristine. Median follow up after proton therapy was 44 months (range, 9 – 99 months). Six of nine sPA patients (67%) had pseudoprogression occurring at a median of 81 days (range, 34 – 136 days) after proton therapy; no MPE patients developed pseudoprogression (0%; p < 0.03). Two sPA patients with pseudoprogression were symptomatic and improved with medical therapy. CONCLUSION: Preliminary analysis suggests that pseudoprogression occurs frequently within 6 months after proton therapy for sPA and infrequently after proton therapy for MPE.

**RONC-12. TREATMENT AGE AND NEUROCOGNITIVE OUTCOMES FOLLOWING PROTON BEAM RADIOTHERAPY FOR PEDIATRIC LOW GRADE GLIOMA**

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INTRODUCTION: Younger age at radiotherapy increases cognitive risk for patients with pediatric low grade glioma (LGG). We examined the impact of age at treatment on cognitive trajectories in LGG patients treated with proton radiotherapy (PRT) compared to patients treated without radiotherapy (surgery only; SO). METHODS: We examined cognitive