

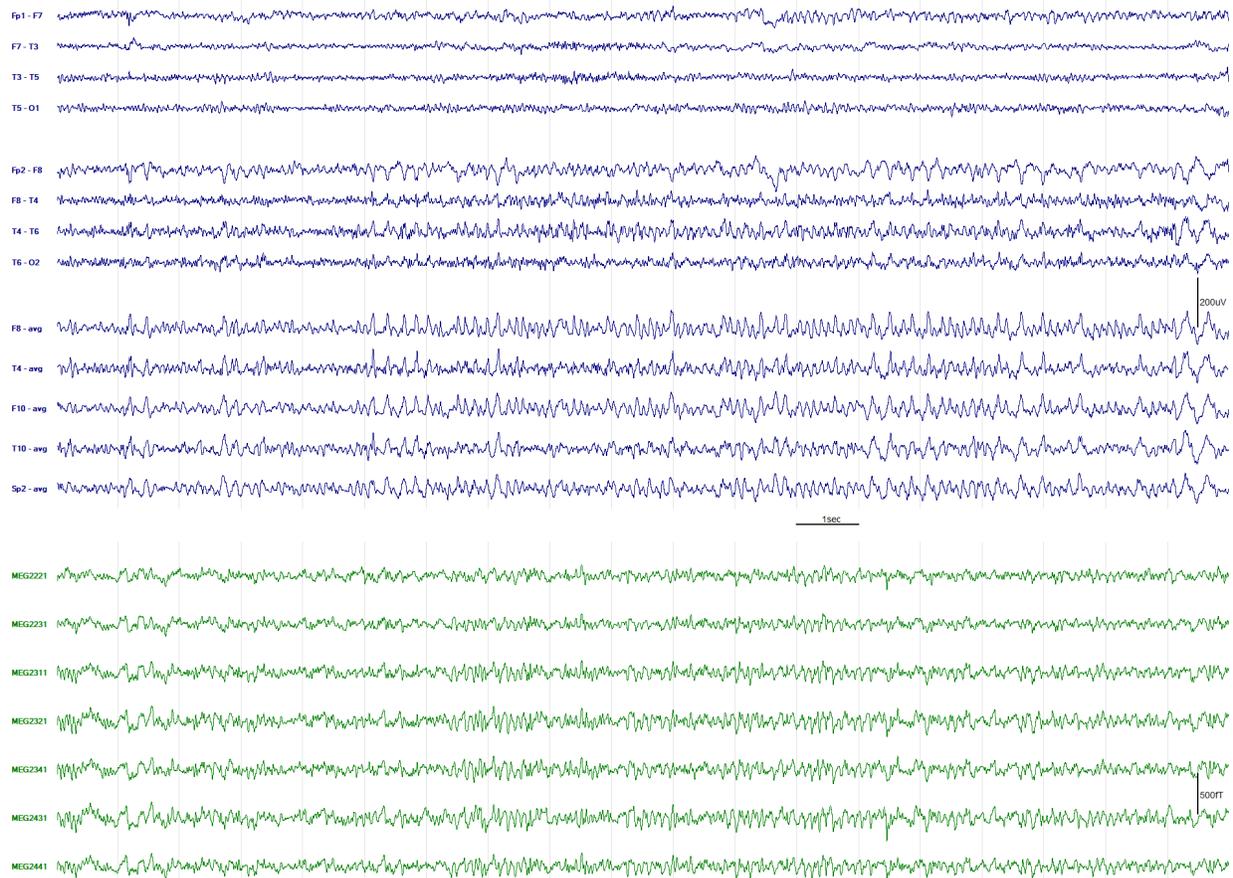
Supplementary material

Luis Garcia Dominguez, Apameh Tarazi, Taufik Valiante, Richard Wennberg.

Beamforming seizures from the temporal lobe using magnetoencephalography.

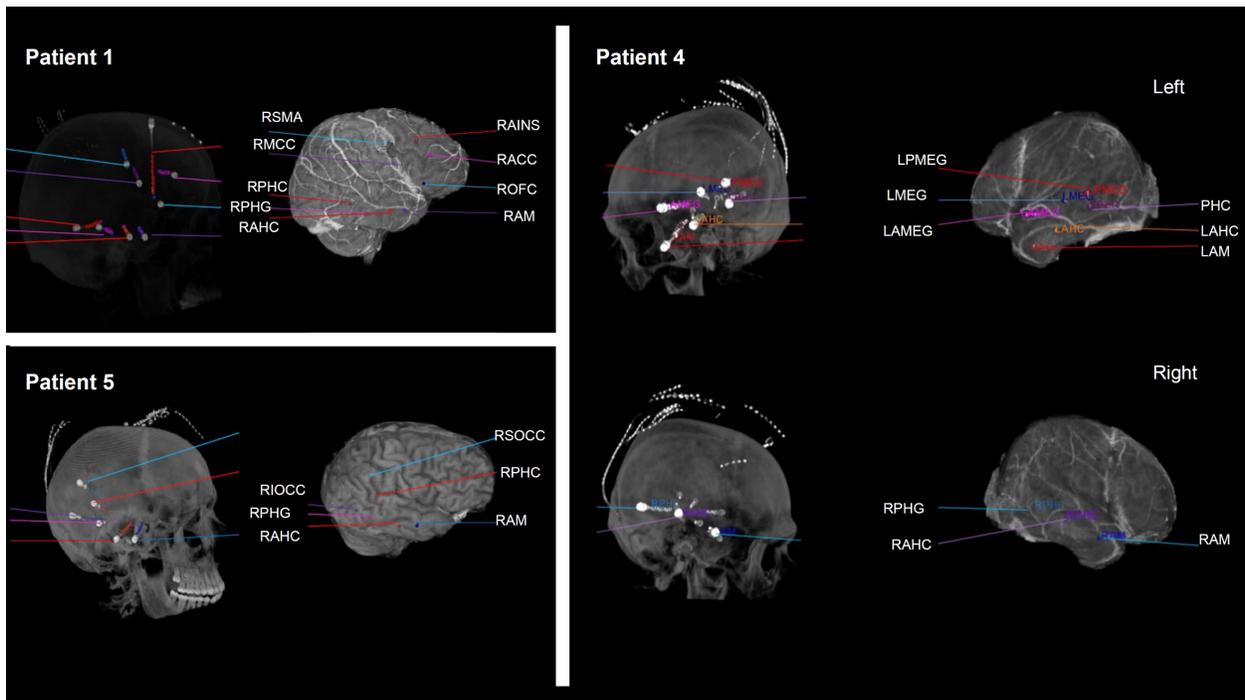
Supplementary Figures 1-5.

Supplementary Figure 1.



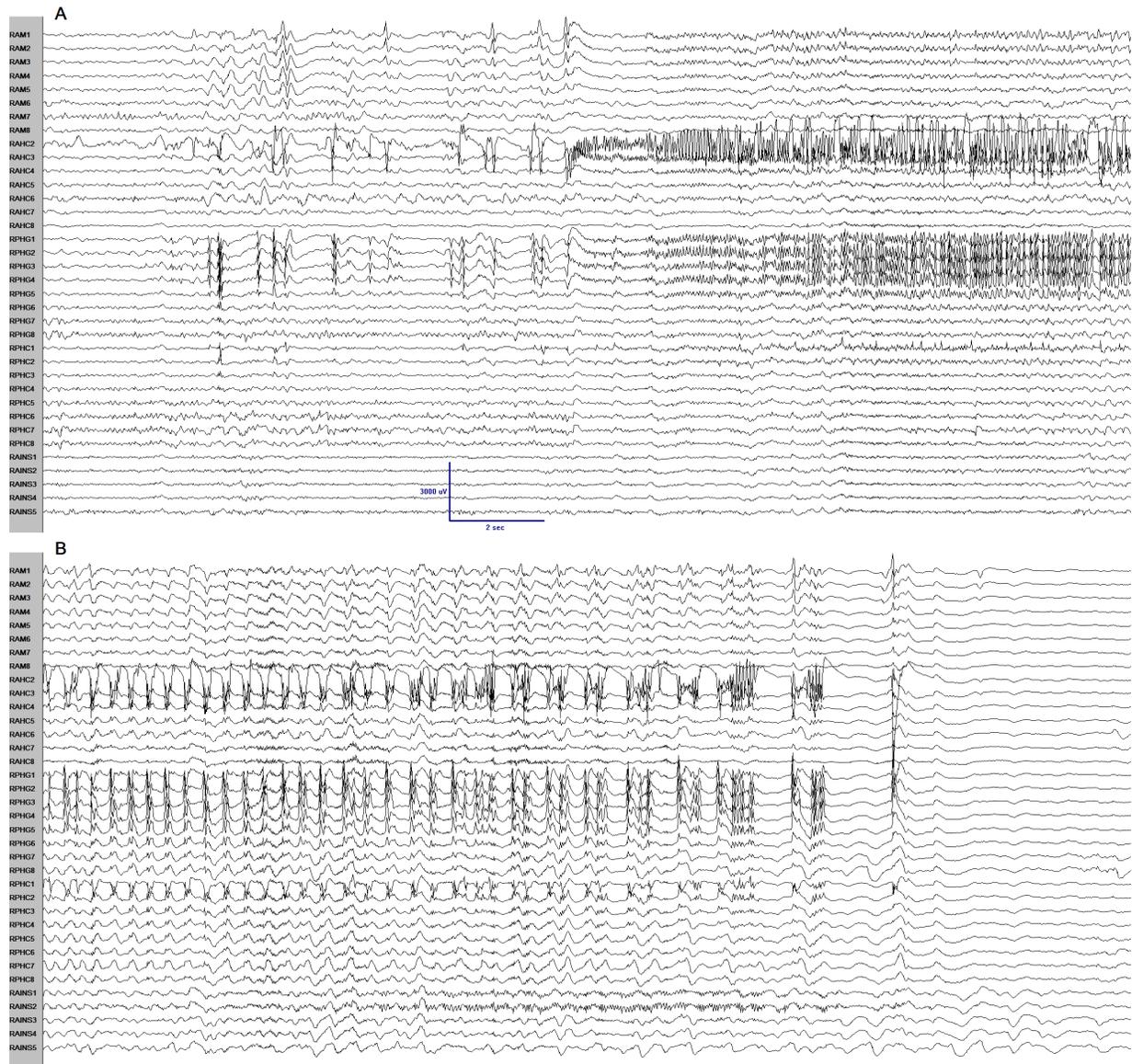
EEG-MEG recording of seizure onset in patient 1, the rhythmic ictal activity appearing maximal in EEG at F8, F10, Sp2 > T4, T10. The ictal discharge was not easily identifiable in MEG: seven magnetometer channels that appeared to show an ictal correlate to the seizure evident in EEG are shown. Filter bandpass for figure = 1-30 Hz; avg = common average reference.

Supplementary Figure 2.



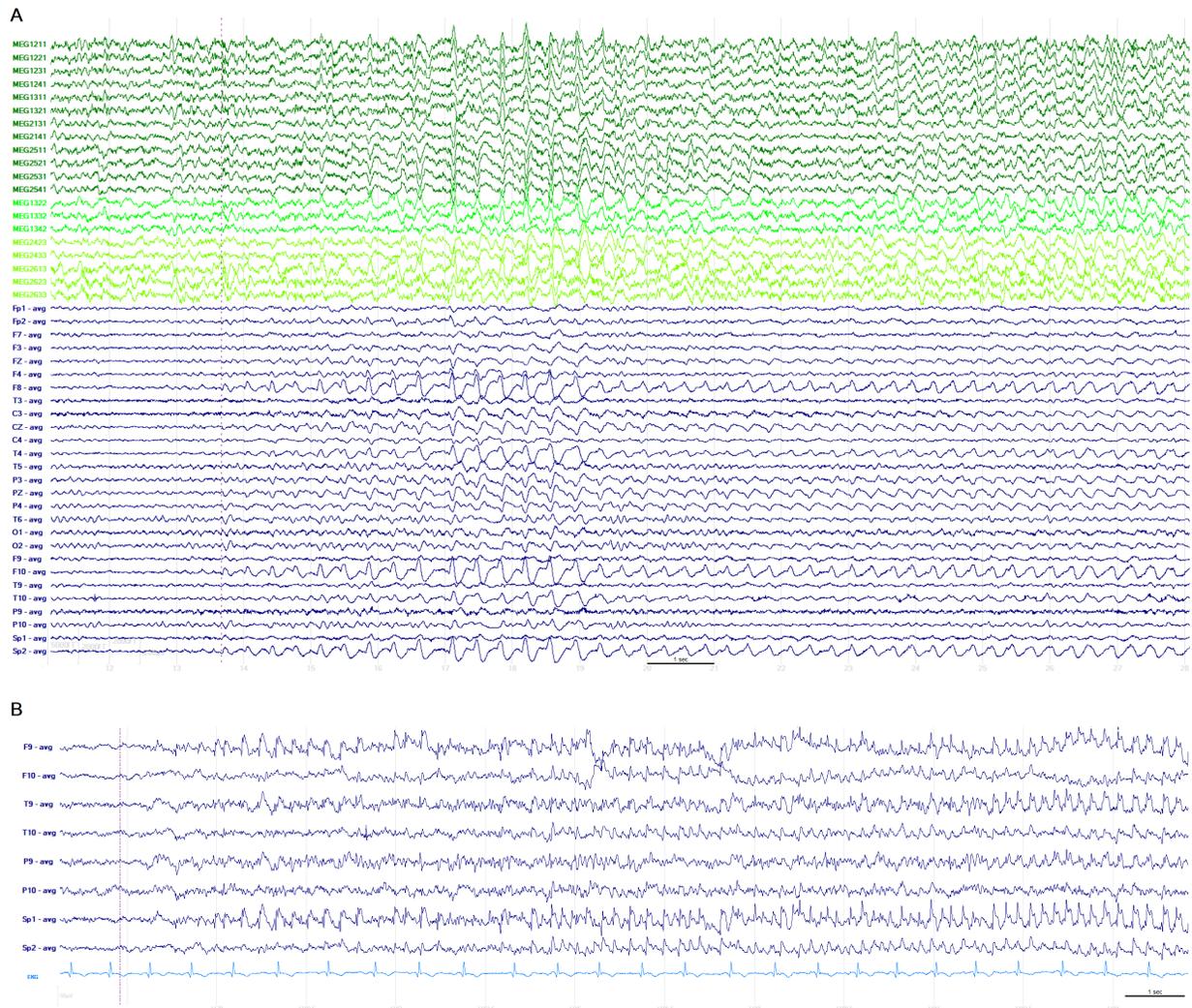
Intracranial sEEG depth electrode implantations; patients 1, 4 and 5. Electrode labels described in figure legends of main text.

Supplementary Figure 3.



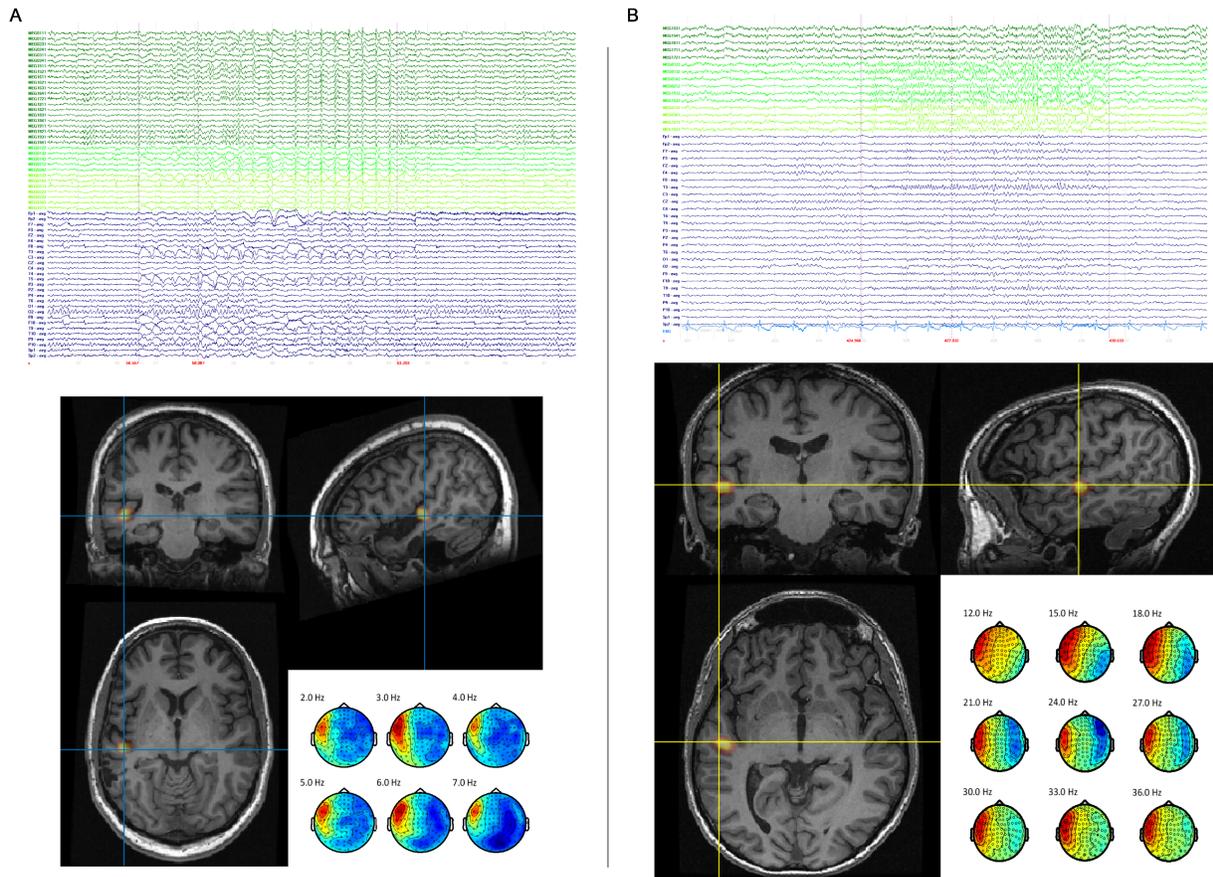
Ictal event recorded with sEEG in patient 1. (A) Seizure onset in anterior hippocampus (RAHC2) and parahippocampal gyrus (RPHG1-4). (B) Ictal propagation to posterior hippocampus (RPHC1) and, independently, anterior insula (RAINS1-2). Filter bandpass for figure = 1-50 Hz; subgaleal reference.

Supplementary Figure 4.



(A) EEG-MEG recording of seizure onset in patient 2, the rhythmic ictal activity appearing maximal in EEG at F8, F10, Sp2, simultaneously apparent in a selection of magnetometer (dark green) and orthogonal planar gradiometer (green and light green) MEG channels. (B) EEG ictal onset of seizure during EEG-MEG recording in patient 3, appearing maximal at F9, Sp1 > T9. The ictal discharge was not visually identifiable in MEG. Filter bandpass for figures = 1-70 Hz; avg = common average reference.

Supplementary Figure 5.



Examples of plausible ictal beamforming solutions in two patients without ground truth evidence of SOZ localization. (A) EEG-MEG recording of ictal event (top) in a 30-year-old patient with persistent seizures after previous left temporal neocortical resection. Initial resection guided by sEEG and MRI evidence of focal gliosis in left inferior temporal gyrus. No MEG recording prior to surgery. Current seizures associated with auditory (ringing) aura and ictal aphasia. Ictal beamformer source reconstruction and topoplots (bottom); source maximum in left superior temporal gyrus, above site of previous resection, near auditory cortex and Wernicke's area. (B) EEG-MEG recording of ictal event (top) in a 29-year-old patient with episodes of ictal aphasia. Normal brain MRI, awaiting sEEG investigation. Ictal beamformer source reconstruction and topoplots (bottom); source maximum at base of vertical sulcus in left superior temporal gyrus. Filter bandpass for EEG-MEG figures = 1-70 Hz; avg = common average reference.