Supramarginal Resection

Supramarginal vs. Supramaximal Resection

While often used interchangeably, these two terms can reflect different levels of surgical ambition:

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^ Term                    ^ Definition
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| **Supramarginal**        | Resection of tumor plus a margin of surrounding
brain tissue just beyond imaging abnormalities. |
| **Supramaximal**         | More extensive resection, potentially involving
entire brain regions or functional networks.    |
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In practice, the choice depends on tumor location, patient function, and surgeon philosophy.

Supramarginal resection is a surgical approach that goes beyond the radiologically visible boundaries of a brain tumor. Its goal is to remove not only the tumor as seen on imaging—typically on MRI—but also an extra margin of surrounding brain tissue that might contain microscopic tumor cell infiltration.

Clinical Context

* **Primary Use:**

1. Most commonly in diffuse gliomas (both low- and high-grade, including glioblastoma).
2. Sometimes applied in brain metastases when there is suspected infiltrative growth.

* **Rationale:** By removing adjacent tissue that appears healthy but might harbor tumor cells, this technique aims to:

1. Improve overall and progression-free survival.
2. Decrease the risk of local recurrence.
3. Enhance the efficacy of adjuvant treatments such as radiation and chemotherapy.

Comparison of Resection Types

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^ Type of Resection          ^ Description
^
| **Biopsy**                 | A small tissue sample is taken for diagnostic
purposes.                          |
| **Subtotal resection**     | Only part of the visible tumor is removed.
|
| **Gross Total Resection**  | All of the radiologically visible tumor is
excised.                           |
| **Supramarginal Resection**| The entire tumor as well as an additional
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margin of adjacent tissue is removed.    |
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Key Enabling Factors

* **Intraoperative Brain Mapping:** Utilized especially for tumors near or within eloquent areas of the brain to preserve function.

* **Neurophysiological Monitoring:** Monitoring motor, sensory, and language functions during surgery helps minimize postoperative deficits.

* **Awake Craniotomy:** Often performed when tumors are located in functionally critical regions to allow for continuous patient feedback during surgery.

* **Intraoperative Imaging Tools:** Use of MRI, ultrasound, or fluorescence agents (such as 5-ALA) assists in identifying the tumor borders and infiltrative areas.

Summary

Supramarginal resection represents a nuanced balance between achieving maximal tumor removal while preserving neurological function. Its application is tailored to individual cases based on tumor type, location, and the potential benefits weighed against the risks of removing additional brain tissue.