

Thalamopeduncular glioma

see also [thalamic glioma](#).

Thalamopeduncular tumors arise at the junction of the inferior thalamus and [cerebral peduncle](#) and present with a common clinical syndrome of progressive spastic hemiparesis. Pathologically, these lesions are usually juvenile pilocytic astrocytomas and are best treated with resection with the intent to cure.

Thalamopeduncular gliomas arise at the junction of the [thalamus](#) and [cerebral peduncle](#) and constitute a subgroup of [thalamic gliomas](#). These are surgically challenging lesions because of close proximity to important neural structures including [corticospinal tracts](#) (CSTs) and the [thalamus](#). These tumors usually displace CSTs anterolaterally or extend to the lateral ventricular surface. Such tumors can be removed by either temporal or transventricular approaches. However, if CSTs cover the entire lateral surface of tumor and tumor does not extend to the ventricular surface, temporal and transventricular approaches cannot be used because the trajectories of both approaches would pass through normal eloquent structures (CSTs and thalamus), and consequently there would be a very high risk of postoperative neurologic deficits developing.

Case series

Broadway et al present a retrospective review of their experience with 10 children presenting between 3 and 15 years of age with a [thalamopeduncular syndrome](#). Formal preoperative MR imaging was obtained in all patients, and diffusion tensor (DT) imaging was performed in 9 patients. Postoperative MR imaging was obtained to evaluate the extent of tumor resection. A prospective analysis of clinical outcomes was then conducted by the senior author.

Pilocytic astrocytoma was the pathological diagnosis in 9 cases, and the other was fibrillary astrocytoma. Seven of 9 pilocytic astrocytomas were completely resected. Radical surgery was avoided in 1 child after DT imaging revealed that the corticospinal tract (CST) coursed through the center of the tumor, consistent with the infiltrative nature of fibrillary astrocytoma as identified by stereotactic biopsy. In 8 patients, tractography served as an important adjunct for designing a surgical approach that spared the CST. In 6 cases the CSTs were pushed anterolaterally, making a transsylvian approach a poor choice, as was evidenced by the first patient in the series, who underwent operation prior to the advent of tractography, and who awoke with a dense contralateral hemiparesis. Thus, subsequent patients with this deviation pattern underwent a transcortical approach via the middle temporal gyrus. One patient exhibited medial deviation of the tracts and another had lateral deviation, facilitating a transtemporal and a transfrontal approach, respectively.

The thalamopeduncular syndrome of progressive spastic hemiparesis presenting in children with or without symptoms of headache should alert the examiner to the possibility of a tumoral involvement of CSTs. Preoperative tractography is a useful adjunct to surgical planning in tumors that displace motor pathways. Gross-total resection of pilocytic astrocytomas usually results in cure, and therefore should be entertained when developing a treatment strategy for thalamopeduncular tumors of childhood ¹⁾.

Case reports

A 50-year-old woman presented with contralateral hemiparesis. Radiologic evaluation revealed a right Thalamopeduncular glioma that displaced CSTs laterally and was covered by normal thalamus superiorly. Some CST fibers passed through the tumor. Because both lateral and superior surfaces were covered by eloquent structures, we used an anterior interhemispheric transparaterminal gyrus approach to access the tumor successfully and achieved subtotal excision. The patient had transient neurologic deterioration postoperatively that recovered to preoperative level within 2 weeks.

The anterior interhemispheric transparaterminal gyrus approach has not been described previously for accessing brainstem lesions. This approach can be used to access tumors of the cerebral peduncle that displace CSTs laterally and are covered by normal thalamus superiorly. The anterior interhemispheric transparaterminal gyrus approach adds to the armamentarium of neurosurgeons for treatment of cerebral peduncular lesions ²⁾.

¹⁾

Broadway SJ, Ogg RJ, Scoggins MA, Sanford R, Patay Z, Boop FA. Surgical management of tumors producing the thalamopeduncular syndrome of childhood. J Neurosurg Pediatr. 2011 Jun;7(6):589-95. doi: 10.3171/2011.4.PEDS119. PubMed PMID: 21631193; PubMed Central PMCID: PMC3531960.

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Kumar A, Sharma R, Garg A, Sharma BS. Contralateral Anterior Interhemispheric Transparaterminal Gyrus Approach for Thalamopeduncular Pilocytic Astrocytoma in an Adult: Technical Report. World Neurosurg. 2016 Mar;87:21-5. doi: 10.1016/j.wneu.2015.09.021. Epub 2015 Sep 25. PubMed PMID: 26409092.

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