

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 which underwent emergency decompression due to severe cerebellar edema. Three cases were intentionally embolized on the day of direct surgery. The median blood loss during direct surgery was 100 ml. Although cerebral infarction was observed in all cases, there were no cases of brain stem infarction or hemorrhagic complications. The Modified Rankin Scale at discharge was 0 in 2 cases, 1 in 3 cases, 3 in 1 case, and 4 in 1 case.

DISCUSSION/CONCLUSION: Preoperative TAE for hemangioblastoma reduced the blood loss for direct surgery. Same-day TAE avoided neurological deficit due to cerebral infarction and cerebellar edema. To prevent severe infarction, guiding the microcatheter to the vicinity of the tumor bed is important.

STMO-03

SURGICAL RESECTION FOR PRECENTRAL GYRUS GLIOMA

Noriyuki Kijima¹, Manabu Kinoshita^{1,2}, Ryuichi Hirayama¹, Naoki Kagawa¹, Haruhiko Kishima¹; ¹Department of Neurosurgery, Osaka University Graduate School of Medicine

Primary motor cortex glioma is usually considered unresectable because of its high risk for motor deficit. However, recent reports suggest that surgical resection for primary motor cortex brain tumor is feasible for selected patients. In this study, we analyzed the neurological outcomes for 27 patients who 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 those 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-07

ADVERSE EVENTS RELATED TO THE GLIOBLASTOMA SURGERY AND THEIR PERIOPERATIVE MANAGEMENT IN OUR HOSPITAL

Hideki Kashiwagi¹, Shinji Kawabata¹, Seigo Kimura¹, Ryokichi Yagi¹, Naokado Ikeda¹, Naosuke Nonoguchi¹, Motomasa Furuse¹, Masahiko Wanibuchi¹; ¹Department of Neurosurgery, Osaka Medical College, Osaka, Japan

BACKGROUND: The standard treatment for glioblastoma is surgical resection following chemoradiation therapy. The rate of removal or the amount of residual tumor has some impact on the prognosis of patients with glioblastoma, but the highly invasive nature of this tumor makes complete removal limited to the contrast-enhanced lesions difficult due to its localization. Furthermore, when postoperative seizures and venous thrombosis are included in surgery-related complications, these perioperative adverse events can cause delays in the initiation of chemoradiotherapy and delay the return to work and home, such as prolonged hospitalization and rehabilitation time.

METHODS: We retrospectively reviewed the perioperative status of the recent 50 consecutive cases with histologically confirmed as glioblastoma at our hospital, the patient background, tumor localization, and perioperative treatment, and so on.

RESULTS: The major perioperative complications were ischemic or hemorrhagic complications, epileptic seizures, venous thrombosis, and pneumonia; CTCAE grade 2 or higher, grade 3 or higher, and grade 4 occurred in about 40%, 20%, and 10%, respectively, with some patients having multiple complications.

DISCUSSION: Although there was a tendency for ischemic changes around the cavity of the resection as the resection rate increased, most cases were asymptomatic and it seemed to be acceptable if residual brain function could be preserved. Residual tumors tended to show hemorrhagic changes and epileptic seizures because this is thought to be that the tumor was deliberately left in place to preserve function, based on the localization of the tumor. Postoperative FDP levels were useful in predicting the development of deep vein thrombosis and pulmonary artery thromboembolism.

CONCLUSION: Because glioblastoma has short survival time and patient PS before and after surgery varies greatly depending on tumor localization, it is important to consider risk-benefit strategies for each case and to establish a scheme for a seamless transition from perioperative management to the introduction of postoperative therapy and maintenance therapy.

STMO-08

VALIDATION OF THE ENDOSCOPIC 5-ALA FLUORESCENCE DIAGNOSIS FOR INTRAVENTRICULAR TUMORS

Masahiro Nonaka¹, Junichi Takeda¹, Tetsuo Hashiba¹, Akio Asai¹; ¹Department of Neurosurgery, Kansai Medical University

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, 1 malignant lymphoma, 1 subependymoma, and 1 medulloblastoma (recurrent). The tumors were located in the third ventricle in four cases, the lateral ventricle in three cases, the lateral ventricle and the third ventricle in two cases, and the aqueduct in one case. Tumor removal was performed in 6 cases and tumor biopsy in 4 cases. Intraoperative fluorescence could be observed in eight cases: three germ cell tumors, two metastatic brain tumors, two pilocytic astrocytomas, and one malignant lymphoma. Subependymoma 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 pilocytic astrocytomas, 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 ASLANI TRACT IN GLIOMA SURGERY

Kuniaki Saito¹, Keiichi Kobayashi¹, Daisuke Shimada¹, Shohei Iijima¹, Nobuyoshi Sasaki¹, Yuta Sasaki¹, Yoshiaki Shiokawa¹, Motoo Nagane¹; ¹Department of Neurosurgery, Kyorin University Faculty of Medicine

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, transcallosal 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. Transcallosal 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 GLIOBLASTOMA WITH METHIONINE PET

Ozaki Ko¹, Seiichiro Hirono¹, Tomoo Matsutani¹, Yasuo Iwadata¹; ¹Department of Neurological Surgery, Chiba University School of Medicine, Chiba, Japan

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