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Resective surgery in thalamic tumors in children

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Introduction: In the past, surgical outcome of thalamic tumor was poor. They often were considered inoperable. However, contemporary microsurgical techniques, together with improvements in neuroimaging that enable an accurate pre-surgical planning, allow resection in a safer way.

Methods: We reviewed the medical records, imaging studies, operative and pathology reports obtained in pediatric patients, treated at our department for thalamic tumors. All patients, except a patient harbouring a bilateral tumor, underwent surgical treatment with attempt to radical tumor resection. Neuronavigation and intra-operative monitoring of Motor and Somatosensory evoked potentials were used. In some cases with associated hydrocephalus, perioperative ventriculostomy or EVD were performed. Various surgical approaches (anterior interhemispheric transcallosal, posterior interhemispheric parasplenial, middle temporal gyrus (MTG), posterior interhemispheric transtentorial and subtemporal) were used. Postoperatively, an MRI performed within 24 hours was used to assess the extent of tumor resection as partial (< 90%), subtotal (> 90%), or total.

Results: Since 2002, 17 children with thalamic tumors were treated at our department. There were 5 patients with unilateral thalamic tumors, 11 patients with thalamopeduncular tumors and 1 patient with a bilateral tumor. Twentyfour surgical procedures were performed in our 17 patients. The tumors were operated through a middle temporal gyrus approach in 7 patients and an interhemispheric transcallosal approach in 6 patients; a subtemporal approach was used in one patient, a posterior interhemispheric transtentorial approach in another and a combined posterior transcallosal parasplenial approach with posterior interhemispheric transtentorial approach in another patient. In the case of thalamic tumor with bilateral presentation an endoscopic biopsy plus a septostomy and an endoscope-guided placement of a ventriculoperitoneal shunt was performed. At the end of the surgical phase from 16 patients, 11 achieved a GTR, 2 achieved a NTR and 3 (Three patients with initial NTR/PR achieved a GTR in a subsequent surgery, as part of a planned multimodal treatment). The histological results of our 17 patients showed 8 pilocytic astrocytomas, 3 gangliogliomas, 2 diffuse astrocytomas, 2 glioblastomas, 1 anaplastic astrocytoma, and 1 mixed germ cell tumor. One case of ganglioglioma progressed to glioblastoma after 7 years. Overall survival in our series is 13/17. Progression free survival is 12/17.

Conclusion: Our institutional review seems to offer evidence in favor of attempts to radical resection in pediatric patients harbouring unilateral thalamic or thalamo-peduncular tumors.