Left Transsylvian Transcisternal and Transinferior Insular Sulcus Approach for Resection of Uncohippocampal Tumor: 3-Dimensional Operative Video

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The medial temporal lobe can be divided in anterior, middle, and posterior segments. The anterior segment is formed by the uncus and hippocampal head, and it has extra and intraventricular structures. There are 2 main approaches to the uncohippocampal region, the anteromedial temporal lobectomy (Spencer’s technique) and the transsylvian selective amygdalohippocampectomy (Yasargil’s technique).

In this video, we present the case of a 29-yr-old man with new onset of generalized seizures and a contrast-enhancing lesion in the left anterior segment of the medial temporal lobe compatible with high-grade glioma. He had a medical history of cervical astrocytoma at age 8 requiring craniospinal radiation therapy and ventriculoperitoneal shunt placement.

The tumor was approached using a combined transsylvian transcisternal and transinferior insular sulcus approach to the extra and intraventricular aspects of the uncohippocampal region. It was resected completely, and the patient was neurologically intact after resection with no further seizures at 6-mo follow-up. The diagnosis was glioblastoma IDH-wild type, for which he underwent adjuvant therapy.

Surgical anatomy and technical nuances of this approach are illustrated using a 3-dimensional video and anatomic dissections. The selective approach, when compared to an anteromedial temporal lobectomy, has the advantage of preserving the anterolateral temporal cortex, which is particularly relevant in dominant-hemisphere lesions, and the related fiber tracts, including the inferior fronto-occipital and inferior longitudinal fascicles, and most of the optic radiation fibers. The transsylvian approach, however, is technically and anatomically more challenging and potentially carries a higher risk of vascular injury and vasospasm.


Disclosure
The author has no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.
COMMENTS

This case and approach description is a useful addition to the literature, showing the transsylvian approach to an uncohippocampal tumor. The audio, video, and narrative descriptions are clear. This approach shows the relevant anatomy of a complex 3-dimensional space, with critical bypassing arteries and neural structures.

Whether one removes these lesions in a transcortical, subpial manner, using regional landmarks, or approaches them in the transsylvian exposure, the rules remain the same. Clear identification of the neurovascular anatomy is essential, as is an understanding of the limits of resection—the crural cistern, anterior perforated substance, optic tract, the anterior choroidal artery, and the mammillary perforating arteries of the posterior communicating artery. This video demonstrates these limits well.

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This manuscript and video demonstrate a great direct way to address tumors in the mesial temporal lobe without sacrificing the lateral structures of the temporal lobe. Furthermore, it does not affect the connective white matter of the temporal peduncle and it does not require the opening of the lateral ventricle. One must be aware that this approach also has risks. The main downside of approaching the mesial temporal lobe using this method is the fact that there will be manipulation of the middle cerebral artery and its branches. For that reason, there is a small chance of vasospasm and stroke to the left hemisphere. Approaching the uncus through the cistern also brings the risk of third nerve palsies. Of course, all these risks are diminished when proper technique and meticulous procedure execution is performed as demonstrated by the authors.

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