

PP46

Modern neurosurgical techniques for deep seated brain lesions management in children

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Introduction: Lesions located in deep brain structures such as hypothalamus, and brainstem are typically a challenge for a neurosurgeon due to far and complex approach and proximity of vital neural structures. We report two cases of successful surgical treatment of such lesions in children.

Materials and Methods: The first case is 11-year old female. Being otherwise healthy she suffered from sudden onset vertigo and ataxia. MRI revealed irregular-shaped, gadolinium-enhancing tumor in the right side of the pons and the right upper cerebellar peduncle. She was operated in seated position through subtentorial supracerebellar approach, with assistance of ultrasonic destructor-aspirator. The tumor was removed totally to its visual and navigational border.

The second case is 5-year old girl with recurrent seizures of different types (both focal and secondarily generalized), 6-8 times a day, uncontrollable with multiple antiepileptic drugs. MRI revealed large oval-shaped lesion in the left mamillary body, non-enhancing with gadolinium. EEG shown epileptic focus deep in the left hemisphere. She was operated through anterior transcallosal approach and tumor was totally removed with assistance of ultrasonic destructor-aspirator.

Results: The first patient had moderate cerebellar symptoms and disfunction of the right parietal and occipital lobes, confirmed by neurophysiologic and neuropsychological testing during early post-operative period. All the symptoms regressed after a month. Histological diagnosis was grade III astrocytoma. After surgery she was referred for the adjuvant treatment.

The second patient sustained no additional neurological deficit. After surgery she became totally seizure-free on a single drug (valproate). Post-op EEG revealed no epileptiform activity. Histological diagnosis was hamartoma.

Conclusion: Utilization of modern neurosurgical techniques such as neurophysiologic monitoring, endoscopic assistance and ultrasonic destruction makes surgical treatment of deep seated brain lesions in children feasible and safe with good outcomes.