continued every 2–3 weeks until disease progression. Newly-diagnosed (de novo) glioblastoma was categorized as primary GBM (pGBM). Other MG were categorized as non-pGBM. Results: Kyoto University Research Reactor stopped irradiation for clinical use in February 2019. Twenty-five patients (14 pGBM and 11 non-pGBM) were treated with this combination therapy between June 2013 and February 2019. The median Overall survival (OS) after BNCT was 21.4 months for pGBM and 73.6 months for non-pGBM, respectively (p = 0.0428). The median progression-free survival (PFS) after BNCT was 8.3 months for pGBM and 15.6 months for non-pGBM, respectively (p = 0.0207). The objective response rate was 72 %. Alopecia occurred in all patients. Adverse events ≥ grade 3 were grade 3 proteinuria in four patients, grade 5 myocardial infarction in one patient, and grade 5 meningitis in one patient. Conclusion: BNCT plus bevacizumab showed a long OS and a long PFS, compared to our previous studies of BNCT alone for recurrent MG. Bevacizumab could provide beneficial effects not only for tumor itself, but also radiation injury. Further research with a larger sample using accelerator-based BNCT and bevacizumab is required to elucidate the efficacy and safety of this combination therapy.

Key words: bevacizumab | BNCT | glioma

ACT-5

PROGNOSIS OF IDH-MUT LOWER-GRADE GLIOMAS IN HOKKAIDO UNIVERSITY HOSPITAL

Shigeru Yamaguchi[1], Yukitomo Ishi[1], Michinari Okamoto[1], Ryousuke Sawaya[1], Hiroaki Motegi[1], Hiroyuki Kobayashi[2], Shunsuke Terasaka[2], Miki Fujimura[1]; [1]Department of Neurosurgery, Faculty of Medicine, Hokkaido University [2]Kashiwaba Neurosurgical Hospital

Background: WHO grade 2 and 3 adult gliomas are nowadays getting together as lower-grade gliomas (LrGGs), but we had been recognized grade 3 (G3) tumors as high-grade and grade 2 (G2) tumors as low-grade. In this report, we investigate the treatment and prognosis of the patients with LrGG harboring IDH mutations in our institutions. Methods:We retrospectively review primary treatments and their prognosis for LrGG patients with IDH mutation since 2003. They categorized as astrocytomas and oligodendrogliomas according to 1p/19q loss-of-heterozygosity status. Prognosis were evaluated by overall survival. Postoperative primary treatments applied chemo-radiotherapy (CRT), radiotherapy only (RT), chemotherapy only (CT), and observation (Ob). Results: 36 astrocytomas and 60 oligodendrogliomas were identified. In astrocytomas, the patients with G3 (N=16) were treated by CRT (N=14) or CT (N=2), and the patients with G2 (N=20) were treated by CRT (N=2), RT (N=3), CT (N=3), or Ob (N=12). In oligodendrogliomas, the patients with G3 (N=34) were treated by CRT (N=32) or CT (N=2), and the patients with G2 (N=26) were treated by CRT (N=3), RT (N=1), CT (N=5), or Ob (N=17). 10-year survival rate (10yOS) of astrocytomas and oligodendrogliomas are 54% and 90%, respectively (p=0.002). According to histological malignancy, 10yOS of G3 and G2 astrocytomas were 54% and 54%, respectively (p=0.97) and that of G3 and G2 oligodendrogliomas were 86% and 100%, respectively (p=0.64). In both group, there are no different of prognosis according to histological malignancy. Discussion: There was no prognostic different between G2 and G3 astrocytomas in our institution. Since the treatment intensity for G2 and G3 astrocytomas were clearly different, the primary treatment for G2 astrocytomas might be insufficient. On the other hand, there were no prognostic different between G2 and G3 oligodendrogliomas in our institution, as with recent reports, so the primary treatment intensity for oligodendrogliomas should be appropriate.

Key words: lower-grade glioma | overall survival | IDH

ACT-6

CLINICAL MANIFESTATIONS OF THE PATIENTS WITH RELAPSED GLIOBLASTOMA AFTER BEVACIZUMAB TREATMENT

Miyu Kikuchi[1], Masamichi Takahashi[1], Syunsuke Yanagisawa[1], Makoto Ono[1], Yasuji Miyakita[1], Yukie Tamura[1], Daisuke Kawauchi[1], Yoshitaka Narita[1]; [1]The Department of Neurosurgery, National Cancer Center Hospital, Tokyo, Japan

Introduction:The outcome of glioblastoma (GBM) is improving recently, but still only temozolomide and bevacizumab (BEV) are recognized as the effective agents that are reimbursed in Japan. On large clinical trials, BEV prolonged progression free survival (PFS) but the remaining survival period from the relapse after BEV is only 3–5 month. On this study, we retrospectively analyzed the data of GBM patients who were treated with BEV to explore the best usage of BEV.Methods:230 patients were diagnosed as GBM and received BEV from July 2013 to March 2021 in our institution. Among them, 104 patient, whose clinical courses were followed, were included in this study. (M:F=59:45, median age was 65.5) Results:The patients were divided into three groups by when they used BEV; upfront group at first line therapy, 1st relapse group at second line, and 2nd+ relapse group at more than third line. There were 42, 35, 27 patients in each group. The median overall survival (OS) was 17.6, 24.7, 46.1 month (p<0.0001), median PFS after BEV treatment (PFSpBEV) was 8.8, 5.1, 5.0 month (p=0.2532), and the median survival after BEV treatment (OSpBEV) was 15.0, 9.9, 9.2 month (p=0.4437), respectively. There were 64 patients (22, 25, 17 in each group) who reached progressive disease (PD) after BEV. The median survival after PD (OSpBEVpPD) was 4.5, 5.8, 4.3 month (p=0.1590), respectively. Discussion:At the first onset, we use BEV only when the patients have low PS. Our results showed that OS was significantly longer when BEV was used in the later stage, but there was no significant difference in OS or PFS after BEV treatment. Especially OSpBEVpPD was 4–6 month regardless of the timing of BEV. To improve the treatment outcome of GBM, breakthrough therapy is needed in addition to optimizing the usage of BEV.

Key words: Bevacizumab | Glioblastoma | relapse

ACT-8

CURRENT STATUS AND PROSPECTS FOR THE TREATMENT OF MALIGNANT GLIOMA USING CANCER GENE PANEL TESTS

Shinichiro Koizumi[1], Ippei Makita[1], Tetsuro Sameshima[1], Kazuhiko Kurozumi[1]; [1]The Department of Neurosurgery, Hamamatsu University School of Medicine

Introduction: The cancer gene panel test was covered by insurance in June 2019. Our institution started the test in May 2020 and has experienced 10 cases, so we will report on the current status and future prospects. Methods: The subjects were 10 patients who underwent the cancer gene panel test using FoundationOne CDx. Results:The cases included 8 glioblastomas, an anaplastic astrocytoma, and an anaplastic oligodendroglioma. The total number of tumor mutational burden (TMB) was judged to be low in all cases, and the microsatellite instability test (MSI) showed no instability in all cases (MSI-Stable). The total number of genetic changes detected was 11 ± 5.0, oncogene mutations were 5.3 ± 2.4, and gene mutations of unknown relevance to cancer were 5.7 ± 2.8. Major oncogene mutations were IDH1 mutation in 4 cases, ATRX mutation in 2 cases, TP53 mutation in 6 cases, and BRAF V600E mutation in 1 case. Based on the test results, a 25-year-old man with BRAF V600E mutation was initiated into the NCCH1901 study (Patient-Proposed Healthcare Services). A case with IDH1 mutation (47-year-old male) entered a phase I clinical trial of a mutant IDH1 inhibitor. It is estimated that the chance of finding an appropriate drug by cancer gene panel test is about 10–20%. However, in cases that are resistant to standard treatment, the benefits can be expected if the drugs associated with the cancer gene panel test can be used. Conclusions: Although Malignant gliomas are often TMB-low and MSI-stable and the response rate to molecular-targeted drugs and other therapies is not high, there are some cases that can be salvaged by performing the cancer gene panel test. It is suggested that the active use of cancer gene panel test may contribute to the development of new drugs with high response rates and the improvement of prognosis.

Key words: glioma | cancer gene panel | FoundationOne CDx

PEDIATRIC CLINICAL TRIALS/THERAPEUTIC STUDIES (PEDT)

PEDT-1

INTEGRATED DIAGNOSES OF PEDIATRIC GLIOMAS IN OUR INSTITUTE BY CIMPACT-NOW RECOMMENDATIONS THE ROLE OF RADIATION AND CHEMOTHERAPY IN THE TREATMENTS OF TERATOMATOUS GERM CELL TUMORS

Toshihiro Yamamura[1,3], Kaoru Tamura[1], Daisuke Kobayashi[2], Motoki Inaji[1], Yoji Tanaka[1], Taketoshi Maehara[1]; [1]Department of Neurosurgery, Tokyo Medical and Dental University [2]Department of Human Pathology, Tokyo Medical and Dental University [3]Department of Neurosurgery, Soka municipal hospital

Purpose:Since many genetic abnormalities in glioma have been revealed in recent years, Integrated diagnoses are necessary in the updated fourth edition of the WHO Classification of Tumors of the Central Nervous System(CNS) published in 2016. The Consortium to Inform Molecular and Practical Approaches to CNS Tumor Taxonomy (cIMPACT-NOW) was established to provide a forum to evaluate and recommend proposed changes to future CNS tumor classification. We retrospectively classified pediatric gliomas in our hospital in accordance with cIMPACT-NOW recommendations. Methods: This study includes 13 consecutive glioma patients under the age of 18 who underwent surgical resection at our hospital from 2000 to 2021. Histopathological diagnoses and molecular status such as IDH, H3F3A and BRAF were analyzed. Results: There were four females and nine