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The Role of MEG in Epilepsy Surgery: A Pediatric Cohort from a Tertiary Care Epilepsy Center

OBJECTIVES: To describe MEG experience and its unique contribution to the epilepsy surgery plan in a large pediatric cohort. METHODS: 120 children (<18-year-old) who had presurgical MEG and subsequent epilepsy surgery were studied retrospectively. The concordance between MEG dipole localization and resected regions was categorized as concordant (MEG dipoles occupied the same region as the surgery over no more than two lobes), concordant+ (MEG dipoles in the same region but MEG occupied a larger area than the surgery), concordant- (MEG dipoles in the same area but MEG occupied a smaller area than the surgery), partially concordant (partial overlap between MEG and the surgery), and discordant (no overlap between MEG and the surgery). RESULTS: MEG locations and surgery were concordant in 27%, concordant plus in 27%, concordant minus in 15%, partially concordant in 11%, and discordant in 20% patients. Epileptic dipoles was totally removed (54%), or resection of dominant (50% of all dipoles) and tightly clustered (40%) dipoles among multiregional MEG dipoles (49/120) were associated with greater seizure freedom (P<0.05) MEG unique dipoles in non-lesional cases (11%) were concordant with those areas identified by subsequent invasive recording. 18 % of the patients had previous surgery and still remnant dipoles along the resection border, providing

valuable information for planning extension of the resection. CONCLUSION: MEG was a useful tool in determining dominant or solitary focal sources in children before epilepsy surgery. Even the cases whose presurgical workup showed multiregional and generalized epileptiform abnormalities, MEG can identify, separate, and refine the epileptic zones.
Keywords: Epilepsy Surgery, Pediatric, Magnetoencephalography

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