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 5 lobes (n=6); group 2, 1 or 2 lobes infiltrate the bilateral longitudinal fasciculi; group 3, multicentric (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 callous, inferior fronto-occipital fasciculus, superioraptic longitudinal fasciculus) was examined. RESULTS: Twenty-five patients (mean age 39.5 years) were included in the study. Of these, 20 patients were histologically diagnosed with diffuse astrocytomas, and 5 patients with oligodendrogliomas. The infiltrations into iof, slf, and il 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 GRADEII 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:GII/III/IVand 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.GII APT signal 2.30±0.43, TNR 4.02±2.12, GIII APT signal 2.67±0.69, TNR 4.02±2.12, GIV APT signal 2.84±0.51, TNR 4.02±2.12. The TNR 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.PurposeWe assessed usefulness of UHRCT to improve delineation of the superficial cerebral venous system in brain CTA for assisting brain tumor surgery compared with conventional ADCT METHODS: We retrospectively enrolled patients with intra- and/or extra-axial brain tumors who underwent preoperative brain CT for assisting brain tumor surgery by UHRCT or ADCT using our routine technique and generated the CTA to delineate the superficial cerebral venous system using the same technique. Two reviewers by consensus sub- jectively 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 and it was 2.44±0.51 and TNR was 3.78±1.51. The APT signal of the astrocytoma line (GII/III) was 2.69±0.51, and the TNR was 4.02±2.12. The oligodendroglia line was lower in APT signal than the astrocytoma line, and the TNR was higher. DISCUSSION: APT image is a non-invasive, can easily provide important information, and have the same diagnostic potential as MET-PET. Although TNR of oligodendro- glioma (GII/III) tends to be high, the APT signal which is not affected by 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.
the maximal channel number, 896; the smallest x-ray focus size, 0.8 x 0.9 mm). RESULTS: Until July 2019, 168 patients with brain tumor under- went UHRCT angiography. As high resolution image could visualize cor- tical arteries and cortical veins clearly, it helped to decide approach route to the tumor and achieve accurate biopsy of even small lesion. Identification of tumor feeders and passing arteries allowed for efficient feeder coagula- tion and preservation of passing artery, avoiding the ischemic change of small vessels around the tumor. UHRCT angiography resulted in visualization of perforating arteries, which helped to preserve perforator by predicting the location during tumor removal. CONCLUSION: UHRCT angiography can visualize even tiny arteries and veins around the tumor, and contributes to avoid the risk of ischemic complication.

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

NQPC-01
CURRENT STATUS AND PROBLEMS OF ADVANCE CARE PLANNING AND PALLIATIVE CARE FOR MALIGNANT BRAIN TUMOR
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Purpose: Genomic medicine is in progress, but the median survival of glioblastoma is 14–16 months. It seems to have the same life prognosis as stage 4 colorectal cancer. Irreparable pancreatic cancer, lung cancer, colon cancer. Palliative care including Advance care planning (ACP) at first diagnosis of glioblastoma is important. We conducted a questionnaire survey to understand the current status of Japanese oncologists. Method: In July 2018, a questionnaire of 37 items was sent by email to 767 members of Japanese Society of Neuro Oncology, and in August replies were received from 154 persons (20%). The same 22-item questionnaire in 2012–2013 was compared internationally with a report (Wallert T., et al., 2015) by Society of NeuroOncology and the European Association of NeuroOncology. In addition, we compared domestically with a 30-item questionnaire (Narita et al. 2009) in 2007. The nonparametric Mann-Whitney’s U test was mainly used. Result: 1 Characteristics of Japan in comparison with Western countries: p<0.01: 1. The number of doctors in charge is overwhelmingly male. 2. The specialty is predominantly neurosur- geons. 3. Aging of NeuroOncologists, 4. medical treatment place: the propor- tion of university is low. 5. frequent regular examination of the patient. Result 2 Changes compared with domestic (Japan) data 11 years ago (p<0.01): 1. Expla- ning the condition in more detail. 2. Explaining to not only the family but also the patient. 3. Continuing chemotherapy more aggressively. 4. The place of death: decreasing at hospitals and increasing at home. 5. Frequency with a respirator decreased. 6. About 70% at the end of the period, nasal injection and gastrostomy are applied. Conclusion: In the treatment of malignant brain tumors in Japan, a male neurosurgeon who has over 15 years of experience actively continues chemotherapy and appears to see it with nasal injection.

NQPC-03
PROGNOSTIC SIGNIFICANCE OF QUALITY-OF-LIFE EVALUATION OVER TIME IN CLINICAL PRACTICE FOR PATIENTS WITH GLIOBLASTOMA
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BACKGROUNDs: Evaluation of quality of life (QOL) has been consid- ered as an indispensable modality for assessment of treatment impact for patients with malignant brain tumor, especially glioblastoma. However, changes in patients’ QOL under clinical practice with current standard of care (SOC) have not been clearly and routinely explored, so that solid baseline QOL data under SOC are not available for reliable comparison with those with novel treatments. Here we retrospectively examined changes in QOL during SOC in glioblastoma patients. PATIENTS AND METHODS: Pa- tients with histologically confirmed glioblastoma treated in our institute from April 2016 to April 2019, who underwent QOL evaluations using EORTC QLQ-C-30/BN-20 were eligible. Outcomes were assessed with clin- ical factors including therapeutic regimen. RESULTS: Forty-two patients, median age 64 yo (25–87), male/female 26/16, were identified having longi- tudinal QOL data along with medical records. Median initial KPS and mini- mental state examination (MMSE) score were 70 (20–90) and 27, respectively, suggesting this cohort containing those in good performance status. In four patients whose QOL queries were answered by a family, median KPS was 16, indicating the impaired NCF affect self-report ability. Long term survivors without progression remained at an adequate functional scale level, while those who recurred declined in functional scale after progression, often ac- companied with an increase in symptom scales associated with tumor loca- tion. The domains of declined functional scales varied among patients, and there was no clear tendency associated with patients’ backgrounds such as age and gender. The functional scale level improved in most cases when the recurrent disease was successfully treated, but it gradually declined in a step- wise fashion by repeated recurrences. CONCLUSIONS: Changes in QOL in patients with glioblastoma were found to be associated with disease status. The small number of patients who could be evaluated for QOL over time pre- vented extracting significant factors affecting QOL outcomes.

NQPC-05
BEVACIZUMAB AFTER PROGRESSION OF GLOBLASTOMA PROLONGS PATIENT’S LIVING TIME AT HOME IN THE LAST 90 DAYS
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Bevacizumab (Bev) is currently available for recurrent glioblastoma to improve a patient’s quality of life (QOL). To maintain a patient’s daily activity, Bev is sometimes continued beyond radiographical progression until neurological deteriorations. However, the benefit of continuous use of Bev in its terminal stage is not clarified. To clarify the benefit, we retrospec- tively analyzed clinical data of glioblastoma patients who entered the terminal stage. Ninety-five patients, who died by supra-tentorial newly-diagnosed glioblastoma progression from 2008 to 2018, were included. Bevacizumab use in the last 90 days, living time at home or final place of death were retrospectively analyzed. Of 95, twenty-six received Bevacizumab be- yond progression in the last 90 days (Bev-group), and 49 did not (non-Bev group). The median overall survival time is not different between both, and the number of patients, who died at home, is seven (26.9%) in Bev group and six (12.2%), respectively. Mean final administration day from death is 49.2 days and the mean living time at home in the last 90 days is 49.2 days in the Bev group, which is statistically longer than 24.0 days of the non-Bev group (p=0.0016). To continue Bev beyond progression prolongs the living time at home in the last 90 days in glioblastoma patients, and Bev should be considered in its palliative care.

NQPC-06
FUNCTIONAL OUTCOMES OF INITIAL TREATMENTS FOR PATIENTS WITH PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA ASSESSED BY ADL AND NEURO-COGNITIVE FUNCTION.
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BACKGROUNDs: Primary central nervous system lymphoma (PCNSL) frequently causes severe damage of activities of daily living (ADL) and neurocognitive function (NCF) due to extensive brain infil- tration, necessitating their appropriate assessment and measures even in clinical practice. Since few studies have focused on the changes in the level of ADL and NCF in the course of PCNSL treatment, we retrospec- tively analyzed the effect of initial treatment of PCNSL in view of ADL and NCF. METHODS: Among 55 patients (male:23, female:32) who were newly diagnosed PCNSL treated in our institution from January 2014 to June 2019, 22 were evaluated with both ADL and NCF. Remission induction therapies consisted of high-dose methotrexate alone (two patients), R-MPV (rituximab, methotrexate, procarbazine, and vincristine)(17 patients), and R-MPV+radiation therapy (three patients), according to the patients’ conditions. Rehabilitation staffs intervened from the beginning, providing specific exercises and periodically evaluating scores of Karnofsky Per- formance Status (KPS) and Mini Mental State Examination (MMSE). RE- SULTS: Mean age was 68.4 y/o (range 34 to 85). After induction therapies, there were 11 complete responses (CRs), eight partial responses (PRs), and three progressive diseases (PDs). Both KPS and MMSE scores improved after induction therapy, from median 70 (40–90) to 90 (50–90), and from 24 (12–30) to 27 (0–30), respectively. Among three patients who underwent RT, KPS declined in two (one CR/one PR). CONCLUSIONS: Case-adjusted induction therapies resulted in significant radiographical responses, and the longitudinal evaluation of ADL and NCF by rehabilitation staffs could val- idate their maintenance or improvement over time through effective treat- ments and early rehabilitation intervention. However, three was difficulty in assessing patients with higher brain dysfunction such as aphasia and social adjustment disorder. Further study is needed to include more patients and to explore more appropriate evaluation batteries and timings during and after completion of induction therapy for PCNSL.