

## INTRAOPERATIVE VENTRICULAR SHUNTING IN THE MIDLINE DEEP-SEATED BRAIN TUMOR SURGERY

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**Objectives:** Surgical resection of deep-seated midline tumors often does not resolve obstruction of cerebrospinal fluid pathways and thus additional operation - ventricular shunting is required. To prevent postsurgical hydrocephalus we combine two different types of surgical interventions performed simultaneously – tumor removal and intra-operative internal ventricular shunting.

**Patients and methods:** Eighty-two patients with deep-seated midline brain tumors underwent 84 operations – tumor removal with simultaneous intraoperative internal ventricular shunting in the Burdenko Neurosurgery Institute from June 2000 until October 2006. This series includes patients with malignant as well as benign tumors with an infiltrative growth pattern mainly of glial origin. Forty six tumors were located in pineal region, 18- in midbrain, 10- in thalamus, 3- in thalamus and midbrain, 3- in the third ventricle, 4- other locations. We performed two types of intraoperative shunting – 1) third ventriculostomy by fenestration of the premamillary membrane of the third ventricle floor and Lilliequist's membrane – 53 operations, and 2) aqueductal stenting – 30 opera-

tions. All operations were performed under microscope without endoscopic technique.

**Results:** Subtotal and partial tumor removal was performed in the majority of patients - 45% and 20%, respectively, what was related to the diffuse pattern of tumor growth. There were no fatal outcome. Repeated shunting due to inadequate function of stoma or stent was performed in 10 cases in the early post-surgical period (up to 30 days) and in 4 cases - in the follow-up period (median 21 month). Efficacy of intraoperative ventriculostomy and stenting comprised 75% and 97% respectively in the early period, and 89% in the follow-up period in each group. Diabetes insipidus, as a sequence of surgical manipulation in the diencephalic-hypothalamic region was revealed in 4 cases (7%), in 3 of them it was transient. Aqueductal stenting did not aggravate eye movement disorders in comparison with the control group.

**Conclusion:** Intraoperative ventriculostomy of the third ventricle and aqueductal stenting under direct visual control are considered effective methods of treatment of obstructive hydrocephalus in deep-seated midline brain tumors.