

Video game-induced reflex seizures via a smartphone

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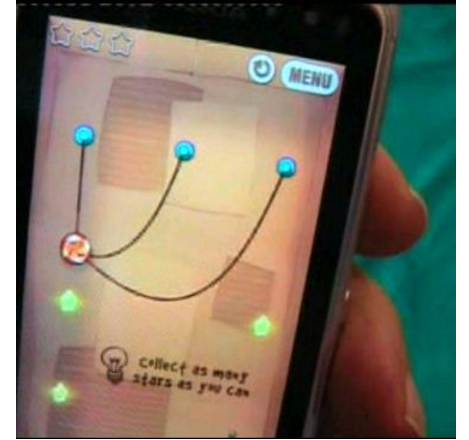
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Video game-induced reflex seizures via a smartphone

Background

- *Cut the Rope* is a touch-screen video game in which the player has to pick up candy “with his fingers” to feed a monster and collect three scattered stars. If the candy falls without going into the monster’s mouth, the game is over.

This game requires a combination of cognitive tasks, including manual skill and speed and good visual-motor function.



We describe a boy experiencing reflex seizures (RS) induced by prolonged exposure to this video game

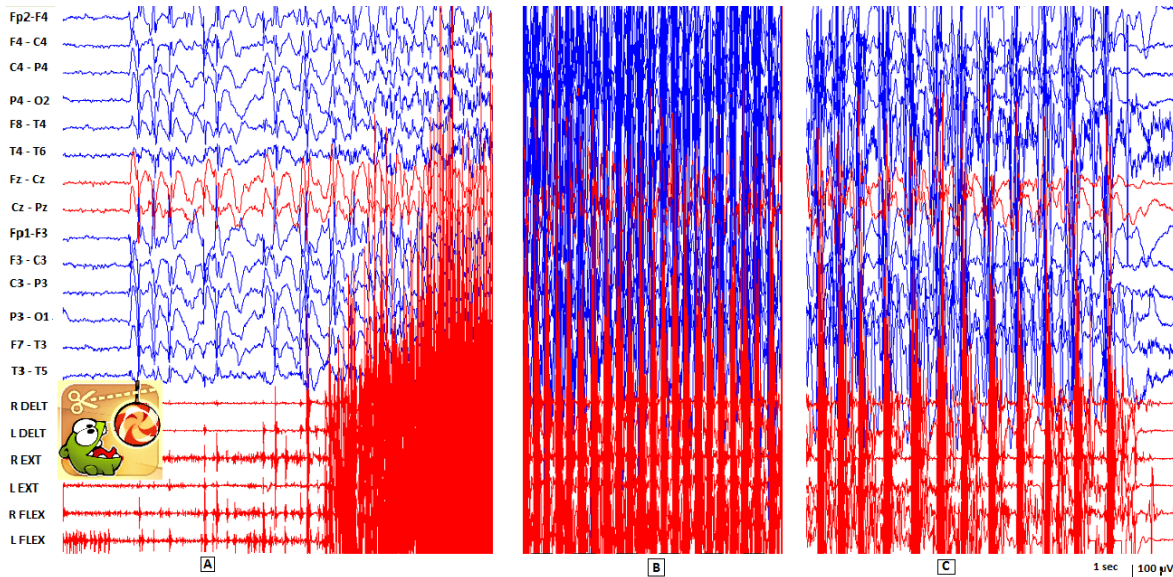
Case study

A 17-year-old boy was referred to the epilepsy clinic due to a tonic-clonic seizure upon awakening, after prolonged sleep deprivation while playing the video game *Cut the rope* on his mobile phone. The seizure lasted approximately five minutes and spontaneously resolved.

Medical history. Family history was unremarkable for seizures, epilepsy, and neurological disorders. The patient's delivery was uncomplicated, with spontaneous birth and a normal neonatal period. Cognitive, fine, and gross motor development were unremarkable.

Video-EEG. Prolonged (14 EEG and 6 EMG channels) polygraphic recording with simultaneous video was performed. Both resting and sleep EEG were unremarkable. Intermittent photic stimulation and visual patterns during cognitive tasks (calculation, reading) were performed without effect. The boy was invited to play several different video games, previously installed on his mobile phone, for 30 minutes with no effect. Finally, the game *Cut the rope* was tested and after 10 minutes, an abrupt electroclinical event occurred consisting of irregular diffuse spike-and-wave and polyspike-and-wave discharges, clinically related to the myoclonic jerks of the upper limbs (*figure 1; video-sequence 1*), followed by a convulsive seizure.

Case study



Ictal EEG recording showing diffuse spike-and-wave and polyspike-and-wave discharges correlating with myoclonic jerks involving the upper limbs, and eventually resulting in a tonic-clonic seizure.

Treatment and outcome. Valproate (500 mg/day) was prescribed, and the patient accepted to avoid playing *Cut the rope* if he could still regularly use his smartphone for other activities, including other video games. At the 52-month follow-up visit, he was seizure-free, and his last EEG was unremarkable.

Discussion

- *Cut the rope* was the only provocative factor reported by the patient.
- The simultaneous involvement of different mechanisms, linked to pattern stimulation, emotional or cognitive excitement/tension, proprioceptive stimuli (movement/praxis) associated with fatigue, insomnia, and playing games for a long time, may lead to large-scale neuronal activation.
- We are not aware of any other patient reporting this specific video game as a trigger for seizures, either from our cohort or from the literature .
- Our case highlights that playing video games on mobile phones may potentially induce reflex seizures, similar to other commonly used platforms such as docking stations connected to video screens.