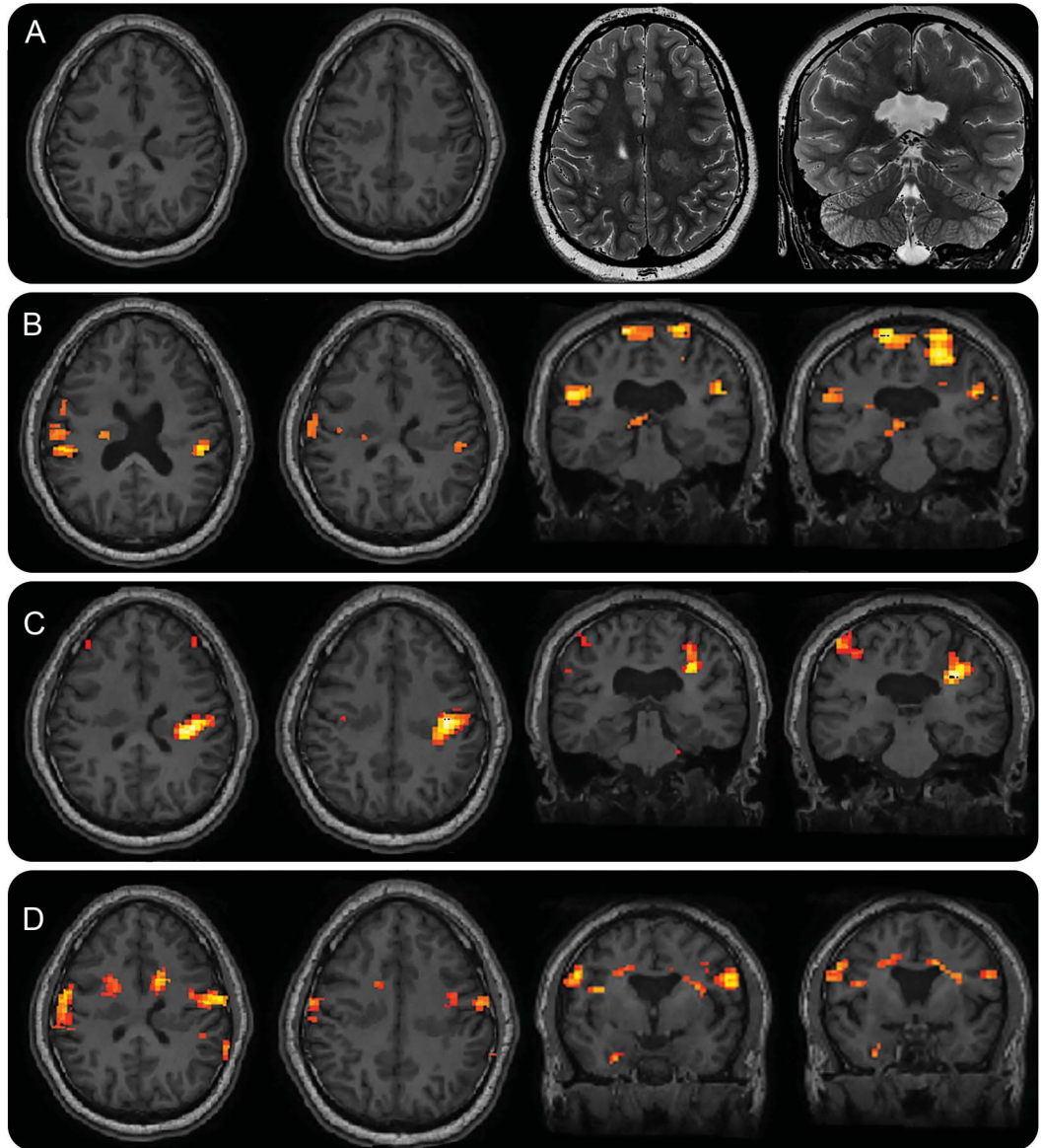


Teaching NeuroImages: Homotopic motor distribution on fMRI in closed-lip schizencephaly

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Figure 1 3T brain MRI and functional MRI of a 16-year-old boy with intractable focal epilepsy due to schizencephaly and polymicrogyria



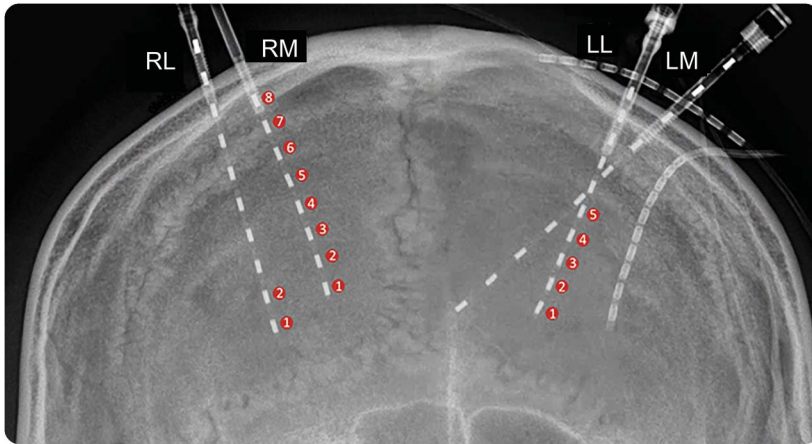
Axial T1-weighted (left) and axial and coronal T2-weighted (right) images demonstrate polymicrogyria extending from the cerebral convexity to the ventricular margin. Focal cleft where abnormal gray matter meets the ependymal surface is consistent with closed-lip schizencephaly (A). Activation with repetitive bilateral foot (B), bilateral finger (C), and tongue tapping (D) reveals homotopic distribution of motor cortex with hand deep into the cleft centrally, foot mesially, and mouth laterally at the edge of the area of schizencephaly. The threshold for the study was set at top 5% of voxels.

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Figure 2 Skull radiograph shows depth electrode placement



Motor mapping is shown as red dots next to the electrodes. Right lateral (RL): stimulation of electrodes 1-2 resulted in motion of the left hand; right medial (RM): stimulation of electrodes 1-2 resulted in left arm and face motion; 3-4, jaw motion; 5-6, left side of mouth motion; 7-8, left knee twitch; left lateral (LL): stimulation of electrodes 1-2 resulted in right hand then right arm then right leg twitch; 3-4, right leg extension; 5, right foot twitch.

A 16-year-old boy with intractable focal epilepsy with preserved awareness and attention-deficit/hyperactivity disorder underwent evaluation for epilepsy surgery. Epilepsy onset occurred at age 5 years; seizures arise from sleep and are characterized by right arm extension with preserved consciousness. Ictal EEG has no clear localization or lateralization. MRI brain demonstrates

bifrontal closed-lip schizencephaly. Functional MRI (fMRI) shows homotopic distribution of tongue/finger/foot motor function at the edge of and along the depth of the schizencephalic cleft, supported by intracranial mapping (figures 1 and 2). fMRI is a reliable tool to identify the eloquent cortex in the planning for epilepsy surgery.^{1,2}

AUTHOR CONTRIBUTIONS

Dr. Bartolini designed and drafted the article. Dr. Kao contributed to the design and draft of the article. A. Zachery processed the fMRI and contributed to the article draft. Dr. Murnick reviewed the manuscript and contributed to the interpretation of the structural MRI. Dr. Gaillard reviewed the manuscript and contributed to the interpretation of the fMRI.

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DISCLOSURE

L. Bartolini serves as the Practice Current Section Editor of *Neurology*[®] *Clinical Practice* and is a member of the editorial team of the *Neurology Resident & Fellow* section. A. Kao, A. Zachery, and J. Murnick report no disclosures relevant to the manuscript. W. Gaillard is Associate Editor of *Epilepsia* and *Epilepsy Research*. Go to Neurology.org for full disclosures.

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