# Posterior Third Ventricle Tumor approaches

- Outcomes and Surgical Approaches for Pineal Region Tumors in Adults: A Retrospective Study of a Single-Center Over 12 Years
- Endoscopic endonasal pituitary transposition trans-tuber-cinereum for resection of the third ventricle craniopharyngioma
- Transcallosal Retroforniceal Transchoroidal Approach: To the Posterior Third Ventricle and Beyond
- Occipital Interhemispheric Retrocallosal Transtentorial Approach to a Tectal Tumor in an 8-Year-Old Girl: Operative Video
- A 55-Year-Old Woman Presenting with a Second Diagnosis of Craniopharyngioma Following Diagnosis and Successful Treatment of Craniopharyngioma as a 5-Year-Old Child
- Endoscopic endonasal pituitary sacrifice for select tumors with retrochiasmatic and/or retrosellar extension: surgical anatomy, operative technique, and case series
- Anatomical Step-by-Step Dissection of Midline Suboccipital Approaches to the Fourth Ventricle for Trainees: Surgical Anatomy of the Telovelar, Transvermian, and Superior Transvelar Routes, Surgical Principles, and Illustrative Cases
- Endoscopic Supracerebellar Infratentorial Transpineal Approach for Posterior-Medial Thalamic Lesions: Surgical Technique and Clinical Experience

Surgical approaches to posterior third ventricle tumors are challenging due to the deep location of the ventricle within the brain and its proximity to critical structures like the thalamus, hypothalamus, pineal gland, and brainstem. The choice of surgical approach depends on the tumor's size, location, type, and the patient's overall health. Here are some common surgical approaches used for accessing posterior third ventricle tumors:

1. Interhemispheric Transcallosal Approach

Description: This approach involves a craniotomy (opening of the skull) and splitting the corpus callosum, a thick band of nerve fibers that connects the two hemispheres of the brain. It allows direct access to the third ventricle through the midline. Advantages: Provides a direct path to the third ventricle without the need to traverse brain tissue laterally. It avoids major blood vessels and is suitable for tumors located in the anterior and middle portions of the third ventricle. Disadvantages: Potential risk of injury to the corpus callosum, which can affect communication between the brain hemispheres. Also, there is a risk of injuring deep venous structures and causing neurological deficits.

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2. Transcortical Approach

Description: This approach involves making a craniotomy and creating a cortical incision in the brain to access the lateral ventricle, which leads to the third ventricle. Common cortical entry points include the middle frontal gyrus or the superior parietal lobule. Advantages: Offers a shorter route to the third ventricle for tumors located in the lateral or anterior regions. It can be used for larger tumors that extend into the lateral ventricles. Disadvantages: Higher risk of causing cortical damage, leading to neurological deficits such as hemiparesis, aphasia, or visual field defects, depending on the location of the cortical incision. 3. Infratentorial Supracerebellar Approach Description: This approach involves a craniotomy at the back of the head, below the tentorium (a membrane that separates the cerebellum from the occipital lobes). The cerebellum is gently retracted to access the posterior third ventricle through the pineal region. Advantages: Provides a direct view of the posterior third ventricle and is

particularly useful for tumors located in the pineal region or extending posteriorly. Minimizes damage to the cerebral hemispheres. Disadvantages: Requires cerebellar retraction, which can lead to complications like cerebellar mutism or ataxia. There is also a risk of injuring the veins in the pineal region and causing excessive bleeding. 4. Transcallosal-Interforniceal Approach Description: This is a variation of the interhemispheric transcallosal approach, but it involves opening the septum pellucidum and accessing the third ventricle through the space between the two fornices. Advantages: Provides a direct route to the third ventricle with minimal brain retraction. It allows for excellent visualization of the anterior and middle portions of the third ventricle. Disadvantages: Risk of damage to the fornices, which can cause memory disturbances or cognitive deficits. Also, there is a risk of injury to deep venous structures.

5. Occipital Transtentorial Approach Description: This approach involves making a craniotomy in the occipital region (back of the head) and opening the tentorium to reach the third ventricle. It allows the surgeon to approach the ventricle from above and behind. Advantages: Provides good exposure for tumors located in the posterior third ventricle, especially those extending into the pineal region. Avoids damage to the corpus callosum and major blood vessels. Disadvantages: Requires manipulation of occipital lobe structures, which can lead to visual field deficits or other neurological complications. It also involves more brain retraction than some other approaches. Considerations for Choosing a Surgical Approach Tumor Size and Location: The approach chosen often depends on where the tumor is within the third ventricle and how large it is. Tumors located more anteriorly may be better accessed via transcallosal approaches, while posteriorly located tumors may be better suited for infratentorial or occipital approaches.

Patient's Neurological Status and Health: The overall health of the patient, as well as their neurological status, may affect the decision. For example, a less invasive approach may be preferred in patients with significant comorbidities.

Surgeon Experience and Preference: The experience of the neurosurgeon and their familiarity with certain approaches can also play a significant role in the choice of surgery.

Tumor Pathology: Different types of tumors may require different surgical techniques or adjunctive therapies (e.g., radiation or chemotherapy).

Conclusion Surgical approaches to posterior third ventricle tumors must be carefully planned and tailored to each patient's specific condition. Multidisciplinary teams, including neurosurgeons, radiologists, oncologists, and neurologists, often collaborate to determine the best course of action for these complex cases. Early diagnosis and appropriate surgical intervention can significantly impact outcomes and improve the quality of life for patients with posterior third ventricle tumors.

## Endoscopic Approach

see Posterior third ventricle tumor endoscopìc approach.