

Biology and Cancer Section, University College London Great Ormond Street Institute of Child Health, London, WC1N 1EH, UK, London, United Kingdom. ²Department of Neuroradiology, Great Ormond Street Hospital for Children NHS Foundation Trust, London, WC1N 3JH, UK, London, United Kingdom. ³Department of Brain Sciences and Computing, Imperial College London, London, SW7 2BU, UK, London, United Kingdom. ⁴Department of Neurosurgery, Great Ormond Street Hospital for Children NHS Foundation Trust, London, WC1N 3JH, UK, London, United Kingdom. ⁵Developmental Imaging and Biophysics Section, University College London Great Ormond Street Institute of Child Health, London WC1N 1EH, UK, London, United Kingdom. ⁶Department of Neurosurgery, Lucile Packard Children's Hospital, Stanford, CA 94304, USA, Palo Alto, USA. ⁷Department of Neuroradiology, Lucile Packard Children's Hospital, Stanford, CA 94304, USA, Palo Alto, USA. ⁸Department of Radiology, Children's Hospital Colorado, University of Colorado School of Medicine, Aurora, CO 80045, USA, Aurora, USA. ⁹Department of Neurosurgery, National Hospital for Neurology and Neurosurgery, London, WC1N 3BG, UK, London, United Kingdom

BACKGROUND: Postoperative paediatric cerebellar mutism syndrome (pCMS) is a common but severe complication which may arise following the resection of posterior fossa tumours in children. Two previous studies have aimed to preoperatively predict pCMS, with varying results. In this work, we examine the generalisation of these models and determine if pCMS can be predicted more accurately using an artificial neural network (ANN). **METHODS:** An overview of reviews was performed to identify risk factors for pCMS, and a retrospective dataset collected as per these defined risk factors from children undergoing resection of primary posterior fossa tumours. The ANN was trained on this dataset and its performance evaluated in comparison to logistic regression and other predictive indices via analysis of receiver operator characteristic curves. Area under the curve (AUC) and accuracy were calculated and compared using a Wilcoxon signed rank test, with $p < 0.05$ considered statistically significant. **RESULTS:** 204 children were included, of whom 80 developed pCMS. The performance of the ANN (AUC 0.949; accuracy 90.9%) exceeded that of logistic regression ($p < 0.05$) and both external models ($p < 0.001$). **CONCLUSION:** Using an ANN, we show improved prediction of pCMS in comparison to previous models and conventional methods.

IMG-03. IMPACT OF CHILDHOOD CEREBELLAR TUMOR SURGERY ON COGNITION: CAN FMRI SERVE AS A SURROGATE MARKER?

Christian Dorfer¹, Thomas Pletschko², Rene Seiger³, Monika Chocholous², Gregor Kasprian⁴, Karl Roessler¹, Kathrin Kollndorfer⁴, Veronika Schöpf⁴, Ulrike Leiss², Irene Slavc², Daniela Prayer⁴, Rupert Lanzenberger³, Thomas Czech¹; ¹Department of Neurosurgery, Medical University of Vienna, Vienna, Austria. ²Department of Pediatrics and Adolescent Medicine, Medical University of Vienna, Vienna, Austria. ³Department of Psychiatry and Psychotherapy, Medical University of Vienna, Vienna, Austria. ⁴Department of Biomedical Imaging and Image-guided Therapy, Medical University of Vienna, Vienna, Austria

BACKGROUND: Childhood cerebellar pilocytic astrocytomas harbour excellent overall survival rates after surgical resection, but the patients may exhibit specific cognitive and behavioural problems emphasising our current understanding of the cerebellar role in cognition. Functional MRI has catalysed the mechanistic insights into brain functional systems and has already been linked with the neuropsychological performance. We aimed to exploit the question whether functional MRI can be used as a surrogate measure for the cognitive outcome assessment of these patients. **METHODS:** We investigated 13 patients (median age 22.0 years, range 15.2 – 31.7) after a median interval between surgery and examination of 15.0 years (range 4.2 – 20.8) and 16 matched controls. All subjects underwent a functional 3T MRI scans in a resting state condition and a battery neuropsychological tests. **RESULTS:** Patients showed a significantly increased functional connectivity in the precuneus compared to controls ($p < 0.05$) and at the same time impairments in various domains of neuropsychological functioning such as a lower mean WIE IQ percentile ($M = 48.62$, $SD = 29.14$), lower scores in the TMT letter sequencing ($M = 49.54$, $SD = 30.66$), worse performance on the WIE subtest Digit Symbol Coding ($M = 38.92$, $SD = 35.29$), subtest Symbol Search ($M = 40.75$, $SD = 35.28$), and TAP divided attention task ($M = 783.92$, $SD = 73.20$). **CONCLUSION:** Functional MRI has the potential to serve as a surrogate measure for the cognitive outcome assessment. The precuneus brain region is heavily involved in the cerebral associative oversight of cerebellar cognitive function.

IMG-05 IMAGING CHARACTERISTICS OF CNS NB-FOXR2 – A RETROSPECTIVE AND MULTI-INSTITUTIONAL DESCRIPTION OF 25 CASES

Anna Tietze¹, Maarten H. Lequin², Brigitte Bison³, Liz Ivarsson⁴, David Mirsky⁵, Alok Jaju⁶, Ulrike Löbel⁷, Katja von Hoff¹, Kshitij Mankad⁷; ¹Charité Universitätsmedizin Berlin, Berlin, Germany. ²University Medical Center Utrecht, Utrecht, Utrecht, Netherlands. ³University Hospital Augsburg, Augsburg, Augsburg,

Germany. ⁴Queen Silvias Children's Hospital, Sahlgrenska University Hospital, Gotheburg, Gothenburg, Sweden. ⁵Children's Hospital Colorado, Denver, Denver, USA. ⁶Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, Chicago, USA. ⁷Great Ormond Street Hospital, London, London, United Kingdom

BACKGROUND: The CNS neuroblastoma with forkhead box R2 (CNS NB-FOXR2) activation is one of the new embryonal tumor entities in the WHO CNS tumor classification 2021. The data currently available suggest a comparably favourable outcome after craniospinal irradiation and chemotherapy. The entity is poorly characterized on imaging. We therefore aimed to describe imaging features in a multi-center patient cohort. **MATERIAL AND METHODS:** Molecularly and histologically confirmed CNS NB-FOXR2 tumors were retrospectively collected at six pediatric oncology centers. The imaging features on preoperative MRI and CT data were recorded by 8 experienced pediatric (neuro)radiologists in consensus. **RESULTS:** Twenty-five patients were identified (13 females). The majority of tumors were large at presentation (mean $115 \pm SD 83$ ml), showed mostly none or little perifocal edema, enhanced only partly, were often calcified and/or hemorrhagic, were always T2w hyperintense to gray matter, and often had cystic and/or necrotic components. The min. mean ADC values were relatively low (mean $687.8 \pm SD 136.3$ in $10\text{-}6\text{mm}^2/\text{s}$). The tumors originated never infratentorial and were never centered in the midline. Metastases were rare. **CONCLUSIONS:** For the first time, imaging characteristics of the recently described CNS NB-FOXR2 are described in a multi-center cohort. The results of this study may assist in diagnosing these tumors preoperatively. Collaborative pooling of cases is important to gain insight into typical imaging features of rare tumors, especially in view of the increasing molecular-driven subtyping.

IMG-06. COMPARING BETWEEN MR SPECTROSCOPY DONE AT 1.5T AND 3T

Phua Hwee TANG, Sameema Nisa; KK Women's and Children's Hospital, Singapore, Singapore, Singapore

INTRODUCTION: In hospitals with heavily utilised MRI scanners, it may not be possible to schedule the patient on 1 particular scanner for all scans and thus this project was carried out to determine if there is any significant difference in the spectroscopy profile between 1.5 T and 3T MRI scanners late year 2021. **AIM:** To describe the MR spectroscopy profile of normal brain tissue performed on 1.5T and 3T MRI scanners in KK Women's and Children's Hospital. **METHODS:** Three healthy adult volunteers with normal body mass index underwent MRI brain scans after informed consent in this Institute Review Board approved study. MRI brain scans were performed on 1.5T General Electric MRI scanner and 3T Siemens Skyra MRI scanner 1 week apart. NAA/Cr, Cho/Cr and Cho/NAA values were obtained from the right and left cerebral hemispheres. **RESULTS:** Average NAA/Cr in the right cerebral hemisphere is 2.06 ± 0.10 at 1.5T. Average NAA/Cr in the left cerebral hemisphere is 2.01 ± 0.23 at 1.5T. Average NAA/Cr in the right cerebral hemisphere is 1.56 ± 0.09 at 3T. Average NAA/Cr in the left cerebral hemisphere is 1.81 ± 0.29 at 3T. Average Cho/Cr in the right cerebral hemisphere is 1.06 ± 0.14 at 1.5T. Average Cho/Cr in the left cerebral hemisphere is 1.11 ± 0.22 at 1.5T. Average Cho/Cr in the right cerebral hemisphere is 0.90 ± 0.05 at 3T. Average Cho/Cr in the left cerebral hemisphere is 0.95 ± 0.27 at 3T. Average Cho/NAA in the right cerebral hemisphere is 0.51 ± 0.06 at 1.5T. Average Cho/NAA in the left cerebral hemisphere is 0.58 ± 0.00 at 1.5T. Average Cho/NAA in the right cerebral hemisphere is 0.55 ± 0.05 at 3T. Average Cho/NAA in the left cerebral hemisphere is 0.52 ± 0.07 at 3T. **CONCLUSION:** MR spectroscopy values obtained from 1.5T and 3T MRI scanners show no significant difference ($P > 0.05$).

IMG-07. CONTRALATERAL TRANSIENT CONTRAST ENHANCEMENT IN A PATIENT WITH IDH1WT MGMT PROMOTER-METHYLATED GBM RESPONDING TO TMZ AND INDIVIDUALIZED MULTIMODAL IMMUNOTHERAPY

Andrii Matiaschuk, Jennifer Makalowski, Michael Bitar, Peter Van de Vliet, Wilfried Stuecker, Stefaan Van Gool; IOZK, Köln, Germany

Immunotherapy-induced MRI changes remain challenging when treating GBM patients with immunotherapy as part of a combined treatment. The iRANO criteria provide a decision-tree in order to avoid over- and under-treatment reactions when contrast-enhancing lesions become visible and should be interpreted. We report a 34-year female, 34 weeks pregnant, who presented with epilepsy, and was diagnosed with IDH1wt MGMT promoter-methylated GBM after biopsy. On MRI, the left occipital lesion was mostly cystic-necrotic with peripheral contrast enhancement, and crossed over the corpus callosum to the right. The volume was calculated as 64 cm^3 ($abc/2$ formula). She was treated with radiochemotherapy and 12 TMZ cycles.