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 chemoradiotherapy (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 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.

SURGICAL/INTRAOPERATIVE THERAPY/ MONITORING (STMO)

STMO-01 CEREBRAL EDEMA AND PERIOPERATIVE EPILEPSY DUE TO PLACEMENT OF BCNU WAFER FOR MALIGNANT GLIOMA

INTRODUCTION: Cerebral edema is the most frequent adverse event of BCNU wafer, which is used as local chemotherapy of malignant glioma. However, predictive factor of this event is unknown. Moreover, there is no consensus about cerebral edema and perioperative seizure, which is often observed in gloma. 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 patients 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 wafer 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 cerebral edema. Tumor malignancy was significant parameters 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 T2-W high-intensity region was correlated with postoperative cerebral edema.

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.

STMO-02 EFFICACY OF PREOPERATIVE EMBOLIZATION FOR HEMANGIOBLASTOMA

INTRODUCTION: Preoperative transarterial embolization (TAE) for hemangioblastoma carries a risk of cerebral infarction and hemorrhagic complications, and its safety and efficacy are controversial.

METHOD: Twenty-two cases of hemangioblastoma (cerebellar: 18 cases, medulla oblongata: 3 cases, medulla oblongata: 1 case) treated via direct surgery in our hospital from 2007 to 2020 were enrolled.

RESULTS: Preoperative TAE was performed in 6 cases of cerebellar hemangioblastoma (1 bilateral case) and 1 case of spinal hemangioblastoma. The embolization order were only Superior cerebellar artery (SCA) in 3 cases, SCA/anterior inferior cerebellar artery (AICA)/posterior inferior cerebellar artery (PICA) in 2 cases, AICA/PICA in 1 case, and single drainage in 5 cases. Tumors were 30 mm in all cases (25 mm on 1 side in bilateral cases), and solid nodular lesions were commonly in the upper surface of the cerebellum. Cerebellar edema was severe in five cases with neural destruction. Autologous cultured tumor cells obtained from surgical specimens were fused with autologous DCs using polyethylene glycol. The fusion cells (FC) were inoculated intradermally in the cervical region in three cases each 28–84 days cycle. Toxicity, progression-free survival (PFS), and overall survival (OS) of this trial were evaluated. RESULTS: Six patients were enrolled, three with high grade glioma and three with ependymoma. Median age at first course of immunotherapy was 10 years (range 8–23 years). Time from first course of immunotherapy was 13.5 months (range 3–33 months). All patients with immunotherapy were well tolerated and no adverse event without local erythema in injected site. Median progression free survival and overall survival were 18 months and 15 months, respectively. CONCLUSIONS: FC immunotherapy with autologous DCs and tumor cells for brain tumor in children and young adults were extremely well tolerated and encouraging. Further phase II study of FC immunotherapy is planned to improve prognosis and overcome treatment related neurological sequelae for highly malignant tumors.

STMO-03 EFFICACY OF PREOPERATIVE EMBOLIZATION FOR HEMANGIOBLASTOMA

INTRODUCTION: Cerebellar hemangioblastoma is a rare benign vascular tumor of young adults with high risk of intratumoral hemorrhage and rapid recurrence. The current standard of care is direct surgical excision with microsurgical or endovascular techniques. In recent years, transarterial embolization (TAE) has been increasingly used as a preoperative technique to reduce tumor vascularity and improve surgical outcomes. However, the efficacy and safety of TAE in treating cerebellar hemangioblastoma are not well established.

METHOD: This study aimed to evaluate the efficacy and safety of preoperative TAE for cerebellar hemangioblastoma. A retrospective chart review was conducted on all patients with cerebellar hemangioblastoma who underwent TAE at our institution between January 2015 and December 2020. The primary outcomes were change in tumor size and rate of surgical complications. The secondary outcomes were change in tumor vascularity and rate of postoperative complications.

RESULTS: Ten patients (mean age 40 years, range 20–70 years) were included in the study. All patients had a single cerebellar hemangioblastoma. The median tumor size before TAE was 6.0 cm (range 3.0–9.0 cm). The median number of embolization sessions was 2 (range 1–3). After TAE, the median change in tumor size was -2.5 cm (range -5.0 to 0.0 cm). The median change in tumor vascularity was -2.0 (range 0 to -5), indicating a significant reduction in tumor vascularity. The rate of surgical complications was 10% (1/10), and the rate of postoperative complications was 20% (2/10). There were no cases of intratumoral hemorrhage or tumor shrinkage.

CONCLUSIONS: Preoperative TAE is an effective and safe technique for reducing tumor vascularity and improving surgical outcomes in patients with cerebellar hemangioblastoma. However, further studies with larger sample sizes and longer follow-up periods are needed to confirm these findings and to evaluate the long-term efficacy and safety of TAE.