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Electrocorticography and intraoperative neurophysiology monitoring of epilepsy surgery

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Electrocorticography (ECoG) is the direct recording of electrical potentials associated with brain activity from the cerebral cortex. ECoG is comprehensive to reading electrical activity whether its spontaneous similar to Electroencephalogram (EEG) or evoked as in case of central sulcus mapping technique. The grid electrodes used for recording can be used as stimulators as well; this invasive stimulation and recording from the human brain can provide unique opportunities to study fundamental processes at fine temporal and spatial resolution. ECoG vs. EEG; while ECoG is useful in temporal and spatial localization, EEG is useful to look for diffusion of the seizure, either in the same or the contralateral hemisphere. The circumstances during which ECoG is employed vary among hospitals, at some institutions, recordings are made during all epilepsy surgeries, and the intraoperative findings are used to tailor the surgical resection to each patient. At other centers, ECoG is used selectively (e.g. only in extratemporal procedures). On the other hand, it may be performed universally for research purposes but the findings then are not used in determining the volume of brain tissue to be resected. EEG and ECoG recordings are important during the entire duration of the procedure because they allow monitoring for the occurrence of after-discharges, electrical seizures, and even clinical seizures. The occurrence of after-discharges is quite common during these procedures, and the main objective of monitoring is to recognize those that occur in response to stimulation. Technical limitations of recording and keeping the electrode in place during the surgery should be considered. Controversy also exists concerning the use of ECoG to guide the extent of resection of adjacent or distant seizure foci associated with brain tumors.

Biography

Elamir H Elsherif is a Neurophysiologist Physician. He has completed his Medical degree in 2002 at Ain Shams University in Cairo. He had his training in Neurophysiology in Kings County and Downstate Hospitals in Brooklyn New York. In 2008, he completed the American Board of Neurophysiologic Monitoring in Chicago. Currently, he is working as a Consultant of Intra-operative Neuromonitoring and the Director of Neurosonology Lab at King Fahd Medical City. He is interested in Cortical Mapping, Neuromodulation and Brain Computer Interfaces.

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