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**Original Investigation** | Neurology

# Comparative study of SWS post-Operative Seizure outcomes on Hemispherectomy and Focal Lesionectomy Surgical Approach

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## Key Points

**Question:**
How do post-operative seizure outcomes compare between hemispherectomy and focal lesionectomy in patients with Sturge-Weber Syndrome (SWS)? Which surgical approach offers better seizure control?

**Findings:**
A systematic review of 8 studies covering 348 patients with a median age of 2 years was conducted.
Hemispherectomy (56.3% of patients)
Focal Lesionectomy (43.68% of patients)
6.57%Hemispherectomy showed superior seizure outcomes, with a higher percentage of seizure-free patients compared to focal lesionectomy.

**Meaning:**
Hemispherectomy appears to provide better seizure control for patients with SWS.
Surgical decisions should be individualized based on the patient's condition and the extent of brain involvement.
Further research is needed to explore the long-term cognitive and motor outcomes of these surgical interventions.

## Abstract

**Importance:**
Sturge-Weber Syndrome (SWS) is a rare cognitive disorder characterized by prominent and challenging seizures that commonly present in infancy. Seizures in SWS show considerable variation as per clinical outcomes as the extent of cerebral involvement and the age of seizure onset. Some patients with SWS are not able to control by medicine, in such cases patients should go for surgeries like Focal lesionectomy or Hemispherectomy to enhance better seizure outcome.

**Aim**
The study aims to provide a systemic review of the seizure outcomes of the patients who underwent hemispherectomy and Focal lesionectomy surgery for Sturge-Weber Syndrome.

**Methods**
A systematic review was performed using articles focusing on outcomes of seizures post-operation from PubMed, Elsevier, and Neurology journals published between 2020-2024.

**Results**
After analyzing 20 studies related to surgical therapy of SWS, we applied inclusion and exclusion criteria and narrowed down to 8 articles which covered 348 patients of median age 2.0 (interquartile range 1.2-4.6) years in this study. Among those patients, 56.3%(n=196) underwent hemispherectomy and 43.68%(n=152) patients had Focal lesionectomy. According to the Engel Classification (EC), for patients who had Hemispherectomy, the post-operative seizure outcomes revealed that 81.12% patients were categorized as ECI, 10.7% as ECII, 5.1% as ECIII and 3.06% as ECIV. Patients who underwent Focal lesionectomy, the post-operative seizure outcomes showed that 71.05% patients were classified under ECI, 17.05% as ECII, 5.26% as ECIII and 6.57% as ECIV.

**Conclusion**
Based on the analysis with the data available Hemispherectomy has better post operative seizure outcomes compared to Focal lesionectomy for patients diagnosed with SWS. Even then surgical therapy can be applied on case-to-case basis depending on patient's condition and the nature of affected area in the brain. However, further studies are essential to develop deep knowledge on cognitive and motor outcomes in patients with SWS post-surgery as very limited references are available presently.

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