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**SURGICAL TREATMENT FOR HIGH-GRADE AVMS AND RECOVERY OF POSTOPERATIVE NEUROLOGICAL DEFICITS**

***Introduction***

*We have performed surgical resection of AVMs with S-M grade III and IV in cases the radiological evaluation of the brain function around the nidus by using diffusion tensor tractography or fMRI suggested the safety. In this paper, In this paper, our basic techniques and result of current cases were reviewed.*

**Materials and methods**

Between 2000 and 2011, I performed 71 cerebral AVMs. Among them, Seventeen AVMs with S-M grade III and seven AVMs with grade IV were analyzed. Age was ranging from 2 to 65 (average 27+14y.o.) and ten patients were male. Sixteen AVMs exhibited hemorrhagic onset, three AVMs epilepsy, and six AVMs were found incidentally. There were 2 frontal AVMs, 9 parietal AVM, 1 temporal AVM, 4 occipital AVMs, 6 cerebellar AVMs, and 2 basal ganglia AVMs. Preoperative symptoms were headache in 5 patients, disturbance of consciousness in 3, motor or sensory disturbance in 3, aphasia in 2, visual field defect in 3, cerebellar symptom in 3, and cranial nerve palsy in 4. Surgery was performed by using neuronavigation, intraoperative DSA and indocyanine green videoangiography in recent cases. 14 AVMs were resected only by open microsurgery and 10 AVMs were treated by combination of surgery and preoperative embolization. Deterioration and recovery of neurological symptoms were evaluated

by comparison of preoperative symptoms and symptoms at discharge.

**Results**

22 AVMs were totally removed in the initial operation and remaining 2 AVMs were extirpated by additional operation or stereotactic radiotherapy. Preoperative mean mRS and mRS at discharge was  $1.5 \pm 1.1$  and  $1.9 \pm 1.4$ , respectively. The fact indicated no obvious deterioration was found in surgery of high-grade AVMs, in general. However, postoperative neurological deterioration was observed in 9 patients. Four were derived from vascular events (postoperative bleeding: 2, infarction 2) and five were from direct brain injury such as edema or contusion to the corticospinal tract (1), angular gyrus (1), the visual tract (1) and cerebellar nucleus (2). Deteriorations caused by the vascular events were difficult to recover. However, most symptoms derived from direct injury were recovered until mRS reduced less than 2 points.

**Conclusions**

Surgical extirpation for high-grade AVMs with S-M grade III and IV seemed feasible when they were treated after adequate preoperative evaluation of the brain function around the nidus. To obtain better surgical outcome, surgeons should avoid the occurrence of vascular events during the surgery.