by LIN28A expression and alterations in the *C19MC* locus. ETMRs predominantly occur in young children, have a dismal prognosis, and no definitive treatment guidelines have been established. We report on our experience in nine consecutive patients. METHODS: Between 2006 and 2017, nine patients were diagnosed with ETMR. Median age was 25 months (5–38), seven were treated for primary diagnosis, two referred with progressing tumors, seven diagnosed prospectively, two retrospectively, five were located supratentorially, three pineal, one in the brainstem. RESULTS: Seven patients had a gross total resection, one a partial resection and one a biopsy at initial diagnosis, followed by second resections at progression. Six patients were treated with intensive chemotherapy regimens including high-dose chemotherapy in three patients and all recurred after a median of 6 months (range 2–11) and all except one patient who died after high-dose chemotherapy, succumbed to their disease after a median of 13 months (range 7–28). Two patients were treated with gross total tumor resection, early focal radiotherapy and concomitant temozolomide followed by temozolomide and intrathecal therapy for one year and both are in continuous complete remission 51 and 46 months after diagnosis. CONCLUSION: Gross total resection followed by early focal radiotherapy, temozolomide, and intrathecal chemotherapy seem to be superior to intensive chemotherapy including high-dose chemotherapy. Steady progression was observed in both patients with initial biopsy and PR only despite intensive therapy. Radiotherapy at recurrence/progression was not successful.

ETMR-11. A CASE OF PRIMARY DIFFUSE LEPTOMENINGEAL PRIMITIVE NEUROECTODERMAL TUMOR

Masahiro Sugawa[1], Keita Terashima[1], Yukihiro Matsukawa[1], Takanori Mizuno[1], Kyohei Isshiki[1], Shinichi Tsujimoto[1], Meri Uchiyama[1], Kenichi Sakamoto[1], Yoshihiro Gocho[1], Tomoo Osumi[1], Yoko Shioda[1], Chikako Kiyotani[1], Motohiro Kato[1], Daisuke Tomizawa[1], Kenichi Usami[2], Hideki Ogiwara[2], Yoshiaki Tsutsumi[3], Masayuki Nakano[4], Takako Yoshioka[4], and Kimikazu Matsumoto[1]; [1]Children's Cancer Center, National Center for Child Health and Development, Tokyo, Japan, [2]Department of Neurosurgery, National Center for Child Health and Development, Tokyo, Japan, [3]Department of Radiology, National Center for Child Health and Development, Tokyo, Japan, [4]Department of Pathology, National Center for Child Health and Development, Tokyo, Japan

BACKGROUND: Primary diffuse leptomeningeal primitive neuroectodermal tumor (PDL PNET) is a rare embryonal brain tumor which arises primarily in the meninges without an intraparenchymal mass. Few previous reports of this condition exist, and the clinical outcomes are poor. We herein report a case of a child with PDL PNET and present a cursory review of the literature. CASE: A 3-year-old female patient was seen at a local clinic due to vomiting, headaches, and seizures. As a head MRI revealed hydrocephalus but no mass, acute encephalopathy was initially diagnosed. She received steroid pulse therapy, but the symptoms progressed to hallucination and lethargy. Another MRI at the 1-month follow-up revealed diffuse leptomeningeal enhancement. Thereafter she was transferred to our hospital. A spine MRI revealed spinal dissemination. She underwent a dura mater biopsy, and the pathological analysis led to the diagnosis of PDL PNET. She received chemotherapy consisting of vincristine, cyclophosphamide, etoposide, cisplatin, and intrathecal methotrexate injections two months after the initial presentation. The progressive hydrocephalus was managed with external ventricular drainage. Two weeks after the first cycle of chemotherapy the hydrocephalus resolved, and the external ventricular drainage was removed. A follow-up MRI showed that the leptomeningeal enhancement decreased during the four cycles of chemotherapy without radiotherapy. The patient is scheduled to receive high-dose chemotherapy as consolidation therapy. CONCLUSION: PDL PNET is extremely rare, and its diagnosis is often delayed. Treatment of PDL PNET is very difficult due to its aggressive course, and surgical resection is impossible. Early diagnosis may help improve outcomes.

ETMR-12. EMBRYONAL TUMOR WITH MULTILAYERED ROSETTES: A SINGLE CENTER EXPERIENCE

Sodai Yoshimura[1], Masahiro Sugawa[2], Kohei Fukuoka[2], Makiko Mori[2], Yuki Arakawa[2], Masao Kobayashi[3,4], Yutaka Tanami[3], Atsuko Nakazawa[5], Katsuyoshi Koh[2], and Jun Kurihara[1]; [1]Department of Neurosurgery, Saitama Children's Medical Center, Saitama, Japan, [2]Department of Hematology/Oncology, Saitama Children's Medical Center, Saitama, Japan, [3]Department of Radiology, Saitama Children's Medical Center, Saitama, Japan, [4]Department of Radiology, Jikei University school of Medicine, Tokyo, Japan, [5]Department of Clinical Research, Saitama Children's Medical Center, Saitama, Japan

BACKGROUND: Embryonal tumor with multilayered rosettes (ETMR) is a rare, highly malignant tumor of the central nervous system and is usually diagnosed in children aged <2 years. Currently, because no defined treatment strategy has been reported, treatment regimens are often extrapolated from other embryonal tumors. Therefore, data collection of ETMR cases is important for further understanding EMTR. Here, we present our experience with four patients with ETMR. MATERIAL AND METHODS: Patients with a pathological diagnosis of ETMR from 1999 to 2016 at Saitama Children's Medical Center were included. Their clinical data were retrospectively analyzed. RESULTS: This study included four cases of ETMR (one male and three females). The mean age at diagnosis was 29.5 (range, 15–37) months. Presenting symptoms included seizure, hemiparesis, vomiting, and headache. The mean maximal tumor diameter was 42.5 mm. The tumor locations included frontal lobe, temporal lobe, occipital lobe, cerebellum, and brainstem. Gross total resection was achieved in two cases. Fluorescence in situ hybridization analysis demonstrated amplification of 19q13.42 chromosome region in all cases, and diffuse positive expression was observed in the immunohistochemical staining for LIN28A. Systemic postoperative chemotherapy was administered to all patients. Three patients received intrathecal therapy and three were irradiated. The mean overall survival and progression-free survival were 45.3 and 42 months, respectively. Two patients who underwent gross total resection are alive without recurrence. CONCLUSION: Complete surgical resection may be an important prognostic factor in patients with ETMR. Further prospective studies are needed to confirm these results.

ETMR-13. NFI GENES IN ETMR TUMORIGENESIS AND NEURODEVELOPMENT

Jens Bunt[1,2], Sander Lambo[3,4], Jonathan Lim[2], Monika Mauermann[3,4], Stefan Pfister[3,4], Linda Richards[2], Marcel Kool[1,3]; [1]Princess Máxima Center for Pediatric Oncology, Utrecht, Netherlands, [2]Queensland Brain Institute, University of Queensland, Brisbane, QLD, Australia, [3]Hopp Children's Cancer Center (KiTZ), Heidelberg, Germany, [4]Division of Pediatric Neurooncology, German Cancer Research Center (DKFZ), Heidelberg, Germany

Embryonal tumors with multilayered rosettes (ETMRs) are aggressive pediatric embryonal brain tumors with a universally poor prognosis. These tumors are commonly characterized by amplification of *C19MC*, but other miRNA-related aberrations, such as *DICER* mutations or *MIR17HG* amplifications, are also observed. Nevertheless, it remains unknown how these aberrations are driving the tumorigenesis. We applied miRNA target prediction to investigate the downstream targets shared by these aberrations affecting normal brain development and tumorigenesis. The nuclear factor one (*NFI*) family of transcription factors were found to be top candidates shared by both miRNA clusters. These genes are expressed at very low levels in ETMRs, in contrast to other brain tumors. During normal brain development these genes are expressed in radial glial progenitors and are required for the transition of proliferation to differentiation. Since radial glial progenitors are the potential cell-of-origin of ETMRs, we hypothesize that downregulation of NFI is required for the proliferative, undifferentiated state of ETMRs. Indeed, mouse models with deletion of an *Nfi* family member display sustained proliferation and delayed differentiation of radial glial progenitors during development. This leads into brain overgrowth, which has also been observed in humans with intellectual disabilities caused by *NFI* haploinsufficiency. When multiple *Nfi* family members are simultaneously targeted in mice, the progenitors are retained and both neurogenesis and gliogenesis are inhibited, resulting in a neuropathology similar to that of human ETMR tumors. Hence, downregulation of *NFI* genes resulting from miRNA aberrations could contribute to the developmental state and possibly tumorigenesis of ETMRs.

ETMR-14. TREATMENT OF EMBRYONAL TUMOURS WITH MULTILAYERED ROSETTES (ETMR) WITH CARBOPLATIN-ETOPOSIDE INDUCTION AND TANDEM HIGH-DOSE CHEMOTHERAPY WITHIN THE PROSPECTIVE HIT-TRIALS AND REGISTRIES

Björn-Ole Juhnke[1], Marco Gessi[2], Nicolas Ulrich Gerber[3], Carsten Friedrich[4], Christine Haberler[5], Martin Mynarek[1], Brigitte Bison[6], Rolf-Dieter Kortmann[7], Monika Warmuth-Metz[6], Ulrich Schüller[8], Stefan Michael Pfister[9,10], Torsten Pietsch[11], Marcel Kool[9,10], Stefan Rutkowski[1], Katja von Hoff[12]

[1]Clinic for Paediatric Haematology and Oncology, University Medical Centre Hamburg-Eppendorf, Hamburg, Germany, [2]Neuropathology Unit, Division of Pathology, Fondazione Policlinico Universitario "A Gemelli" IRCCS, Catholic University, Rome, Italy, [3]University Children's Hospital Zürich, Zürich, Switzerland, [4]Children's Clinic, University Medical Centre Rostock, Rostock, Germany, [5]Division of Neuropathology and Neurochemistry, Department of Neurology, Medical University of Vienna, Wien, Austria, [6]Institute for Diagnostic and Interventional Neuroradiology, University Hospital Würzburg, Würzburg, Germany, [7]Clinic for Radiotherapy, Leipzig University Medicine, Leipzig, Germany, [8]Institute of Neuropathology, University Medical Centre Hamburg-Eppendorf, Hamburg, Germany, [9]Department of Pediatric Hematology and