Stereoelectroencephalography History

- Epileptogenicity post stereoelectroencephalography and subdural grids invasive monitoring: A retrospective analysis of adult and pediatric patients with refractory epilepsy
- Comparison of children and adults undergoing subdural grid electrode implantation or stereoelectroencephalography in a refractory epilepsy cohort from four European centers
- Stereo-electroencephalography in the setting of a preexisting deep brain stimulation device: illustrative case
- Insights from stereoelectroencephalography in KCNT1-related focal epilepsy suggest a multifocal and migrating epileptogenic network
- Resolution of bilateral temporal lobe epilepsy via minimally invasive stereoelectroencephalogram-guided asymmetric radiofrequency thermocoagulation: a case report
- Stereo-electroencephalography pattern and long-term seizure outcome in hypothalamic hamartoma treated by radiofrequency thermocoagulation
- Mapping Cognition in Epilepsy: From the Lab to the Clinic
- Surgical treatment of long-term epilepsy-associated tumors guided by stereoelectroencephalography

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Stereoelectroencephalography (SEEG) was originally developed by Jean Talairach and Bancaud.

Many SEEG depth electrode implantation techniques involve the use of extensive technological equipment and shaving of the patient's entire head before electrode implantation [1)].

Electrocortical stimulation mapping (ESM) is often performed in patients undergoing stereoelectroencephalography (SEEG) prior to epilepsy surgery, with the goal of identifying functional cortex and preserving it postoperatively. ESM may also evoke a patient's typical seizure semiology. The purpose of a study of Bank et al. was to determine whether the sites at which typical auras are evoked during ESM are associated with other known clinical and electrophysiologic biomarkers of the epileptogenic zone: the seizure onset zone (SOZ), the early spread zone (ES), and high-frequency oscillations (HFOs). They found that the sites at which auras were provoked were not consistently associated with known biomarkers ($p = 0.09$). They conclude that evoked auras during ESM may reflect electrical spread rather than true epileptogenicity, and that a larger study is needed to assess their potential value as independent epileptic biomarkers [2)].

Institutional procedural overviews

In an Institutional procedural overview Cristina Filipescu et al. from Sainte-Anne Hospital, Paris published in Clinical Neurophysiology to describe the current SEEG protocol and clinical workflow at Sainte-Anne Hospital for patients with focal drug-resistant epilepsy, contextualized with a historical overview and emphasis on evolving practices. While foundational SEEG practices remain intact, significant technical evolution has occurred, notably in imaging, electrode implantation, and data

quantification, reinforcing Sainte-Anne's legacy and continued innovation in SEEG methodology [3].

Content Accuracy and Depth:

This article reads more as a retrospective institutional procedural digest than a scientific study. It suffers from an acute lack of quantitative data, outcome metrics, or cohort descriptions. Nowhere do the authors present patient numbers, seizure outcomes, complication rates, or comparative efficacy. The tone is heavily descriptive and offers little evaluative critique of their own methods. The historical framing is well-placed given Sainte-Anne's legacy in SEEG, but the article leans too heavily on nostalgia rather than substantive innovation. There is no reference to contemporary comparative data or benchmarking against global standards (e.g., Milan, Cleveland Clinic, Montreal).

Structure and Clarity:

The article flows in a roughly chronological format—history, non-invasive phase, invasive phase—but transitions are poorly defined. Dense lists of evolving techniques (robotics, fMRI, PET, etc.) are thrown in without proper contextual anchoring or supporting visuals/figures. The absence of any illustrative diagrams or surgical planning workflows is a glaring omission in what should be a procedure-heavy technical piece. Terminology such as "amitriptyline and benzodiazepine tests" is dropped without explanation or citation, limiting utility for non-French readers unfamiliar with local protocols.

Utility to Neurosurgeons:

From a pragmatic perspective, the piece is of limited use. Practicing neurosurgeons looking to replicate or refine SEEG workflows will find no algorithms, implantation criteria, electrode planning schemas, or real-world technical troubleshooting. The claim of evolution is repeated but never operationalized into transferable knowledge. As a procedural reflection from a historic center, it has mild archival value; as a practical guide, it fails entirely.

Tone and Scholarly Rigor:

The tone borders on self-congratulatory and is only thinly veiled as academic prose. There is no engagement with potential limitations, no reference to complication management, and no reflection on how the team iterates on surgical failures or inconclusive SEEG results. The lack of cited literature (beyond their own history) reflects a siloed view.

Verdict:

This is a historically interesting but scientifically hollow institutional showcase. It lacks rigor, data, and transferable value.

Takeaway for Neurosurgeons:

Unless you're cataloging SEEG history, skip this piece. No actionable insights are offered for the modern epilepsy surgeon.

Bottom Line:

Poorly structured, data-void institutional overview that offers little to no practical value to neurosurgeons. A wasted opportunity from a legacy center.

Rating: 2.5 / 10

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2)
Bank AM, Billakota S, Bateman LM, Hamberger MJ, Cole J, McKhann GM, Feldstein N, Schevon CA. Electrically stimulated auras as a potential biomarker of the epileptogenic zone. Epilepsy Behav. 2021 Jun 14;122:108116. doi: 10.1016/j.yebeh.2021.108116. Epub ahead of print. PMID: 34139619.
3)
Filipescu C, Landré E, Zanello M, Moiraghi A, Mellerio C, Boutin M, Crépon B, Pruvost-Robieux E, Llorens A, Pallud J, Gavaret M. Stereoelectroencephalography at Sainte-Anne Hospital, Paris, France. Neurophysiol Clin. 2025 Jun;55(3):103057. doi: 10.1016/j.neucli.2025.103057. Epub 2025 Feb 5. PMID: 39914004.