GC growth pattern have a poor prognosis even in low histological grading. In this study, we focused on tumor invasion into white matter fibers. We analyzed the MRI findings focusing on white matter fibers and compared in patients with histologically proven low-grade gliomas (LGGs) with GC pattern and localized LGGs. METHOD: The patients can be classified into four groups according to the range of tumor invasion in T2-weighted image as follows: group 1, more than 3 lobes (n=6); group 2, 1 or 2 lobes infiltrate the hippocampus (n=4); group 3, multifocal (n=2) and group 4 (n=12) localized. In reference to the human brain white matter atlas, the infiltration to the major white matter fibers (uncinate fasciculus, genu, splenium of corpus callosum, inferior fronto-occipital fasciculus, superior and inferior longitudinal fasciculi) was examined. RESULTS: Twenty-five patients (median age 39.5 years; 14 were included in this study. Of these, 20 patients were histologically diagnosed with diffuse astrocytomas, and 5 patients with oligodendrogliomas. The infiltrations into iFO, SLF, and IF of white matter fibers were a poor prognostic factor. The number of infiltrating white matter fibers correlated significantly with the Kaplan-Meier survival curve. CONCLUSIONS: The 2016 WHO classification defines diagnostic entities by combining molecular and histological information and remove GC as a distinct glioma entity. LGGs with GC pattern should be considered to be detected in different types of histologically and molecularly defined gliomas. As the patient numbers analyzed here were small, and larger series reproducing these results would be desirable, MRI findings particularly focusing on infiltration of LGGs into white matter fibers might be important to estimate the prognosis of patients.

NI-19

USEFULNESS OF AMIDE PROTON TRANSFER IMAGE IN IMAGING DIAGNOSIS OF GLIOMA.
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INTRODUCTION: APT image is one of the imaging methods in MRI, and it is a molecular image that images the concentration of an amide group having an amino acid increasing in a tumor, and is expected to be clinically applied in the imaging diagnosis of glioma. On the other hand, MET-PET is useful for diagnosis of glioma because it is well accumulated in tumor cells. Based on the results of pathological diagnosis, we compared the two and verified that APT image is useful. METHOD: The study included 36 patients who underwent APT image and MET-PET. (Glioma WHO2016 Grade:II/III/IV, and Pseudoprogression). MET-PET was administered 370MBq/kg, and the accumulation ratio (TNR) of the tumor part to the normal part was measured. APT image measured APT signal with the region of interest at the tumor site. RESULTS: APT signal in all 36 cases was correlated with 2.19±0.94 and TNR with 2.61±1.55 (r=0.67, p<0.001). The discrimination accuracy between GII/III/IV and Pseudoprogression by APT signal was 84% sensitivity and 100% specificity at threshold 2.0. The APT signal was correlated with the astrocytoma line (GII/III) of 2.69±0.51, and the TNR was 2.43±0.98. The oligodendrogloma line was lower in APT signal than the astrocytoma line, and the TNR was higher. DISCUSSION: APT image is a molecular image that images the concentration of an amide group having an amino acid increasing in a tumor, and is expected to be clinically available to improve in- and through-plane spatial resolution compared with conventional CT scanners, mainly due to smaller slice thickness from 0.5 mm to 0.25 mm, larger channel number from 896 to 1792, and smaller x-ray focus from 0.9 x 0.8 mm to 0.4 x 0.5 mm. PURPOSE: We assessed usefulness of UHRCT to improve delineation of the superficial cerebral venous system in brain CTA for assisting brain tumor surgery by using our routine technique and generated the CTA to delineate the superficial cerebral venous system using the same technique. Two reviewers by consensus subjectively counted the number of the superficial sylvian veins and the cortical veins draining into these veins and the maximal bifurcation order of the cortical veins draining into the superior sagittal sinus. We compared these numbers in the GC and IODA groups using the intra- and extra-axial brain tumors who underwent preoperative MET-PET to measure the tumor/normal (T/N) ratio were performed were the same in every patient. The mean age of all patients was 46.3±13.7 years. The mean ages of the GC (three males and two females) and IODA (two males and three females) groups were 54.0±14.0 and 38.6±5.7 years, respectively. The mean NAA/Cho ratio in the GC and IODA groups were 1.010±0.441 and 0.594±0.449, respectively. The mean T/N ratios in the GC and IODA groups were 1.201±0.030 and 1.169±0.009, respectively. The higher NAA/Cho ratio in the GC lesions may reflect the abundance of normal neural tissue in GC compared with IODA. Nonetheless, the T/N ratios of the two groups were comparable. The discrepancy suggests that GC cells have higher tumor metabolic activity than IODA cells. Therefore, when GC is simply classified as grade II glioma based on neuroimaging diagnosis, the possibility of underestimating its malignant potential at the single-cell level should be considered.

NI-22

IMPROVED DELINEATION OF THE SUPERFICIAL CEREBRAL VENOUS SYSTEM IN BRAIN CT ANGIOGRAPHY BY ULTRAHIGH-RESOLUTION CT FOR ASSISTING BRAIN TUMOR SURGERY
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BACKGROUND: In brain CT angiography (CTA) for assisting brain tumor surgery, delineation of the superficial cerebral venous system is critical for selecting the optimal surgical approach. This delineation is, however, limited using conventional CT scanners, including an area-detector CT (ADCT) scanner, due to their insufficient spatial resolution. Since March 2017, a state-of-the-art ultra-high-resolution CT (UHRCT) scanner has been clinically available to improve in- and through-plane spatial resolution compared with conventional CT scanners, mainly due to smaller slice thickness from 0.5 mm to 0.25 mm, larger channel number from 896 to 1792, and smaller x-ray focus from 0.9 x 0.8 mm to 0.4 x 0.5 mm. PURPOSE: We assessed usefulness of UHRCT to improve delineation of the superficial cerebral venous system in brain CTA for assisting brain tumor surgery by using our routine technique and generated the CTA to delineate the superficial cerebral venous system using the same technique. Two reviewers by consensus subjectively counted the number of the superficial sylvian veins and the cortical veins draining into these veins and the maximal bifurcation order of the cortical veins draining into the superior sagittal sinus. We compared these numbers in the GC and IODA groups using the intra- and extra-axial brain tumors who underwent preoperative MET-PET to measure the tumor/normal (T/N) ratio were performed were the same in every patient. The mean age of all patients was 46.3±13.7 years. The mean ages of the GC (three males and two females) and IODA (two males and three females) groups were 54.0±14.0 and 38.6±5.7 years, respectively. The mean NAA/Cho ratio in the GC and IODA groups were 1.010±0.441 and 0.594±0.449, respectively. The mean T/N ratios in the GC and IODA groups were 1.201±0.030 and 1.169±0.009, respectively. The higher NAA/Cho ratio in the GC lesions may reflect the abundance of normal neural tissue in GC compared with IODA. Nonetheless, the T/N ratios of the two groups were comparable. The discrepancy suggests that GC cells have higher tumor metabolic activity than IODA cells. Therefore, when GC is simply classified as grade II glioma based on neuroimaging diagnosis, the possibility of underestimating its malignant potential at the single-cell level should be considered.

NI-23

ULTRA-HIGH-RESOLUTION CT ANGIOGRAPHY FOR BRAIN TUMOR SURGERY
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BACKGROUND: Preoperative accurate evaluation of arteries and veins can help avoid ischemic complication of brain tumor surgery. The latest ultra-high-resolution CT (UHRCrT) angiography (Aquilion PrecisionTM; Canon Medical Systems) has recently become available for clinical testing of the main arteries and critical perforating arteries by brain CT, compared to conventional CT (ADCT). UHRCrT provides slice collimation of 0.25 mm x 160 and matrix size of 1024 x 1024 or 2048 x 2048. Major features of this CT scanner include an improved detector system (the minimal slice thickness, 0.25 mm; the maximal channel number, 1792) and a small x-ray focal spot (the smallest focal spot, 0.4 x 0.5 mm) compared to a standard multi-detector CT (MDCT) scanner (the minimal slice thickness, 0.5 mm;