relation with cell density (R = 0.887, P < 0.0001). ASL-CBF showed no correlation with cell density (R = 0.240; P = 0.3836) but a correlation with vessel density (R = 0.697; P = 0.0038). In linear regression analysis, APT SI showed a positive relationship with cell density (R2 = 0.787, P < 0.0001, linear regression; y = 30.70 + 6.24E-3*x). CONCLUSIONS: APT imaging was superior in predicting cellular proliferation than ASL-CBF and a powerful predictor of cell density. APT imaging allowed revelation of novel clues reflecting tumor proliferation in brain tumor; to date, this is the first known report to assess cell density among various brain tumors and conditions after treatment.

Key words: APT imaging | ASL | Glioma

NI-16

VERIFICATION OF APT IMAGE AND RELATIONSHIP WITH T2/FLAIR MISMATCH SIGN IN WHO2016 BRAIN TUMOR PATHOLOGY CLASSIFICATION

Masami Shirota[1], Masayuki Nitta[2], Taiichi Saito[2], Syunsuke Tsuduki[2], Atsushi Fukui[2], Souko Ikuta[3], Ayako Yoshida[1], Yoshihiro Muragaki[2,3], Takakazu Kawamata[2]; [1]Central Radiation Department Tokyo Women's Medical University,Tokyo, Japan [2]Neurosurgery Tokyo Women's Medical University [3]Institute of Advanced BioMedical Engineering and Science Tokyo Womens Medical University

Introduction: Amide Proton Transfer Imaging(APT)is an MRI imaging method that images the increased concentration of amide groups in tumors and is expected to be clinically applied to the diagnostic imaging of gliomas.On the other hand,T2/FLAIR mismatch sign(T2/FLms) has been proposed as an MRI finding specific to astrocytoma with IDH gene mutation.This time,in the WHO2016 Brain Tumor Pathological Classification,we report the verification of the pathological gene classification of APT and the retrospective verification based on the pathological diagnosis results of whether there is a relationship between APT and T2/FLms. Method: We examined 88 cases of preoperative glioma (Grade:G2/3/4)in which APT/T2/FLAIR was imaged.resultIt showed a high value in high malignancy and a significant difference was observed. In the verification of genetic classification, the measured APT values were 1.91 ±0.71 for oligodendroglioma(16 cases),2.58±0.17 for astrocytoma(2 cases),2.40±0.90 for anaplastic oligodendroglioma(12 cases),Anaplastic astrocytoma(20 cases)2.63±0.42,The oligodendroglioma system showed lower values than the astrocytoma system.For anaplastic astrocytoma IDH mutant and glioblastoma IDH mutant,APT measurement values were measured after evaluating the presence or absence of T2/FL ms. APT measured values are anaplastic astrocytoma IDH mutant T2/FL ms present(7 cases) 2.63±0.38,T2/FL ms not (5 cases) 2.76±0.37, glioblastoma IDH mutant T2/FL ms present(5 cases)2.67±0.50, no T2/FL ms(3 cases)3.48±0.27,suggesting low APT measured values with T2/FL ms,respectively.ConclusionIn the verification of genetic classification, the oligodendroglioma system shows a lower value than the astrocytoma system,and it is considered that it can be one of the options such as treatment policy.Regarding the relationship between T2/FL ms and APT,it was suggested that the APT measured value with T2/FL ms tended to be low,but since it wasreported that the sensitivity of T2/FL ms was 30%,it was verified by accumulating cases.is required.

Key words: APT | T2/FLAIR mismatch sign, glioma

NI-18

A QUANTITATIVE ANALYSIS OF INTRAOPERATIVE 3T-DIFFUSION TENSOR IMAGING PARAMETERS FOR FUNCTIONAL PREDICTION WITH MOTOR ELOQUENT GLIOMA PATIENTS

Tomoyuki Kawataki[1], Mitsuto Hanihara[1], Masakazu Ogiwara[1], Hiroyuki Kinouchi[1]; [1]Department of Neurosurgery, University of Yamanashi, Yamanashi, Japan

OBJECTIVE: In motor eloquent glioma surgery, the value of intraoperative diffusion tensor (iDT) imaging was not established to preserve motor function. This study aimed to investigate a relationship between postoperative motor function and iDT imaging parameters, including fractional anisotropy (FA), mean diffusivity (MD), and shortest distance (SD) from resected tumor margin to the corticospinal tract (CST) of gliomas in motor eloquent areas. METHODS: This retrospective study enrolled 20 patients with newly diagnosed supratentorial glioma who underwent surgery and intraoperative magnetic resonance imaging at our hospital. Patients were divided into two groups (i.e., worsening and non-worsening groups) based on their manual muscle test scores before and three months after surgery. We obtained the mean FA and MD values bilaterally, along with identification of the CST and determined the ratios (the affected side / the contralateral side). The SD was measured between the CST and the resected margin of the tumor. We evaluated the quantitative analysis of these parameters related to motor functional outcomes. Moreover the correlation was measured between these parameters and the maximum reduction rate of cortical motor evoked potentials (MEPs) during surgery. RESULTS: In the worsening group (n = 5), the mean FA ratio was lower and the mean MD ratio was higher compared with the non-worsening group (n = 15; P < 0.001 and P < 0.01, respectively). Cut-off values were 0.87 for FA and 1.08 for MD. SD was 7.95 mm in the non-worsening group and 0.44 mm in the worsening group (P < 0.01). These iDT based parameters, the mean FA ratio and the SD, were well correlated with the maximum reduction rate in MEP (R = 0.72 and 0.80, respectively). CONCLUSIONS: The mean ratio of FA, MD, and SD using iDT imagings predict postoperative motor function and help in optimal surgical planning in patients with motor eloquent glioma.

Key words: 3T iMRI | DTI-tractography | motor eloquent glioma surgery

NI-19

A CASE OF LEBER'S HEREDITARY OPTIC NEUROPATHY WITH DIFFUSE WHITE MATTER CHANGES MIMICKING GLIOMATOSIS CEREBRI.

Wakiko Saruta[1], Ichiyo Shibahara[1], Madoka Inukai[1], Shunsuke Kanayama[2], Hisanao Akiyama[3], Hitoshi Ishikawa[2], Sumito Sato[1], Takuichiro Hide[1], Toshihiro Kumabe[1]; [1]Department of Neurosurgery, Kitasato University School of Medicine, Sagamihara, Kanagawa, Japan [2]Department of Opththalmology, Kitasato University School of Medicine, Sagamihara, Kanagawa, Japan [3]Department of Neurology, St. Marianna University School of Medicine, Kawasaki, Kanagawa, Japan

BACKGROUND: Leber's hereditary optic neuropathy (LHON) is a mitochondrial disease characterized by bilateral severe subacute central vision loss and a mutation in the mitochondrial DNA (mtDNA). The cranial magnetic resonance imaging (MRI) of LHON patients varies from subtle to multiple white matter changes. However, they rarely present with diffuse infiltrative white matter changes. CASE REPORT: We report a case with diffuse white matter changes mimicking gliomatosis cerebri (GC). The histological findings included only mild glial hyperplasia without immunohistochemical positivity supporting the diagnosis of glial tumors. Analysis of mtDNA obtained from the blood and brain tissue revealed mutation of m.11778G>A in the NADH dehydrogenase 4 gene, which confirmed the case as LHON. Immunohistochemistry of the brain tissue revealed 8-hydroxy-2'-deoxyguanosine positivity, suggesting the presence of oxidative stress. CONCLUSION: LHON is extremely difficult to diagnose unless we suspect or know the disease. The present case brings attention not only to LHON but other mtDNA mutated diseases that need to be considered with diffuse white matter changes or GC.

Key words: Leber's hereditary optic neuropathy | gliomatosis cerebri | mitochondrial disease

NEURO-COGNITIVE FUNCTION/QOL/PATIENT CARE/PALLIATIVE CARE (NQPC)

NQPC-2

COGNITIVE FUNCTION OF A LOW-GRADE GLIOMA PATIENT TREATED WITH RADIATION THERAPY 28 YEARS AGO

Kazuki Yamada[1], Makoto Ideguchi[2], Masao Matsutani[2]; [1]Gotanda Rehabilitation Hospital, Tokyo, Japan [2]Gotanda Rehabilitation Hospital, Tokyo, Japan

While there are many reports that long-term survivors of low-grade glioma patients treated with radiation therapy cannot lead a healthy social life due to cognitive dysfunction, we report a low-grade glioma patient with almost normal cognitive function even after radiation therapy 28 years ago. CASE REPORT. A 64-year-old woman developed with sudden left hemiparesis and was diagnosed as a small infarction in the left corona radiata. After treated by anticoagulant therapy, she was admitted to our hospital for rehabilitation. Twenty-eight years ago, she underwent surgical resection and radiation therapy with 60 Gy for astrocytoma (WHO grade 2) in the right insular cortex. At the time of this admission, she presented with a good MMSE score of 30 points, but she couldn't walk and her left hand was less maneuverable. After 109 days of intensive rehabilitation in our hospital, she was discharged on a cane walk, and returned to work as a gas station clerk. COGNITIVE FUNCION. We evaluated her cognitive function on TMT-A/B test, CAT (Clinical Assessment for Attention)and WAIS-4. The TMT test was normal with age adjustments. In CAT, the percentage of correct answers for the 7 constituent items was within the standard range, but in the task of evaluating the required time, a slight delay in processing speed was observed. In WAIS-4, the Full scale IQ was 98 points (normal range) including normal 3 of 4 constituent items. But, only the PSI (processing speed) of 75 point was below the standard range. CONCLUSION: We observed a slight delay in processing speed on her high-level cognitive function tests, but determined