tients received surgery alone or followed by temozolomide chemotherapy according to the presence of risk factors. RESULTS: At baseline evaluation, maximum glutamate/GABA values were significantly higher (p=0.023) in the peritumoral area of patients with seizures (1.008 ± 0.368) with respect to those without seizures (0.691 ± 0.170). No other metabolites ratio showed significant differences between the two groups. Similar results were obtained when analyzing the metabolites ratio in the examinations during the follow-up. In the cohort of patients with seizures (n.14) variations of metabolite ratios were not associated with tumor location, 1p/19q codeletion, use of AEDs, concomitant chemotherapy or seizure characteristics (type, duration, frequency). CONCLUSIONS: The study is ongoing with the aim of analyzing further the correlations between ratio of metabolites and status of the tumor (stable vs progressive).

NIMG-54. DIFFUSE TUMOR GROWTH PATTERN IS ASSOCIATED WITH WORSE OUTCOME ONLY IN IDH WILDTYPE BUT NOT IN IDH MUTANT GLIOMAS WHO II AND III

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BACKGROUND: Magnetic resonance imaging (MRI) based characterization has previously shown heterogeneity in tumor appearance according to *IDH* mutation status. We have recently investigated the relevance of contrast enhancement to be dependent on *IDH* mutation status in glioma WHO II and III. Here, we aimed at further characterizing tumor growth patterns and their prognostic value in these tumors. METHODS: MRI and clinical data of patients with newly diagnosed glioma WHO II and III from two different centers were retrospectively reviewed. Radiological data such as localization, presence of contrast enhancement, T2-volume as well as tumor growth pattern ("diffuse" vs. "circumscript") were obtained. Progression-free (PFS) and overall survival (OS) were determined and correlated with clinical, radiological and molecular characteristics using univariate and multivariate regression analyses. RESULTS: 390 patients were included, 69% thereof having an *IDH* mutation. The median T2-volume was 46.0 ml, *IDH* mutant tumors being larger (50.7 ml) than *IDH* wildtype tumors (36.0 ml), p = 0.01. A total of 172 tumors were classified as "circumscript" and 218 as "diffuse"; the majority of *IDH* wildtype tumors (71%) were well delineated compared to 51% in the *IDH* mutant group (p< 0.0001). Apart from clinical parameters such as younger age, lower KPS, complete resection and delayed treatment, "circumscript" tumor growth pattern was associated with improved survival in the entire group (p = 0.016). When analyzed according to *IDH* mutation status, "circumscript" tumor growth pattern was significantly associated with OS and PFS (p = 0.006 and p = 0.002) in the *IDH* wildtype, but not in the *IDH* mutant group (p = 0.34 and p = 0.81). CONCLUSION: *IDH* wildtype tumors present more often with a "circumscript" growth pattern on initial T2 MRI. However, this "circumscript" growth pattern was associated with improved survival only in the *IDH* wiltdtype but not in the *IDH* mutant group.

NIMG-55. A QUANTITATIVE ANALYSIS OF BRAIN VOLUME DYNAMICS IN PCNSL PATIENTS TREATED WITH HIGH-DOSE METHOTREXATE-BASED THERAPY

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BACKGROUND: Primary CNS lymphoma (PCNSL) is a rare, infiltrative disease. High-dose methotrexate (HD-MTX) is the backbone of induction regimens for PCNSL. While MTX-associated white matter changes are well-described, treatment-related brain volume loss is much less understood, especially in radiotherapy-naïve cohorts. Here, we aimed to longitudinally quantify the rates of brain volume loss in PCNSL patients treated with HD-MTX. SUBJECTS/METHODS: We included 12 radiotherapy-naïve patients (age mean±SD 61±15y, range 37-84y, 9F) with histopathologically confirmed PCNSL who received HD-MTX induction (mean±SD 12±4 cycles, range 8-18) +/-rituximab. MRIs were collected from within 1 month of HD-MTX initiation until the end of follow-up (mean±SD: 3.7±2.9y). Longitudinal whole-brain segmentation was performed on FLAIR images using the Sequence Adaptive Multimodal Segmentation tool of FreeSurfer. Brain volumes were normalized to the initial scan, white matter lesion volumes were normalized to cerebral volume (nWML). RESULTS: The average rate of cerebral volume change was -2.1±1.9%/year. Half of patients showed marked cerebral volume loss in the first year (-5.6±1.4% vs. -2.0±1.4%; n=10; p=0.003) with the most prominent change occurring within 6-months of treatment initiation (-4.2±1.7% vs. -0.5±1.6; n=12; p=0.004). Cerebral volume loss reached a plateau after the 1-year mark in both groups (0.3±0.8%/year vs. 1.4±3.3%/year; n=8; p=0.4). Patients younger than 61 years exhibited markedly higher rates of cerebral volume loss (-6.2±1.1%/year vs. 2.4±1.5%/year p=0.003), which was corroborated by strong inverse correlation between age and cerebral volume loss (Pearson's r=-0.82, p=0.004). Neither the cerebellar volume, nor the nWML load correlated with age. CONCLUSION: In the present cohort, brain volume loss was approximately four-fold higher than what is described in the healthy aging. Younger patients treated with HD-MTX exhibited more severe cerebral volume loss, which may be due to higher initial brain volume reserve. Detailed analyses of a larger sample are underway.

NIMG-56. THE RARE CASE OF PRIMARY DURAL BASED MARGINAL ZONE B-CELL LYMPHOMA CAMOUFLAGING AS MILD FOCAL DURA THICKNESS AND PACYMENINGEAL ENHANCEMENT

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INTRODUCTION: Primary Dural Based Marginal Zone B-Cell Lymphoma (MZBCL) is a subtype of PCNSL with an incidence rate ranging from 0.6 to 3% of all brain tumors. MZBCL typically presents as an extra-axial mass resembling meningioma. Here we report an unusual case of MZBCL with initial radiographic findings of mild nonspecific thickening tentorium and pachymeningeal enhancement surrounding 7th and 8th cranial nerves. CASE REPORT: A 58-year old woman with clinical history of CMV infection, polyclonal gammopathy and unruptured left ICA aneurysm post coil embolization who presented for an evaluation of mild thickening and enhancement of the left tentorium cerebelli and 7th/8th nerve root complex. Differential considerations included inflammatory/autoimmune conditions (idiopathic hypertrophic pachymeningitis, neurosarcoidosis, Tolosa-Hunt syndrome), infections, structural lesion, benign or malignant neoplasm. Serum studies were normal. Multiple CSF studies were negative. Flow cytometry showed no malignant cells with few small lymphocytes. She was followed with the imaging surveillance for nine months until further increased thickening of dura on MRI. She underwent cerebellar dural biopsy that was consistent with MZBCL composed mainly of small CD20+ B-cells and negative MYD88. PET scan showed no systemic involvement. Bone biopsy revealed no evidence of lymphoma. The focal leptomeningeal enhancement improved significantly after she received four doses of systemic rituximab treatments. DISCUSSION: Our case highlights the importance of surveillance and brain biopsy in cases of mild focal dura/pachymeningeal thickness and enhancement if no conclusive diagnosis has been established, as it might be one of the rare tumors such as MZBLC.

NIMG-57. ASSOCIATION OF RADIOMICS BASED TUMOR SHAPE IRREGULARITY MEASURES AND GAMMA KNIFE DOSE PLANNING INDICES IN VESTIBULAR SCHWANNOMAS

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Gamma knife radiosurgery (GKRS) delivers an unevenly distributed radiation dose to a tumor, with a sharp falloff outside the target. Although the dose inhomogeneity within a tumor is strongly influenced by its shape, routine GKRS dose planning does not account for it. We hypothesized that shape irregularity measures were correlated with treatment planning indices, and might provide insight during treatment planning. The aims of this study were to quantify the shape irregularity measures in vestibular schwannomas, estimate their correlations with core radiosurgical planning measures, and define the most predictive shape feature for dose effectiveness. METHODS: Four dose plan indices, which were the selectivity index (SI), gradient index (GI), efficiency index (EI), and Paddick's conformity index (PCI) were estimated from the GKRS plans of 234 vestibular schwannomas. All dose plans were prepared using Gamma Plan 10.0 and above and