Long-term outcomes of patients after resection of brainstem hemangioblastomas
Tongyi Xu¹, Zhifeng Shi¹, Wei Zhu¹, Ying Wang², Ying Mao¹, Liangfu Zhou¹
¹Clinical Center of Neurosurgery, Shanghai Neurosurgical Emergency Center, Department of Neurosurgery, ²Department of Neuropathology, Huashan Hospital, Shanghai Medical College, Fudan University, Shanghai - China

Background: Resection of brainstem hemangioblastomas, especially the solid ones, is associated with a high rate of morbidity and mortality because of the critical neurological functions of the brainstem. However, surgery still remains the definitive treatment for the disease.

Objective: To review the natural history and the long-term outcomes of surgical treatment of hemangioblastomas in the brainstem.

Methods: A retrospective analysis was conducted in 16 consecutive cases of brainstem hemangioblastomas resection in one surgical team of the Neurosurgical Department of Huashan Hospital between 2002 and 2011. Neurological function and MR images were evaluated preoperation, at discharge, 3 month after operation and every 1 year thereafter. All the patients enrolled for this study have only one tumor in brainstem which was verified by surgery and pathology without von Hippel-Lindau disease.

Results: The study population included 7 males and 9 females. The patients were aged from 14 to 62 years with an average age of 32.75 years. There were 12 solid tumors and 4 cystic tumors. Tumors were located on pons (6), ponto-oblengata (4), oblongata (4), cervicomedulla (2). Tumors had a small size in 10 (≤ 3 cm), large in 4 (3.1-4 cm), and giant in 2 (> 4 cm). The most common presenting symptom are gait difficulties, sensory abnormalities, headache, swallow difficulties, blurred vision, singultus. Three patients experienced hemorrhage which was observed by MRI before surgery. Preoperative embolization was performed in 6 cases. Complete tumor resection was achieved in 15 patients. The mean follow-up was 23.5 months(range 1-66 months). One patient with solid tumor died after operation. 9 patients remained at their preoperation functional status, 5 patients got improved and 2 patients got worsen after operation by Karnofsky Scale. 7 patients who experienced new neurological deficits (3 in decreased muscle strength, 2 in epilepsy, 1 in ataxia and 1 in anesthesia of some limbs) after surgery. Two boys(age 14 and 16) experienced a symptom such as congenital central hypoventilation syndrome(CCHS) after operation and one has improved 6 months after operation. No permanent new neurological deficits was observed. All the new emerging neurological deficits have got recovery at 1 year follow-up. 8 patients have overall recovery from the neurological symptoms which was suffered before operation and 2 patients who got worsen after operation have improved to the functional status before operation by last follow-up(mean 23.5 months).

Conclusion: Surgery still remains the preferred treatment for patients with brainstem hemangioblastomas. Excellent outcome can be achieved for the patients with cystic lesion than solid tumors, preoperation embolization and microsurgery technique is helpful to get total resection with minimal mortality and morbidity. But the large tumors still constitute a treatment challenge for the neurosurgical community.