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Foot Tapping Artifact during Stereoelectroencephalography

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Abstract

Artifacts are signals recorded on the electroencephalogram that are not cerebral in origin and can be divided into physiological and non-physiological artifacts. While physiological artifacts are generated from the patient itself both scalp and stereotactic EEG (SEEG) recordings are more commonly contaminated by numerous non-physiological artifacts generated from the immediate patient surroundings. We report a physiological artifact generated by rhythmic foot tapping during SEEG recording.

Case Report

A 33-year-old male with medically refractory epilepsy post motor vehicle accident with bifrontal and right temporal encephalomalacia on MRI underwent stereoelectroencephalography with insertion of 8 depth electrodes. There was sudden appearance of rhythmic sharply contoured waveforms in multiple adjacent electrodes concerning for an ictal event (Figure 1). Video correlate revealed the patient tapping his foot rhythmically. The artifact was reproducible every time the patient tapped his foot.

Discussion

Artifacts are signals recorded on the electroencephalogram that are non-cerebral in origin and can be divided into physiological and non-physiological artifacts [1]. Non-physiological artifacts are generated from the immediate patient surrounding and commonly contaminate both scalp and stereo EEG recordings. In the intensive care unit setting common non-physiological artifacts include those generated by monitoring devices, infusion pumps and suctioning devices. Electrical devices like mobile phones and laptops may also contaminate the EEG record [2]. Physiological artifacts are generated from the patient itself and include cardiac, gloss kinetic, muscle also referred to myogenic, eye movement (eye flutter artifact, lateral rectus spikes), respiratory and pulse artifact among many others. In our patient a rhythmic sharply contoured artifact involving multiple adjacent SEEG electrodes was generated by the patient rhythmically tapping his foot. This artifact has the potential to cause misinterpretation of the EEG as an ictal event at the hands of a causal reader or if video correlation is unavailable for some reason. Physiological and non-physiological artifact recognition is important to avoid misinterpretation of the EEG and erroneous treatment decisions [3,4].

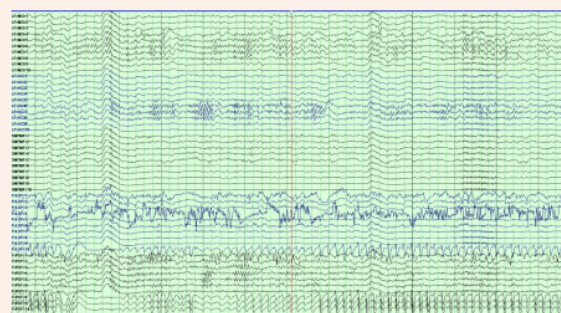


Figure 1(a)

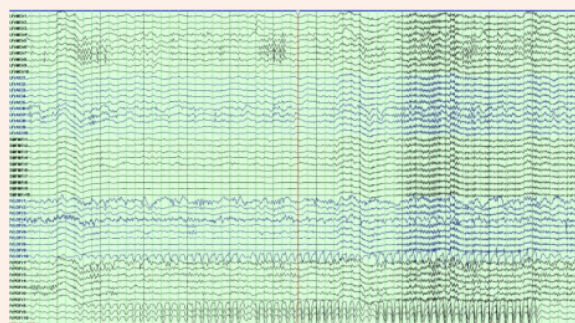


Figure 1(b)

Figure 1: Stereo EEG showing abrupt onset of rhythmic sharply contoured waveforms in multiple adjacent electrodes concerning for an ictal event.



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