METHOD: With reference to clinical trials of high evidence level and public database registration, we researched trials, arms, and designs for each of 3 genotypes, oligodendroglioma (OD), astrocytoma IDH mutant and IDH wild (A-IDHm, A-IDHw), RESULTS: The standard arm common to all genotypes is follow-up (EORTC22845) for G2 low-risk, and chemoradiation therapy (CRT) for G3. Standard arm for G2 high-risk, depending on a genotype, is follow-up (EORTC22845), radiation alone (A-IDHm and IDHw, A-IDHw: RTOG9802 subanalysis), or PCV chemoradiation therapy (OD and A-IDHm: 9802). Furthermore, the standard arm and the test arm were replaced by the matrix-like method on each genotype. Results in the G2/3-targeted trial, there was no standard arm all in the three genotypes. In addition, there were a design of master protocols for many genotype and a design that has arms of randomization and observation. CONCLUSION: Applying the master protocol, the possibility of novel G2/3 target trial in which the arms in existing which in MATRIX form was suggested. With the improvement of the genetic analysis infrastructure, prospective observational research and a well-designed intervention research plan for each genotype are required.

PEDIATRIC CLINICAL TRIALS/TherAPEUTIC STUDIES (PEDT)

PEDT-02

CLINICAL USAGE OF NCC ONCOPANEL/FOUNDATIONONE CDx FOR PEDIATRIC/AYA PATIENTS WITH RECURRENT MALIGNANT BRAIN TUMORS

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BACKGROUND: Analyses of somatic mutations in malignant brain tumor have been to make effective treatment strategies. NCC Oncopanel and FoundationOne CDx are custom targeted next-generation sequencing (NGS) panels. The cost for this analysis is 560,000 yen covered by National Health Insurance in Japan since June 2019. These methods can be applied for the solid cancers with no established therapies and relapsed after the standard therapies. Following these inclusion criteria, most malignant brain tumors, especially recurrent malignant brain tumors in pediatric/AYA generations, can be included. OBJECT: To report the results of our initial experiences. METHODS: In the last one year, we utilized these NGS panels for five patients with recurrent malignant brain tumors in this generations: 2 epithelial glioblastomas; 1 anaplastic meningioma; 1 diffuse astrocytoma (gliomatosis cerebri); 1 atypical choroidal plexus papilloma. RESULTS: Final recommended treatments are as follows: BRAF/MEK inhibitors, bevacizumab, or anti- PD-1 antibody for one epithelial glioblastoma; MEK inhibitor for another epithelial glioblastoma previously treated by BRAF inhibitor and bevacizumab; ERK1/2 inhibitors for anaplastic meningioma. The diffuse astrocytoma had IDH1/32H mutation. There was no clinical trial using IDH inhibitor for recurrent diffuse astrocytoma; thus, the final recommendation for this case was rechallenge of temozolomide. To date, only one NGS for a choroidal plexus papilloma has been reported (Arch Pathol Lab Med, 2017). Our case had multiple actionable gene alterations, including TERT1 mutation and amplification of various genes. Unfortunately, there was no druggable gene alteration among these. CONCLUSIONS: Insurance-covered cancer gene panel tests could represent effective treatment options for some malignant brain tumors in pediatric/AYA generations. If the relapse is local and can be treated by repeat resections, we think the surgery is the first-line choice. But, in another situation, information from NGS panels should be obtained positively. Efforts to increase the utility of off-label use of drugs are encouraged.

PEDT-03

A CLINICAL TRIAL OF DENDRITIC CELL-BASED IMMUNOTHERAPY FOR REFRACTORY BRAIN TUMORS IN CHILDREN

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INTRODUCTION: Cerebral edema is the most frequent adverse event of BCNU wafer, which is used as local chemotherapy of malignant glioma. However, effective factor of this event is unknown. Moreover, there is no consensus about cerebral edema and perioperative seizure, which is often observed in glioma. Here, we report risk factor of cerebral edema with BCNU placement and relationship with perioperative seizure in malignant glioma cases.

MATERIAL AND METHOD: Thirty-one case of adult malignant glioma who underwent BCNU placement in our institute between March 2013 to March 2019 were investigated. The cases were dichotomized to two groups; patient with postoperative transient cerebral edema (CE+ group) and patient without postoperative transient cerebral edema (CE- group).

RESULTS: Postoperative cerebral edema associated with placement of BCNU was observed in 9 out of 31 patients (29%). Tumor malignancy was significant parameter for postoperative cerebral edema (p=0.003). Other factors such as, age, gender, laterality, tumor location, primary or recurrent, number of BCNU wafers, duration of recurrence were not significant for postoperative cerebral edema. Seizure was seen in 14 patients (45%), and cerebral edema was not significant parameter for seizure. Tumor malignancy was significant parameter for postoperative transient cerebral edema. Tumor malignancy was significant parameter for seizure (p=0.0004). Although postoperative seizure was observed in 4 patients (44%) with CE+ group, neither maximum volume (mean 61.1 ml) nor change ratio (mean 354%) of FLAIR-high-intensity region was related with postoperative transient cerebral edema. Other factors such as recurrence, BCNU placement, number of BCNU wafers, duration of recurrence were not significant for postoperative transient cerebral edema and perioperative seizure, which is often observed in glioma. Here, we report risk factor of cerebral edema with BCNU placement and relationship with perioperative seizure in malignant glioma cases.

CONCLUSIONS: Tumor malignancy was important factor for patients who underwent placement of BCNU wafer with postoperative cerebral edema and seizure. On the other hand, there was no relationship between postoperative cerebral edema and perioperative seizure in patients treated with BCNU wafer.
hydrocephalus. TAE was performed under local anesthesia in all cases, using a coil alone in two cases and liquid or particle embolization material in five cases. The day before direct surgery, TAE was performed in four cases, one of whom underwent surgical resections for precentral gyrus glioma. Glioma grades for 27 patients were Grade II in 6 cases, Grade III in 7 cases, and Grade IV in 13 cases. 11 patients were recurrent glioma cases and glioma grade for these patients were Grade II in 4 cases, Grade III in 3 cases, and Grade IV in 4 cases. Extent of resection for 27 patients was biopsy in 2 cases, partial resection in 16 cases, and more than 90% of resections in 9 cases. 6 patients underwent awake surgery and glioma grade for those patients were Grade II in 3 cases, Grade III in 2 cases, and Grade IV in 1 case. Median extent of resection for patients who underwent awake surgery was 90%. Transient neurological worsening was observed in 5 patients, however, no patient exhibited permanent neurological deficit. Surgical resections for primary motor cortex glioma were feasible in selected patients without severe neurological complication. Careful intraoperative awake mapping is desirable to achieve maximum resections.

STMO-08
VALIDATION OF THE ENDOSCOPIC 5-ALA FLUORESCENCE DIAGNOSIS FOR INTRAVENTRICULAR TUMORS
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Intraoperative 5-ALA fluorescence diagnosis (PDD) has been shown to improve tumor resection rates in surgery for malignant glioma. Recently, the usefulness of PDD has been reported in tumors other than malignant glioma. However, the fluorescence of intraventricular tumors is not easy to observe under the microscope, because excitation light could not reach enough to the deepest part of the brain. Therefore, we performed endoscopic 5-ALA fluorescence diagnosis of intraventricular tumors and evaluated its usefulness. Ten cases of intraventricular tumors were included in the study. There were 3 germ cell tumors, 2 metastatic brain tumors, 2 pilocytic astrocytomas, and 1 malignant lymphoma. Subependymaloma and medulloblastoma did not show fluorescence. Among the cases with confirmed fluorescence, the fluorescent sites were targeted for biopsies for germ cell tumors and malignant lymphomas. For metastatic brain tumors and subependymalomas, the extent of removal was determined at the time of removal, and the presence of residual tumor was confirmed by fluorescence after removal. Endoscopic 5-ALA fluorescence diagnosis for intraventricular tumors was useful in determining the target of biopsy or the extent of excision and in assessing residual tumors.

STMO-09
RECOVERY FROM SPEECH DEFICIT AFTER INJURY TO FRONTAL ASLANT TRACT IN GLIOMA SURGERY
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BACKGROUND: The frontal aslant tract (FAT) is a white matter fiber connecting the superior frontal gyrus to the lateral inferior frontal gyrus. Damage to FAT in dominant hemisphere can lead to speech deficits which, in most cases, resolve within weeks to months. However, little is known about mechanisms of recovery and factors for predicting permanent language deficits. METHODS: Eighteen patients with glioma (age ranged 24 to 78, 10 glioblastomas and 8 lower grade gliomas) located in the medial frontal lobe in the dominant hemisphere involving the supplementary motor area (SMA) and FAT were included. FAT was visualized using diffusion tensor imaging tractography in pre- and postoperative MRI. Postoperative language deficit, resected area of FAT and surrounding brain regions including the cingulate gyrus and corpus callosum (CC) were retrospectively reviewed. RESULTS: In 17 of 18 cases, postoperative language deficits were observed. Speech deficits resolved within a month in 12 cases, while recovery was incomplete in five cases. In two patients without complete recovery, CC located beneath SMA was removed because of tumor infiltration. Other two patients had substantial injury of middle third portion of FAT. The last case had preceding infarction in the contralateral frontal white matter including FAT. In cases with complete language recovery, transcortical fibers connecting the contralateral SMA to the ipsilateral inferior frontal gyrus were detected by postoperative DTI-tractography. These fibers were damaged anywhere along its length in patients without complete language recovery, indicating that they may play an important role in recovery after FAT injury. CONCLUSION: Injury to CC or middle third portion of FAT can cause permanent language disorder. Transcortical fibers from contralateral SMA seems to be involved in the recovery from language deficit after injury to FAT. In glioma surgery involving dominant SMA or FAT, these fibers should be preserved to avoid permanent speech deficit.

STMO-11
SUPRATOTAL RESECTION OF GLOBLASTOMA WITH METHIONINE PCT
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OBJECTIVE: To assess the resection of both of contrast-enhanced (CE) and methionine-uptake (MU) and the oncological outcome in newly diagnosed glioblastoma. METHODS: This retrospective study included a glioblastoma cohort from Chiba University who met the two criteria, i) total resection of CE tumor, ii) preoperative evaluation with methionine positron