corrected CBV in DSC were significantly higher than group B (p<0.001). In contrast, the ADC showed no marked difference between the two groups. In the distinction between the two groups, the receiver operating characteristic (ROC) analysis showed that the area under the curve (AUC) of the relative ASL value was significantly higher than the other parameters (AUC 0.995, cut-off value 2.34, sensitivity 100%, specificity 99.5%). Discussion/Conclusion: The non-contrast ASL method was extremely useful for diagnosing hemangioblastoma in posterior fossa tumors. The ASL method has been reported helpful for the follow-up of residual tumors or recurrence after surgery. Contrast-enhanced DSC is not always essential for diagnosing posterior fossa hemangioblastoma. It should be noted that measuring the ROI by ASL is difficult when the size of the mural nodule is small.

Key words: Hemangioblastoma | MRI | Arterial spin labeling

NI-12

THE RATIO OF T1-WEIGHTED TO T2-WEIGHTED SIGNAL INTENSITY AND IDH MUTATION IN GLIOMA

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Introduction: Prediction of IDH mutation status for Lower-grade glioma (LrGG) is clinically significant. The purpose of this study is to test the hypothesis that the T1-weighted image/T2-weighted image ratio (rT1/T2), an imaging surrogate developed for myelin integrity, is a useful MRI biomarker for predicting the IDH mutation status of LrGG. Methods: Twenty-five LrGG patients (IDHwt: 8, IDHmt: 17) at Asahikawa Medical University Hospital (AMUH) were used as an exploratory cohort. Twenty-nine LrGG patients (IDHwt: 13, IDHmt: 16) from Osaka International Cancer Institute (OICI) and 103 patients from the Cancer Imaging Archive (TCIA) / Cancer Genome Atlas (TCGA) dataset (IDHwt: 19, IDHmt: 84) were used as validation cohorts. rT1/T2 images were calculated from T1- and T2-weighted images using a recommended signal correction. The region-of-interest was defined on T2-weighted images, and the relationship between the mean rT1/T2 (mrT1/T2) and the IDH mutation status was investigated. Results: The mrT1/T2 was able to significantly predict the IDH mutation status for the AMUH exploratory cohort (AUC = 0.75, p = 0.048). The ideal cut-off for detecting mutant IDH was mrT1/T2 < 0.666 ~ 0.677, with a sensitivity of 58.8% and a specificity of 87.5%. This result was further validated by the OICI validation cohort (AUC = 0.75, p = 0.023) with a sensitivity of 56.3% and a specificity of 69.2%. On the other hand, the sensitivity was 42.9% and the specificity was 68.4 % for the TCIA validation cohort (AUC = 0.63, p = 0.068). Conclusion: Our results supported the hypothesis that mrT1/T2 could be a useful image surrogate to predict the IDH mutation status of LrGG using two domestic cohorts. The decline of the accuracy for the TCIA cohort should be further investigated.

Key words: glioma | IDH mutation | MRI

NI-13

PREDICTION OF OUTCOME AT THE TIME OF DISCONTINUING TMZ-ADJUVANT THERAPY IN IDH-MUTANT LOWER GRADE GLIOMA USING ^{11}C-METHININE PET

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Purpose: This study aimed to clarify whether positron emission tomography with ^{11}C-methyl-L-methionine (^{11}C-met PET) can predict consequential outcomes at the time of discontinuing temozolomide (TMZ)-adjuvant chemotherapy in patients with residual isocitrate dehydrogenase gene (IDH)-mutant lower-grade glioma.Methods: In 30 patients showing residual lesions of IDH-mutant lower grade glioma (16 with diffuse astrocytoma and 14 with anaplastic astrocytoma), we performed ^{11}C-met PET, and calculated the tumor-to-normal brain tissue ratio of standardized uptake values ($SUV_{T/N}$) at the time of discontinuing TMZ-adjuvant chemotherapy. We determined cutoff values to predict tumor relapse using the receiver operating characteristic curve for various prognostic factors including age, Karnofsky performance scale, number of courses of therapy, residual tumor size, and $SUV_{T/N}$. The promotor methylation status of O^6-methylguanine-DNA methyl-transferase gene (MGMT) was assessed using methylation-specific polymerase chain reaction. Progression-free survival (PFS) was compared between groups divided by cutoff values. Uni- and multivariate analyses were conducted using log-rank testing and Cox regression analysis, respectively.Results: Univariate analysis identified MGMT methylation status (p = 0.04) and an $SUV_{T/N}$ of 1.27 (p = 0.02) as predictors of PFS after TMZ discontinuation. In multivariate analysis, both unmethylated MGMT and $SUV_{T/N} \geq 1.27$ remained as strong predictors of unfavorable outcome. Conclusion: The present study suggested that ^{11}C-met PET allows prediction of outcomes comparable to MGMT promotor methylation status at the time of discontinuing TMZ-adjuvant chemotherapy in patients with residual IDH-mutant lower-grade glioma.

Key words: PET | lower grade glioma | MGMT

NI-14

ESTIMATION OF PROPERTY OF MRI NON-CONTRAST ENHANCED LESION OF GLIOBLASTOMA USING T1/T2 RATIO

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Background: Tumor mass of glioblastoma is considered to exist beyond gadolinium-enhancing lesion into T2/FLAIR-high intensity lesions (T2/FL-HIL) on MRI. However, it is challenging to differentiate non-enhancing tumor region (NET) from pure brain edema for T2/FL-HIL. The T1/T2 ratio (rT1/T2) is an MRI metric considered to semi-quantify the tissue relaxation time on MRI. This research tested the hypothesis that rT1/T2 is useful for identifying NET within T2/FL-HIL by comparing it with 11C-methionine positron emission tomography (MET-PET). Method: Forty-six glioblastoma (GBM) patients at Osaka International Cancer Institute and Osaka University Hospital where T1-, T2- and contrast-enhanced T1-weighted MRI and MET-PET were available were included in this study. rT1/T2 maps were obtained after signal corrections were performed, as reported previously. Region-of-interests (ROIs) were defined within T2/FL-HILs beyond the gadolinium-enhanced lesion. MET-PET and rT1/T2 maps were co-registered to the same coordinate system, and the relationship between methionine uptake and rT1/T2 values was examined in a voxel-wise manner. ResultApproximately three million voxels were included for analysis. Lesions with methionine uptake higher than 5.0 on T/N showed 0.7 &lt rT1/T2 &lt 0.98. For those with methionine uptake higher than 3.0, rT1/T2 was between 0.70 and 1.04.DiscussionThis report suggested that rT1/T2 represents histological characteristics of the glioblastoma within T2/FL-HIL. It also indicated that rT1/T2 could be a useful biomarker for detecting NET within T2/FL-HIL for glioblastoma.

Key words: T1/T2 ratio | Glioblastoma | Methionine PET

NI-15

COMPARISON OF AMIDE PROTON TRANSFER IMAGING WITH PERFUSION IMAGING OF USING ARTERIAL SPIN-LABELING FOR EVIDENCE OF TUMOR CELLS IN GLIOMA

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BACKGROUND: Infiltrative gliomas show cerebral edema and tumor infiltration as areas of hyperintensity in FLAIR image. Amide proton transfer (APT) and cerebral blood flow (CBF) are useful for evaluating the tumor invasion. In this study, arterial spin-labeling (ASL)-CBF and APT were compared to determine which method was superior for predicting tumor infiltration in gliomas, pathologically. METHODS: Fifteen specimens from 5 glioma patients with confirmed selective sampling were obtained. Based on APT signal intensity (SI), regions of interests (ROIs) were selected for biopsy. Same regions of these ROIs were marked on the same slice of ASL imaging. Samples were pathologically assessed for cell density and vessel density. APT SI and ASL-CBF were analyzed for each specimen. RESULTS: APT signal intensity (SI) showed a strong cor-