Left Temporal Lobe Tumor – Surgical Case Report

Patient Background

- **Age/Sex**: 45-year-old female
- **Allergies**: None known
- **Past Medical History**: Non-contributory
- **Current Medications**: None
- **Neurological Exam**: Alert, oriented, no motor or sensory deficits. Normal gait and fluent speech. No signs of increased intracranial pressure.

Clinical Presentation

- Admitted for etiological investigation of a left medial temporal hypodensity on CT, initially suspected to be subacute/chronic ischemia.
- Two witnessed seizure episodes:
  1. First: while working, 2-minute loss of consciousness, head trauma (vertex wound), tonic-clonic movements, no sphincter relaxation, no tongue bite. Postictal state present.
  2. Second: in the emergency room, with disconnection from surroundings and tonic-clonic movements. Duration: ~2 minutes.
- No fever, nausea, vomiting, or systemic complaints.

Imaging Studies

- **MRI Brain**:
  1. Lesion in the left hippocampal-uncal region (20×19×14 mm).
  2. T2/FLAIR hyperintensity with internal cystic areas.
  3. Cortical and subcortical involvement, no restricted diffusion.
  4. No calcification or hemorrhage.
  5. Mild nodular enhancement inferiorly (3–4 mm).
  6. ↓CBV even in non-enhancing component.
  7. **MR Spectroscopy**: ↓NAA, ↑myo-inositol. (NAA/Cr: 1.28; Cho/Cr: 1.0)
  8. Impression: Low-grade mixed neuronal-glial tumor. DDx includes ganglioglioma, papillary glioneuronal tumor, less likely DNET.

Surgical Indication

- **Indication**: Amygdalar lesion with epileptic seizures
- **Goal**: Maximal safe resection for histopathological diagnosis and seizure control

Surgical Plan

- **Position**: Supine, head fixed in Mayfield, rotated right

- **Intraoperative Monitoring**: Electrocorticography (ECoG)
- **Approach**: Left interfascial dissection and pterional craniotomy
- **Equipment**: Microscope, CUSA Clarity, intraoperative ultrasound, Yasargil retractor hooks

Surgical Technique

- Curvilinear skin incision from tragus to midline, behind the hairline
- Interfascial dissection preserving facial nerve frontal branches
- Two burr holes (basal and posterior), gentle dural dissection
- Craniotomy exposing temporal pole and anterior Sylvian fissure
- Extensive sphenoid wing drilling for anterior temporal access
- Dural opening reflected anteriorly
- Epidural ultrasound guidance
- Placement of ECoG electrode mat
- Dissection of Sylvian fissure from distal to proximal using sharp arachnoid dissection
- Exposure of temporal planum
- **Transplanum-polar subpial dissection** toward the amygdala
- Tumor debulking with CUSA
- **Tumor in close proximity to**:
    1. IFOF (displaced superiorly)
    2. Uncinate fasciculus
    3. Anterior choroidal artery (medial border)
    4. MCA branches and posterior communicating artery
- Resection advanced until:
    1. Exposure of anterior choroidal artery
    2. Visualization of PComA and temporal horn
- Extreme caution near lenticulostriate arteries
- **Intraoperative and final biopsy** samples sent
- Intraoperative ultrasound for resection control
- Hemostasis achieved with bipolar and hemostatic agents
- Subdural Surgicel®
- Primary dural closure
- Epidural hemostatic packing
- Cranial bone flap fixed with titanium plates
- Layered closure (Vicryl + staples)
- Betadine gauze dressing with monofilament suture

Postoperative Management

- Early MRI (within 72h) to evaluate resection extent
- Monitor for seizure activity
- Neuropsychological assessment (memory/language)

Anticipated Complications to Avoid

- Surgical site infection
- Wound dehiscence

- CSF leak
- Injury to Sylvian veins or MCA branches
- Epidural or subdural hematoma
- Seizures
- Temporal lobe edema
- Language or memory deficits

Critical Review 1. Diagnostic Strategy and Clinical Framing Strengths:

The presentation is consistent with a symptomatic temporal lobe lesion: new-onset focal epilepsy in an adult with imaging evidence of a medial temporal mass.

MRI with advanced techniques (MR spectroscopy, perfusion) was correctly used to characterize the lesion, supporting the hypothesis of a low-grade, mixed neuronal-glial tumor (ganglioglioma vs. papillary ganglioglioneuronal tumor).

Seizure semiology supports medial temporal lobe involvement, reinforcing the surgical indication.

Points of Critique:

The initial hypothesis of “subacute/chronic ischemia” is questionable given the topography (hippocampal-uncal), size, mass effect, and cystic components—features not typical for chronic infarct. This framing could have delayed appropriate referral.

There is no mention of EEG findings (interictal or ictal), which would have strengthened the surgical rationale, especially in a presumed lesional epilepsy setting. While imaging may suffice in clear cases, EEG helps assess epileptogenicity and guides resection margins.

Neuropsychological baseline was not documented preoperatively, despite the location being highly eloquent (dominant medial temporal lobe). This could limit postoperative interpretability of cognitive outcomes.

2. Surgical Planning and Technical Execution Strengths:

The surgical approach—left interfascial pterional craniotomy with transplanum subpial access—is appropriate for anteromedial temporal lesions involving the amygdala and uncus, especially when hippocampus preservation is intended.

The dissection was anatomically precise, navigating critical tracts (IFOF, uncinate fasciculus) and vascular structures (AChA, MCA, PComA).

Use of intraoperative ultrasound, electrocorticography, and CUSA reflects a modern, well-equipped operating setup.

Craniotomy design (limited frontal extension) is conservative and functionally thoughtful.

Points of Critique:

While a “maximal safe resection” was the stated goal, no intraoperative neuro-navigation or mapping of language/memory areas is mentioned. Given the dominance of the left temporal lobe, this could be a significant omission if not addressed.

The decision to spare the hippocampus is not explicitly justified. In lesional epilepsy surgery, especially with amygdalar tumors, incomplete resections often lead to persistent seizures unless the hippocampus is also epileptogenic (a fact ideally confirmed by EEG or stereo-EEG).

The use of ECoG is commendable, but the report does not specify if any intraoperative spikes were seen after tumor removal, nor whether the resection was adjusted accordingly. This limits evaluation of seizure control likelihood.

3. Risk Management and Anticipated Complications Strengths:

Complication awareness is solid, with attention to vascular injury, CSF leaks, infection, and cognitive consequences.

Hemostasis technique is sound and closure strategy is standard.

Points of Critique:

There's no mention of postoperative seizure prophylaxis strategy (e.g., antiseizure medications), which is important in epilepsy surgery follow-up.

The cognitive risk is acknowledged, but no mitigation strategy is described (e.g., dominant hemisphere mapping, staged procedures, or hippocampal electrocorticography).

4. Overall Evaluation and Recommendations Global Assessment: This is a well-indicated surgery with solid anatomical execution and appropriate intraoperative technology. The surgical route is safe and conservative, aimed at minimizing morbidity.

However, from a critical standpoint:

The preoperative functional assessment (EEG, neuropsychology) is underdeveloped, which is concerning in dominant temporal lobe cases.

The oncologic-versus-epileptologic balance is not fully addressed: Should the hippocampus have been resected to optimize seizure control? Was oncologic radicality or functional preservation the higher priority?

There is no plan for long-term seizure follow-up, tumor recurrence monitoring, or neurocognitive rehabilitation, which are essential in a low-grade tumor of the temporal lobe with epileptogenic activity.

Conclusion While the technical aspects of this case are well executed, the case would benefit from a more integrated functional workup and clearer surgical strategy balancing oncologic resection with seizure control. For future cases, inclusion of EEG, memory/language mapping, and interdisciplinary epilepsy board discussion would strengthen surgical planning, particularly for dominant hemisphere tumors.