cial location, and may indicate a better prognosis compared to non-HGNET-MJ CNS tumors with astroblastic features.

OS6.2 MEDULLOBLASTOMA RECURRENCE: IMPROVED SURVIVAL WITH A METRONOMIC AND TARGETED ANTIANGIOGENESIS THERAPY - EXPERIENCE IN 18 PATIENTS

I. Slavc1, A. Peyrl1, A. A. Azizi1, J. Gojo1, M. Chocholous2, T. Čechl2, K. Dieckmann3, C. Haberer3

1Department of Pediatrics, Medical University of Vienna, Vienna, Austria, 2Department of Neurosurgery, Medical University of Vienna, Vienna, Austria, 3Department of Radiotherapy, Medical University of Vienna, Vienna, Austria

INTRODUCTION: Patients with recurrent medulloblastoma have a poor prognosis with approximately 8% surviving more than 5 years irrespective of salvage therapy used. An evolving alternative approach to conventional first-line chemotherapy is to target tumor angiogenesis at various levels, we report on 18 patients treated with an antiangiogenic combination therapy at the Medical University of Vienna. PATIENTS AND METHODS: From 11/2006 to 10/2015, 18 patients were diagnosed with a recurrent medulloblastoma (12 first, 6 multiple recurrences). Subgroup of medulloblastoma was group 3 or 4 in 13 patients, WNT in one patient, SHH infant in one, and not known in three. Median age at primary diagnosis was 7 years (range 0.5–12) and at start of antiangiogenic therapy of their recurrent relapse consisted of an antiangiogenic multidrug-regime including IV bevacizumab, oral thalidomide, celecoxib, fenofibrate, and etoposide alternating with cyclophosphamide, and augmented with intraventricular therapy (etoposide and liposomal cytarabine).

RESULTS: As of 03/2016, 11/18 patients are alive at a median of 20 (4 to 120) months after their last recurrence. 7/11 surviving patients are currently in CR 89, 86, 85, 59, 20, 18, 15, 15, 10, 11, and 4 months after their last recurrence as of their latest therapy for 69, 52, 50, 27, 6, and 5 months. Three are in partial remission after 4 to 10 months and one has progressive disease 15 months after his last recurrence. Six patients died of tumor progression 63, 27, 10, 6, 4, and 3 months after their last recurrence. One patient died of an accident without signs of tumor progression 23 months after initiation of antiangiogenic therapy. OS was 76 ± 11% after 1 and 2 years and 63 ± 15% at 5 years.

CONCLUSION: Our results suggest that an antiangiogenic metronomic strategy is superior to conventional and high-dose chemotherapy for recurrent medulloblastoma. An international formal phase II study is currently recruiting patients (MEMMAT; ClinicalTrials.gov Identifier: NCT01356290).

OS6.3 RADIOSURGERY FOR VASCULAR AND TUMORAL BRAIN LESIONS IN CHILDREN

D. Devriendt1, C. Remer2, N. Massager1

1Institut Jules Bordet, Brussels, Belgium, 2Gamma Knife center of ULB, Brussels, Belgium

PURPOSE: The objective of the present study is to assess the long-term safety and efficiency of Gamma Knife radiosurgical treatment of brain arteriovenous malformations and tumors in children.

METHODS: We reviewed the outcome of a series of 55 children (aged 2.4–15.5 years) who underwent radiosurgical irradiation for a tumor or vascular brain lesion in our center. This included 21 arteriovenous malformations, 1 cavernoma, 8 pilocytic astrocytoma, 4 grade II glioma, 1 globlastoma, 3 ependymoma, 3 hypothalamic hamartoma, 8 schwannoma, 2 meningioma, 2 choroid plexus carcinoma, 1 craniopharyngioma, and 1 hemangiopericytoma. All patients had single-session radiosurgery using Gamma Knife C or Perfexion, under general anesthesia for 39 patients. Pathologies with a mean size of 2.8 cc (range 0.1–13.6 cc) were irradiated with a mean margin dose of 16.8 Gy (range 10–25 Gy).

RESULTS: The follow-up period of 45 of these patients ranged from 0.5 to 12 years (mean 4.6 years). The obliteration rate of arteriovenous malformations was 86.6%. No bleeding occurred after radiosurgery. The morbidity was limited to 2 children: 1 patient with AVM had seizures after irradiation and 1 patient with vestibular schwannoma from NF2 lost hearing unilaterally. We observed excellent tumor control for patients with pilocytic astrocytoma, grade II glioma, schwannoma and meningioma, hemangiopericytoma. None of our children with globlastoma, ependymoma, hypothalamic hamartoma, or craniopharyngioma had their tumor controlled in the long term after radiosurgery.

OS6.4 MOLECULAR CLASSIFICATION OF MENINGIOMAS ACROSS ALL HISTOLOGICAL SUBTYPES AND GRADES

E. Sahm1,2, D. T. W. Jones3, M. Mittelbronn4, M. Weller5, W. Paulus5, W. Wöllner6, A. Unterberg1, C. Herold-Mende1, S. M. Pfister4, A. von Deimling1,2

1University Hospital Heidelberg, Neurology, Heidelberg, Germany, 2German Cancer Research Center, Heidelberg, Germany, 3University Hospital Frankfurt, Neuroradiology, Frankfurt, Germany, 4University Hospital Zurich, Neurology, Zurich, Switzerland, 5University Hospital Münster, Neurology, Münster, Germany, 6University Hospital Heidelberg, Neurology, Heidelberg, Germany, 7University Hospital Heidelberg, Heidelberg, Germany.

The current WHO classification recognizes 15 subtypes of meningioma distributed across three grades of malignancy. Allocation to subtype is based on histological findings. For other brain tumors, molecular profiling has already identified novel subsets beyond histological definitions. Here, we set out to identify novel clinically relevant subgroups of meningioma and reliable molecular markers by methylation and mutational profiling of 416 samples across all subtypes.

Unsupervised clustering of methylation data from 4350 array on 158 meningiomas (Discovery cohort) revealed six epigenetic subgroups. All cases were subsequently analyzed by targeted re-sequencing of a panel of genes. Selected cases of each group were subjected to exome-sequencing. The most prominent epigenetic difference was found between a cluster encompassing the majority of grade III cases (“ANAP” cluster) and the remaining grade II and grade I samples. This subgroup contained 13 cases of recurrent epithelium, consisting of an antiangiogenic multidrug-regime including IV bevacizumab, oral thalidomide, celecoxib, fenofibrate, and etoposide alternating with cyclophosphamide, and augmented with intraventricular therapy (etoposide and liposomal cytarabine).

Importantly, these subgroups were associated with distinct clinical behavior. Stratification based on these subgroups allowed for more accurate prognosis than grading according to the WHO classification.

Collectively, these data identify stable genetic subgroups among meningiomas, providing the basis for a refinement of meningioma classification with molecular markers.

OS6.5 THE PROGNOSTIC USABILITY OF GA68-DOTA-TATE PET-CT IN IRRADIATED MENINGIOMA

M. J. Pelak1, A. A. D’Amico2, K. M. Pecka2

1Maria Skłodowska-Curie Memorial Cancer Center and Institute of Oncology, Gliwice Branch, Gliwice, Poland, 2University Clinical Center, Katowice, Poland.

INTRODUCTION: Most meningiomas feature overexpression of somatostatin receptors. The utilization of their specific radiouclide conjugate, the 68Galium-labeled tetrazacyclododecanetetraacetic acid-octreotate (Ga68-DOTA-TATE) enables for accurate and contrast-rich visualization of these tumors in PET-CT scans. This greatly aids the treatment modalities in meningiomas: surgery and irradiation - primarily by helping determine the tumor extent. On the other hand, a quantitative analysis of various PET radiotracer uptake parameters can be used to investigate the tumor’s biological behavior and predict the risk of tumor progression at a minimum of 12 months of follow-up as well as their influence on progression-free survival (PFS).