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grade 0 was 23 cases (33%), grade 1 was 18 cases (26%), grade 2 was 28 cases (41%). There were 16 deaths in grade 0 (69.6%), 10 deaths in grade 1 (55.6%), 15 deaths in grade 2 (53.5%). CONCLUSIONS: In this study, there was no statistically significant difference in the SWI or T2* post-group. However, there was a tendency for many long-term survivors in the SWI or T2* positive group.

MET-10
PRELIMINARY REPORT OF RADIOTHERAPY FOR BRAIN METASTASES FROM BREAST AND KIDNEY USING MASK SYSTEM OF LEKSELL GAMMA KNIFE ICON
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OBJECT: Leksell Gamma Knife Icon enables us to apply new methods of immobilization using mask fixation and the option of fractionated treatment. This provides exceptional accuracy and precision of radiosurgery, making it a possibility for many more disease types and many more patients to be treated.

METHODS: We retrospectively analyzed 97 patients (140 times) with brain metastases from breast (B group) and 26 patients (33 times) with brain metastases from kidney (K group) and who underwent Gamma Knife Icon using mask fixation between September 23th, 2017 and June 30th, 2020 at Rakusai Shimizu Hospital. Patients with small, few, newly diagnosed, and non-eloquent area tumors were treated in a single session. If the tumor volume was larger than 5.0 ml, recurrence, or the location was in an eloquent area, we applied a fractionated schedule. If the tumor number was large, we selected a multisession schedule. Median tumor number was three (1~4) in B group and two (1~3) in K group. Median tumor size was 2.7 (0.01-58.8) ml in B group and 2.8 (0.02-123.5) ml in K group. We selected fractionated schedules as follows: 7.0 Gy x 5Fr (5~10 ml), 4.2 Gy x 10Fr (10-20ml), 3.7 Gy x 10Fr (20-30ml), 3.2 Gy x 10Fr (30ml-).

RESULTS: 32 (B) and 14 (K) cases were treated in a single session, 80 (B) and 40 (K) cases in two sessions, 30 (B) and 7 (K) cases in three sessions, and 5 (B) and 3 (K) cases in multiple sessions. Median survival times after Icon treatment was 28.2 (B) and 15.5 (K) months. Local control rates were 89% (B) and 85% after 12-month Icon treatment. Qualitative survival rates were 91% (B) and 86% (K) after 12-month Icon treatment. There were no statistically differences between two groups.

CONCLUSIONS: Although these results are limited to short periods, survival rates, local control rates and qualitative survival rates were within the acceptable ranges.

OTHER BRAIN TUMORS (BT)

BT-09
ANHIDROSIS IN NEUROHYPOPHYSIAL GERMINOMA TREATED WITH CBDCA AND VP-16
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INTRODUCTION: Acquired generalized anhidrosis (AGA) is the disease with non-congenital, non-segmented diffuse sweating dysfunction and is associated with neurological signs and dysautonomia except for anhidrosis. Here we have experienced 2 cases of AGA in the patient with neurohypophyseal germinoma after carboplatin (CBDCA) plus etoposide (VP-16) (CARE) therapy. Relationship of AGA to neurohypophyseal germinomas and their treatment is discussed. CASES: We experienced two young (26 y/o and 27 y/o) patients with AGA. One patient (Patient A) was a female neurohypophyseal germinoma cases of anhidrosis. They received CARE as chemotherapy and whole ventricular irradiation. They showed heat retention 2 to 3 years after initial treatment without recurrence of AGA. Because acetylcholine sweating test was negative and skin biopsy revealed normal sweat gland structure, the diagnosis of acquired idiopathic anhidrosis was considered. After steroid pulse therapy, sweat function recovery partially and completely. DISCUSSION: AGA and germinomas are both rare diseases. So, the present 2 cases have similar clinical settings, that anhidrosis may not be idiopathic but secondary. Affected responsible site of anhidrosis in the present cases is thought to be acetylcholine receptor in the sweat cells. The present cases did not have any known disease with anhidrosis and did not receive any medication which cause anhidrosis written in the statement of the virtues of a medicine. Commonly used drugs in both cases are infusion solutions, CARE and related drugs, hormone stimulating test agents. Recently anhidrosis is reported in a case of cancer of unknown primary tumor site after using CBDCA and PTX. Both of the present cases are used CBDCA, which may cause anhidrosis. CONCLUSION: CBDCA may attributed to the occurrence of AGA based on hypothalamic vulnerability.

RARE CASE SERIES (CS)

CS-01
RAPID RECURRENT AND ANAPLASTIC TRANSFORMATION OF A PILOCYTIC Astrocytoma in an Elderly Patient
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BACKGROUND: Rapid recurrence of a pilocytic astrocytoma with anaplastic transformation is extremely rare. The case of an elderly patient with a cerebellar pilocytic astrocytoma with anaplastic transformation during short-term follow-up is reported. CASE DESCRIPTION: An 83-year-old woman presented initially with dizziness and a gait deviation to the right. Magnetic resonance imaging (MRI) demonstrated a homogeneously enhanced mass in the right cerebellar hemisphere, and the tumor was subtotally removed by right suboccipital craniotomy. Histological examination showed that the tumor cells contained eosinophilic cytoplasm and spindle-shaped processes with Rosenthal fibers and eosinophilic granular bodies, diagnosed as a typical pilocytic astrocytoma (PA). The MIB-1 index was less than 1%. The patient did not receive postoperative adjuvant radiation and chemotherapy. Two months after surgery, MRI showed growth of the residual tumor adjacent to the fourth ventricle, causing obstructive hydrocephalus. She underwent surgery again, and the tumor was totally removed. Histological findings showed mitotic cells and increased cellularity compared with the primary tumor, which was compatible with anaplastic transformation of PA with a MIB-1 index of 50%. Postoperatively, she was observed with best supportive care without postoperative adjuvant therapy. Nine months after the second operation, she died due to tonsillar herniation and obstructive hydrocephalus caused by a recurrent tumor. An autopsy was performed. CONCLUSION: It is extremely rare, as in the present case, that a cerebellar PA in an elderly patient recurs rapidly with anaplastic transformation, despite deferred postoperative adjuvant therapy including radiation and chemotherapy. A novel molecular-targeted therapy is needed for anaplastic PA showing aggressive biological behavior.

CS-03
BRAF V600E MUTATION MEDIATES FDG-METHIONINE UPTAKE MISMATCH IN POLYMORPHOUS LOW-GRADE NEUROEPITHELIAL TUMOR OF THE YOUNG
Takahiro Hayashi1, Kensuke Tateshi1, Naoki Ikeyaga1, Naoko Uda2, Jo Sasame1, Yohei Miyake1, Tetsuhiko Okabe1, Ryogo Minamamoto3, Hidetoshi Murata1, Daisuke Utsunomiy1, Syo’i Yamamak2, Tetsuya Yamamoto3; 1The Department of Neurosurgery, Yokohama City University, Kanagawa, Japan

We present a case of a 14-year old boy with tumor-associated refractory epilepsy. Positron emission tomography imaging demonstrated a region with heterogeneous high 11 C-methionine uptake and a region with homogenous low 18 F- fluorodeoxyglucose uptake within the tumor. Histopathological and genomic analyses confirmed the tumor as BRAF V600E-mutated PLNTY (polymorphous low-grade neuroepithelial tumor of the young). Within the high-methionine-uptake region, we observed increased protein levels of L-type amino acid transporter 1 (LAT1) and constituents of the mitogen-activated protein kinase (MAPK) pathway. We also found that LAT1 expression was linked to BRAF V600E mutation and subsequent activation of MAPK signaling. Pharmacological inhibition of the MAPK pathway suppressed LAT1 expression and cell viability in PLNTY cells. Collectively, our results indicate that BRAF V600E mutation-activated MAPK signaling induces specific metabolic alterations in PLNTY, and may represent an attractive target in the treatment of the disease.

CS-09
EXTRA-PARENCYHALY (PERIPHERAL) ATYICAL TERATOID / RHABDOID TUMORS
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AT/RT is a malignant embryonal tumor reported by Rorke in 1996. Authors reported first AT/RT in Japan in 1998. This tumor entity was included in newly embryonal tumor in WHO 2000, and tumors of Japanese patients has been reported more than 80 cases in the past. This AT/RT is a tumor in the brain parenchyma that a medulloblastoma and PNET and the possibility that it has been misdiagnosed have had pointed out. On the other hand, it is reported that there is the type that we should call peripheral AT/RT, which rarely occurs in extra-parenchyma. We want to propose that there is such special tumor group. In the results, age: 17 infants were
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COT-01

EXPERIENCE OF INTRODUCING ALTERNATING ELECTRIC FIELD THERAPY FOR AN ELDERLY GLOBLASTOMA PATIENT LIVING ALONE

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INTRODUCTION: In December 2017, alternating electric field therapy (EFT) for glioblastoma was covered by insurance in Japan, but because of treatment complexity, the number of cases of introduction remains small, and the threshold for introduction is even higher for elderly patients living alone.

CASE PRESENTATION: The patient was an 84-year-old man, who are living alone, and an open biopsy was performed for a contrast-enhanced neo-angiogenic lesion in the frontal lobe. The clinical diagnosis was glioblastoma and Ki-67 was 60%. Following initial treatment, the tumor recurred within 1 month prior to the initiation of alternating EFT. Nonetheless, steroid was administered, he could not walk without aid and was forced to admit on the day after the introduction, and rehabilitation treatment was instituted. Motor aphasia was slowly disappeared, and he could walk stably without help after 2 weeks and was discharged on day 28. Magnetic resonance imaging prior to discharge indicated that the tumor had shrunk and cerebral edema had ameliorated. Following discharge, the treatment could be continued with the help of a home-visiting nurse, and no adverse events were noted.

DISCUSSION: In the current case, treatment with temozolomide (TMZ) could not be conducted because of neutropenia, but alternating EFT may have been effective because of the rapidity of the tumor. In Japan, from December 2017 to April 2020, alternating EFT was initiated in 440 patients, 5 (1.1%) of whom were patients living alone, including the current case. The other four were all men in their 50s and not elderly.

CONCLUSION: In the case of elderly patients living alone, medical practitioners may be able to control the tumor by preparing the environment for alternating EFT for patients and keeping the patient willing to undergo treatment.

COT-02

THE OPENING OF TUMOR TREATING FIELDS WITH ONLINE SUPPORT SYSTEM

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BACKGROUND: EF-14 trial showed the efficacy of tumor treating fields (TTF), and TTF was approved as a standard therapy for glioblastoma. In TTF opening, Device Support Specialist (DSS) should explain how to use it for the patient and family. However, no DSS does always stay in our Yamaguchi prefecture, and DSS has to come to our hospital across other prefectures. On the other hand, COVID-19 infection is still spreading and it is sometimes tough to move from a big city to countryside. Here, we would present the first experience of TTF opening with online DSS support. A case REPORT: A 68 years old man had right hemisepsis. MRI showed multiple lesions in the left hemisphere, and biopsy showed glioblastoma. After 1 month from chemo and radiotherapy, TTF was introduced. DSS from Tokyo explained how to use TTF via PC camera with TV monitor. A skilled neurosurgeon and special nurse also helped them in front of him. His head and the attached array were well checked from DSS with PC camera moving around him. Everything was smooth and he started TTF.

CONCLUSION: Online medicine should be absolutely spreading. In countryside, it is hard that DSS comes to our hospital from a big city. TTF opening could be favorable via online system with skilled medical stuffs.

COT-04

CIRCULATING BIOMARKER FOR GLOBLASTOMA AND PRIMARY CENTRAL NERVOUS SYSTEM LYMPHOMA -NEXT GENERATION SEQUENCING OF SMALL NONCODING RNA-

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OBJECTIVE: Glioblastoma (GBM) and Primary Central Nervous System Lymphoma (PCNSL) are common intracranial malignant tumors. They sometimes present similar radiological findings and diagnoses could be difficult without surgical biopsy. For improving the current management, development of non-invasive biomarkers are desired. In this study, we explored the differently expressed circulating small noncoding RNA (snRNA) in serum for specific diagnostic tool of GBM and PCNSL.

MATERIAL & METHODS: Serum samples were obtained from three groups: 1) GBM patients (N=26), 2) PCNSL patients (N=14), and healthy control (N=114). The total small RNAs were extracted from serum. The whole expression profiles of serum snRNAs were measured using Next-Generation Sequencing System. We analyzed serum levels of snRNAs (15–55 nt) in each serum samples. The difference of snRNAs expression profile among three groups were compared. Data analysis was performed by logistic regression analysis followed by leave-one-out cross-validation (LOOCV). The accuracy of diagnostic models of snRNAs combination were evaluated by receiver operating characteristic (ROC) analysis.

RESULTS: We created the combination models using three snRNA in each models based on the logistic regression analysis. The model 1 (based on snRNA-X1, X2 and X3) enabled to differentiate GBM patients form healthy control with a sensitivity of 92.3% and a specificity of 99.2% (AUC: 0.993). The model 2 (based on snRNA-Y1, Y2 and Y3) enabled to differentiate PCNSL patients form healthy control with a sensitivity of 100% and a specificity of 93.9% (AUC: 0.984). The model 3 (based on snRNA-Z1, Z2 and Z3) enabled to differentiate GBM patients from PCNSL patients with a sensitivity of 92.3% and a specificity of 78.6% (AUC: 0.920).

CONCLUSION: We found three diagnostic models of serum snRNAs as non-invasive biomarkers potentially useful for detection of GBM and PCNSL from healthy control, and for differentiation GBM from PCNSL.

COT-05

EXPERIENCE OF FERTILITY PRESERVATION IN 3 MALE CASES AND 1 FEMALE CASE WITH HIGH-GRADE GLIOMA

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High-grade glioma (HGG) has a low survival rate, and fertility preservation (FP) has rarely been discussed in the field of Japanese neurosurgery. We report on 4 reproductive patients, including 2 male patients who became biological fathers. Case 1 was a 23-year-old man with anaplastic oligodendroglioma (AO) of the right front lobe. Temozolomide maintenance therapy (TMZ-MT) was completed 42 courses after the initial surgery. Nonetheless, steroid was administered, he could not walk without aid and was forced to admit on the day after the introduction, and rehabilitation treatment was instituted. Motor aphasia was slowly disappeared, and he could walk stably without help after 2 weeks and was discharged on day 28. Magnetic resonance imaging prior to discharge indicated that the tumor had shrunk and cerebral edema had ameliorated. Following discharge, the treatment could be continued with the help of a home-visiting nurse, and no adverse events were noted.

DISCUSSION: In the current case, treatment with temozolomide (TMZ) could not be conducted because of neutropenia, but alternating EFT may have been effective because of the rapidity of the tumor. In Japan, from December 2017 to April 2020, alternating EFT was initiated in 440 patients, 5 (1.1%) of whom were patients living alone, including the current case. The other four were all men in their 50s and not elderly.

CONCLUSION: In the case of elderly patients living alone, medical practitioners may be able to control the tumor by preparing the environment for alternating EFT for patients and keeping the patient willing to undergo treatment.

COT-07

CEREBROVASCULAR COMPLICATIONS IN ADULT PATIENTS WITH MALIGNANT BRAIN TUMOR

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BACKGROUND: According to the development of new treatment modalities, patients with malignant brain tumors are longer surviving and they have more chances to have stroke.

STUDY POPULATION: We retrospectively reviewed 309 patients with ischemic stroke and 445 patients with hemorrhagic stroke who visited Kyoto University Hospital between January 2010 and December 2019 and the as...