Traumatic Brain Injury Examinations Using Advanced Digital EEG & Spectral Analysis

Frank H Duffy MD

Associate Professor of Neurology,
Harvard Medical School, Boston

Director of Developmental Neurophysiology,
The Children's Hospital, Boston

Licensure and Certification:
Electroencephalography

Department/Division
Neurology

Specialties
Epilepsy/Seizures, Neurology

Case Study:

A 21-year-old white man was employed and functioning normally until four years prior to study, when he was involved in a minor **automobile accident** where he struck his forehead on the vehicle's windshield as it abruptly halted. There was no loss of consciousness, and he was dismissed from the emergency room with a normal examination and skull x-ray.

His subsequent work performance was inadequate; he became clinically depressed and began to hear voices. He was hospitalized in several major mental institutions where he was given a total of three CT scans, all normal, and two EEGs, which showed non-diagnostic minor abnormalties (Slight Theta slowing). He was originally diagnosed as a paranoid schizophrenic. Because he failed to respond to typical pharmacological therapy, he was eventually transferred to a Harvard psychiatric teaching hospital and additional tests were ordered.

A CT scan and standard EEG were again normal. BEAM* results, illustrated in plate 27 and described in the accompanying legend, suggested bihemispheric abnormality of a type associated with irritable cortex. The left frontal/right posterior abnormalities were taken as possible evidence of a coup/contracoup head injury. Because of the irritable nature of the electrophysiological abnormality, carbamazepine was started. The patient's response was rapid, with cessation of hallucinations within three days. Ten days later he was discharged from a mental institution for the first time in four years.

References:

Duffy, Frank H., Topographic Mapping of Brain Electrical Activity. Butterworths, 1986; 25:409

* BEAM - The acronym for Brain Electrical Activity Mapping.

"Spurred on by advances in computer electronics, topographic mapping of cerebral electrical activity is showing initial promise for distilling and displaying electrophysiological data from the brain in ways simultaneously more sophisticated and more accessible than standard EEG recordings." - Dr. Frank H Duffy