Supracerebellar transtentorial approach (SCTT)

see also Paramedian supracerebellar transtentorial approach.

The supracerebellar transtentorial approach to the ventricular atrium provides a minimally invasive corridor by traversing the medially located collateral sulcus, while minimizing cortical disruption by virtue of the sulcus’ anatomical proximity to the ventricular atrium.

With proper head positioning, this approach may involve minimal retraction of the cerebellum and the occipital lobe.

When compared with other conventional approaches to the atrium that involve various degrees of violation of eloquent cortex, this approach may result in a decreased incidence of postoperative deficits.

The rationale for using the collateral sulcus as a distinct entry plane stems from it being the most consistent landmark on the basal occipito temporal lobe.

In addition, the collateral sulcus has been shown to be the deepest of the sulci on the occipitobasal surface, thus bringing the surgeon relatively closer to the ventricle, when compared with a transgyral approach.

**Indications**

**Medial Temporo-occipital Lesions**

Operations on tumors of the posteromedial temporal region, are challenging to perform because of the deep-seated location of these tumors between critical cisternal neurovascular structures and the adjacent temporal and occipital cortexes.

Traditional surgical approaches require temporal or occipital transgression, retraction, or venous sacrifice. These approaches may result in unintended complications that should be avoided. To avoid these complications, the supracerebellar-transtentorial (SCTT) approach to this region has been used as an effective alternative treatment in adult patients. The SCTT approach uses a sitting position that offers a direct route to the posterior fusiform gyrus and lingual gyrus of the temporal lobe. May be an effective alternative approach to lesions located in the medioposterior aspect of the atrium of the lateral ventricle in selected cases.

It is a safe alternative to resect lesions in the posteromedial temporal region (PMT) region in adults, but only 4 uses of this method have been previously reported on in pediatric patients.

The SCTT approach offers an alternative route to the PMT region, while avoiding the risks of injury to the superficial venous drainage of the temporal lobe and of injuries associated with temporal lobe retraction or with transgression through normal brain tissue. Thus, the SCTT approach may reduce the risk of producing surgery-related neurological deficits.

**Lesions in relative proximity to the tentorium**

To reduce these risks, the microscopic supracerebellar transtentorial approach with the patient in the sitting position has been previously described for lesions in relative proximity to the tentorium.
Supracerebellar transtentorial approach technique.

Prospective multicenter studies

A prospective multicenter study was designed to collect data on patients undergoing an endoscopic-enhanced SCTT approach to excise left Mesial temporal lobe lesions. The study involved 5 different neurosurgical European centers and ran from 2015 to 2020. All patients had preoperative as well as the postoperative brain MRI and ophthalmic evaluation. A total of 30 patients were included in this study, the mean follow-up was 44 months (range 18 to 84 months), the male/female ratio was 16/14, and the mean age was 39 years. A gross total resection was achieved in 29/30 (96.7%) cases. All surgical procedures were uneventful, without transient or permanent neurological deficits thanks to the preservation of the posterior cerebral artery. The endoscopic-enhanced SCTT approach provides satisfactory exposure to the left temporo-mesial region. Its minimally invasive nature helps minimize the surgical risks related to vascular and white tract manipulation, which represent known limitations of open microsurgical as well as other approaches.

Case series

2015

Four consecutive patients harboring a medial temporo-occipital lesion are reported. All were operated on while in the sitting position using frameless navigation and a supracerebellar transtentorial approach. Tumor resection was performed by 2 surgeons with endoscopic visualization.

Pathologies included intraparenchymal metastatic melanoma, cavernous hemangioma, and ganglioglioma, as well as an intraventricular metastatic tumor. The distance from the tentorium to the lesion ranged from 1 to 4 mm. Gross total resection was achieved in 3 of the 4 patients. The patient with a metastatic melanoma had an intentional near-total resection given the tumor encasing a branch of the posterior cerebral artery. The patient with the intraventricular tumor sustained a small but symptomatic infarct of the lateral geniculate region, resulting in a visual field deficit.

This small series suggests that the endoscopic supracerebellar transtentorial approach with the patient in the sitting position can be a safe and effective approach for removing medial temporo-occipital lesions. It allows excellent tumor visualization, eliminates the need for brain retraction, minimizes parenchymal transgression, and improves surgical ergonomics. Significant experience in endoscopy and excellent neuroanesthesia support are recommended before undertaking this approach.

5 consecutive patients undergoing a paramedian SCTT approach between 2009 and 2014 in the park bench position was used in 3 boys and 2 girls with a mean age of 7.8 years (range 13 months to 16 years). All patients presented with a seizure disorder related to a tumor in a PMT region involving the parahippocampal gyrus and fusiform gyrus of the left (n = 3) or right (n = 2) temporal lobe. No procedure-related complications were observed. Gross total resection and control of seizures were achieved in all cases. Tumor classes and types included 1 Grade II astrocytoma, 1 pleomorphic xanthoastrocytoma, 1 gangliogioma, and 2 glioneural tumors. None of the tumors had recurred by
the mean follow-up of 22 months (range 1-48 months). Outcomes of epileptic seizures were excellent, with seizure symptoms in all 5 patients scoring in Engel Class IA.

The SCTT approach represents a viable option when resecting tumors in this region, providing a reasonable working corridor and low morbidity. The authors' experience in a cohort of pediatric patients demonstrates that complete resection of the lesions in this location is feasible and is safe when involving an approach that involves using a park-bench lateral positioning.\(^{17}\)

**Case reports**

A 40-year-old patient was admitted with a 9-month history of headaches and multiple episodes of generalized seizures. Investigations revealed a medial temporal epidermoid tumor that extended into the suprasellar region. The tumor was surgically resected using a lateral supracerebellar-transtentorial approach. The rationale for the surgical approach and its validity in this clinical situation is discussed.\(^{18}\)

**Videos**


---


Jittapiromsak P, Deshmukh P, Nakaji P, Spetzler RF, Preul MC: Comparative analysis of posterior
approaches to the medial temporal region: supracerebellar transtentorial versus occipital transtentorial. Neurosurgery 64 (3 Suppl):ons35–ons43, 2009


