Insular Glioma Systematic Reviews and Meta-analysis

- Prognostic Factors and Resectability Predictors in Insular Gliomas: A Systematic Review
- Seizure outcome after resection of insular glioma: a systematic review, meta-analysis, and institutional experience
- Post-operative morbidity ensuing surgery for insular gliomas: a systematic review and meta-analysis
- Updated incidence of neurological deficits following insular glioma resection: A systematic review and meta-analysis
- Association Between IDH1 and IDH2 Mutations and Preoperative Seizures in Patients with Low-Grade Versus High-Grade Glioma: A Systematic Review and Meta-Analysis

A Systematic Review and Meta-analysis of Matthias Simon et al., estimated rates of motor and speech deficits epilepsy control, KPI, and functional outcomes, surgical approaches and intraoperative strategies, gaps and open research questions

Methodology

- Literature search and inclusion criteria were clearly defined.
- Pooled data using a **random-effects model**.
- PRISMA flowchart included in the full text.

Strengths:

- Solid meta-analytic approach
- Wide timespan and adequate sample size

Limitations:

- No formal risk-of-bias assessment reported
- Lack of subgroup analyses by tumor grade or patient characteristics

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Main Results

- **Motor deficits**: 6.8%
- **Speech deficits**: 3.6%
- **Postoperative epilepsy control**: 79.6%
- **KPI ≥ 80**: 83.5%

Technical Insights:

- **Awake surgery**: Slightly better functional outcome, but possibly less extent of resection
- **Transcortical approach**: Fewer motor deficits than transsylvian

Limitations:

- Pooled results do not reflect institutional variability
- Lack of detail on long-term seizure outcome (e.g., Engel class)

Discussion and Interpretation

- Risks and complication rates are comparable to other neuro-oncological procedures.
- Mapping and monitoring are **recommended**, ideally in experienced hands.

Criticisms:

- Underrepresents the steep insular glioma surgery learning curve and required surgical expertise
- No GRADE assessment of evidence
- Brief treatment of **insular glioblastomas**

Literature Gaps Identified

- Absence of standardized functional outcome reporting
- Poorly defined classification systems (Yasargil vs. Berger-Sanai vs. Duffau)
- Limited evidence on high-grade (GBM) surgery in insula

Final Assessment

Category	Assessment
Study Type	Systematic Review + Meta-analysis
Methodological Rigor	High (PRISMA, random-effects model)
Heterogeneity Handling	Moderate (no deep stratification)
Clinical Applicability	High for experienced centers
Addresses Gaps?	Partially
Overall Value	(4/5)

Recommendations

- Highly valuable reference for experienced neuro-oncology teams.
- Not generalizable to centers with limited awake surgery capacity.
- Future work should focus on:
    - Standardized outcomes
    - Prospective multicenter registries
    - Better classification of insular gliomas and their growth patterns

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Simon M, Hagemann A, Gajadin S, Signorelli F, Vincent AJPE; EANS Neuro-oncology Section. Surgical treatment for insular gliomas. A systematic review and meta-analysis on behalf of the EANS neuro-oncology section. Brain Spine. 2024 May 15;4:102828. doi: 10.1016/j.bas.2024.102828. PMID: 38859917; PMCID: PMC11163152.