tumors. The presence of metastatic seeding is rare and has been reported as an adverse prognostic factor. We present 2 cases of young children with recurrent metastatic DIA/DIRG to describe their presentation, therapeutic management and outcome and to highlight the importance of molecular characterization of these rare tumors to guide adjuvant therapy. CASES DE-SCRIPTION: The first patient developed metastatic recurrence after initial gross total resection (GTR) of a localized DIA. The disseminated relapse was treated with a monthly carboplatin and vincristine (CBV) regimen. The complete response was achieved after 15 cycles and the patient has remained in continuous complete remission for 5 years. Post hoc molecular analysis of the tumor revealed a BRAF-RDX fusion. The second patient presented with a disseminated intraventricular spread following an incomplete resec- tion in a DIA associated with a SPECCL1-NTRK2 fusion. The patient re- ceived 2 cycles of CBV/CR with minimal response and was then switched to Larotrectinib leading to a very good partial response (VGPR) 3 months into therapy and has remained on treatment since then with significant clinical improvement. DISCUSSION/ CONCLUSION: In our 2 cases of recurrent DIA re- currence was responsive to adjuvant therapy leading to complete response with conventional chemotherapy in the first one and to VGPR with NTRK inhibitor in the second patient. Early molecular characterization of these be- havioral tumors is critical in case of incomplete resection or metastatic seeding leading to the development of potential treatments. Response with NTRK inhibitor appears rapid and significant but the total duration of treat- ment and sustainability of response after discontinuation remain unknown.

RARE-20. RETROSPECTIVE ANALYSIS OF 9 PINEOBLASTOMA Kevin Ai, Juan Li, Mingyao Lai, Linbo Cai; Guangdong Sanju Brain Hospital, Guangzhou, Guangdong, China

BACKGROUND: Pineoblastomas (PBs) are rare, supratentorial, primitive neuroectodermal tumors. Little is known about the clinical features and outcomes for PBs in pediatric patients. We retrospectively reviewed the clinical features of PBs with PBs who were treated in Guangdong Sanju Brain Hospital between December 2006 to May 2020. RESULTS: A total of 9 patients (7 males and 2 females) with PBs were treated in our hospital with a median age of 9 years (range: 2-16 years). Total or near-total resection was achieved in 3 patients (33%), partial resection in 4 (44.4%), and biopsy in 2 (22.2%). There were 4 patients with spinal cord compression at diagnosis. Five pa- tients received craniospinal irradiation (CSI), with concurrent or adjuvant chemotherapy. The average total dose of CSI was 3480±261cGy, and the average dose to local tumor bed was 56.08±6.41Gy. Two patients younger than 3 years old only received chemotherapies, while 1 patient did not receive any postoperative treatment, and 1 patient was unknown. The median fol- low-up time is 7 months (range: 3-39 months). At the last follow-up, 3 patients were died, 3 patients were survived, and 1 was lost to follow-up. The median OS was 31 months (95% CI: 1.782-60.281). Disease progression occurred in 3 patients during the follow-up period, and the median PFS was 19 months. CONCLUSION: Pineoblastoma is a rare central nervous system malignancy with a tendency for disseminated disease. Complementary ther- apies such as surgical resection, radiation and chemo therapy are effective therapies for PBs.

RARE-21. SOX2 PLAYS AN IMPORTANT ROLE IN CHOROID PLEXUS TUMOR DEVELOPMENT Lukas Palming, Tamanna Sarowar, James Virga, Navleen Singh, Brighdny Kwe, Haesun Zhao; New York Institute of Technology College of Osteopathic Medicine, Old Westbury, New York, USA

Choroid plexus (CP) tumors are rare primary brain neoplasms found most commonly in children and are thought to arise from CP epithelial cells. Sox2 is a transcription factor that not only plays a role in the development in the ventricular zone, CP, and roof plate, but also contributes to cancer stemness, tumorigenesis, and drug resistance. Gene expression studies demonstrate aberrant Sox2 express- ion in human CP tumors, suggesting a role in tumor development. A subset of CP tumors exhibit abnormal NOTCH pathway activity. Using animal models, we previously showed that sustained NOTCH activity leads to CP tumors. Immunofluorescence, RT-qPCR, and RNA scope assays have revealed increased Sox2 mRNA and protein expression in NOTCH-driven CP tumors compared to wild type CP. To investigate the role of Sox2 in CP tumors, we eliminated Sox2 expression in NOTCH-driven CP tumors. Loss of Sox2 almost completely blocked NOTCH- driven CP tumor growth in these mice, supporting a role for Sox2 in these tumors. Ciliogenesis regulation is one proposed functional pathway for tumor- genesis in CP tumors. Using immunofluorescence assays for cilia (ACIAR136) and aquaporin transport protein 1 (AQPI) in combination with super reso- lution microscopy, we observe a stark contrast between wild type CP epithelial cells whose multiciliated and radial cilia forming AQPI1, indicative of normal epithelial differentiation, compared to NOTCH-driven CP tumors con- sisting of monolayered cells with loss of AQPI1 expression. In Sox2-deficient NOTCH-driven CP tumors, we observe tumor cells remain mono-ciliated and AQPI1-negative, indicating that Sox2 loss does not affect the cilia machinery. Together this warrants further study into the mechanisms of Sox2 functions in CP tumors. By unraveling the role of Sox2 in CP tumors, we may better under- stand their origin and biology to ultimately design improved treatment options.

RARE-22. CHARACTERIZING THE LANDSCAPE OF STRUCTURAL VARIANTS IN ADAMANTINOMATOUS CRANIOPHARYNGIOMA Danny Jomaa1,2, Prasuddha Khadka1,2, Dana Novkov1,2, Alexandra D. Condurache1, Jessica W. Isaac1, Frank Dubose2, Shu Zhang2, Kevin Zhou2, Rose Goldel1, Cecilia Sousa2, Iane Vogelzang2, Eric Prince4, Sophie Lu4, Veronika Silovoz4, Georg W. Otto2, Sergio Castellano Hereza2, David Ashley7, Aaron A. Cohen-Gadol8, Eric Thompson9, Rameen Beresoukh12, John Apps12, Juan Pedro Martinez-Barbera12, Todd Heed12 with a disseminated intraventricular spread following an incomplete resec- tion in a DIA associated with a SPECCL1-NTRK2 fusion. The patient re- ceived 2 cycles of CBV/CR with minimal response and was then switched to Larotrectinib leading to a very good partial response (VGPR) 3 months into therapy and has remained on treatment since then with significant clinical improvement. DISCUSSION/ CONCLUSION: In our 2 cases of recurrent DIA re- currence was responsive to adjuvant therapy leading to complete response with conventional chemotherapy in the first one and to VGPR with CEM

INTRODUCTION: Adamantinomatous craniopharyngioma (ACP) is a rare brain tumor that primarily occurs in children and impact long-term morbidity and mortality. The molecular driver mutations that occur in ACPs are not well understood. The lack of high-quality genomic data on ACPs limits the potential of precision medicine for these tumors. To address this gap, we comprehensively investigated ACP tumor genomes and identified putative novel gene fusion drivers using a combination of advanced techniques. METHODS: ACP tumor samples from adult and pediatric patients from the University of Washington, Department of Neurosurgery, were studied. DNA was extracted from tumor tissue and subjected to comprehensive targeted gene sequencing with a custom panel designed to interrogate all known ACP driver genes. RESULTS: TUMOR DEVELOPMENT RARE-21. PRESERVATION OF ENDOCRINE FUNCTION AFTER OMMAYA RESERVOIR INSERTION IN CHILDREN WITH CYSTIC CRANIOPHARYNGIOMA Laura-Nanna Lohkamp, Abhaya V Kulkarni, James Drake, James T Rutka, Jill Hamilton, Ute K Bartels; The Hospital for Sick Children, Toronto, Ontario, Canada

INTRODUCTION: Children with craniopharyngiomas (CP) can be subject- ed to significant morbidities caused by radical surgery and/or radiation with deleterious long-term consequences. Ommaya reservoir insertion (ORI) into cystic CP represents a minimally invasive procedure allowing immediate decompression and aims to avoid additional injuries. The purpose of this study was to determine the relevance of upfront ORI (+/- intracystic treat- ment) for preservation of endocrine function. METHODS: We performed a retrospective cohort review of children with CP treated at the Hospital for Sick Children between 01/01/2000 and 15/01/2020 for review of endocrinological outcome after ORI. Endocrine function was reviewed at the time of initial surgery and throughout the course of follow-up. Event-free survival (EFS) was defined as the time to further surgical resection or irradiation. RESULTS: Seventy-nine patients were identified with a median age of 8.3 (range 2.1-18.0) years, 31 were males. Sixty-six patients underwent surgical treatment, including 41 ORI. ORI was performed as upfront treatment in 32 patients. 33 patients underwent total or near-total or 1 patient had second course as first treatment. Fifty-five of 79 patients had sufficient endo- crine follow-up data. Endocrine function remained stable after ORI with an mean of EFS of 27.64 (± 5.22) months. Surgical resection was associated with worsened endocrine function postoperatively with an EFS of 5.48 (± 1.74) months (p<0.001). CONCLUSIONS: Upfront ORI (+/- intracystic treat- ment) plays an important role in choroid plexus tumor development. Sox2 is a transcription factor that not only plays a role in the development in the ventricular zone, CP, and roof plate, but also contributes to cancer stemness, tumorigenesis, and drug resistance. Gene expression studies demonstrate aberrant Sox2 expression in human CP tumors, suggesting a role in tumor development. A subset of CP tumors exhibit abnormal NOTCH pathway activity. Using animal models, we previously showed that sustained NOTCH activity leads to CP tumors. Immunofluorescence, RT-qPCR, and RNA scope assays have revealed increased Sox2 mRNA and protein expression in NOTCH-driven CP tumors compared to wild type CP. To investigate the role of Sox2 in CP tumors, we eliminated Sox2 expression in NOTCH-driven CP tumors. Loss of Sox2 almost completely blocked NOTCH- driven CP tumor growth in these mice, supporting a role for Sox2 in these tumors. Ciliation regulation is one proposed functional pathway for tumor- genesis in CP tumors. Using immunofluorescence assays for cilia (ACIAR136) and aquaporin transport protein 1 (AQPI) in combination with super reso- lution microscopy, we observe a stark contrast between wild type CP epithelial cells whose multiciliated and radial cilia forming AQPI1, indicative of normal epithelial differentiation, compared to NOTCH-driven CP tumors con- sisting of monolayered cells with loss of AQPI1 expression. In Sox2-deficient NOTCH-driven CP tumors, we observe tumor cells remain mono-ciliated and AQPI1-negative, indicating that Sox2 loss does not affect the cilia machinery. Together this warrants further study into the mechanisms of Sox2 functions in CP tumors. By unraveling the role of Sox2 in CP tumors, we may better under- stand their origin and biology to ultimately design improved treatment options.