Status Epilepticus Convulsive

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Case Presentation

A 23-year-old male with a history of focal epilepsy manifest as recurrent focal impaired awareness seizures and intermittent focal to bilateral tonic-clonic seizures was taking levetiracetam 500 mg twice a day. He was seizure-free as long as he remained compliant with his antiseizure medication (ASM). He was reported to have recently been away on a camping trip with several of his friends. While he was away, he was sleep deprived due to the long period of time he remained awake often staying up until late hours of the early morning. Shortly after midnight he developed a generalized tonic-clonic seizure. This was repeated two more times, and his friends called 911 for help. He was transported to the nearest hospital and had persistent impairment of his consciousness. In the emergency department (ED), he did not answer questions and was "just staring at the nurses." A CT of the brain was unrevealing. Laboratory evaluation did not demonstrate any abnormalities in his electrolytes or complete blood count with differential. A toxicology screen was negative for illicit substances as well as for alcohol. A carbamazepine level was undetectable.

An EEG was obtained in the ED (Fig. 36.1) due to persistent alteration of consciousness.

Clinical Questions

1. What is the definition of status epilepticus?
2. How does the EEG help in making the diagnosis?
3. What should comprise the initial evaluation of status?

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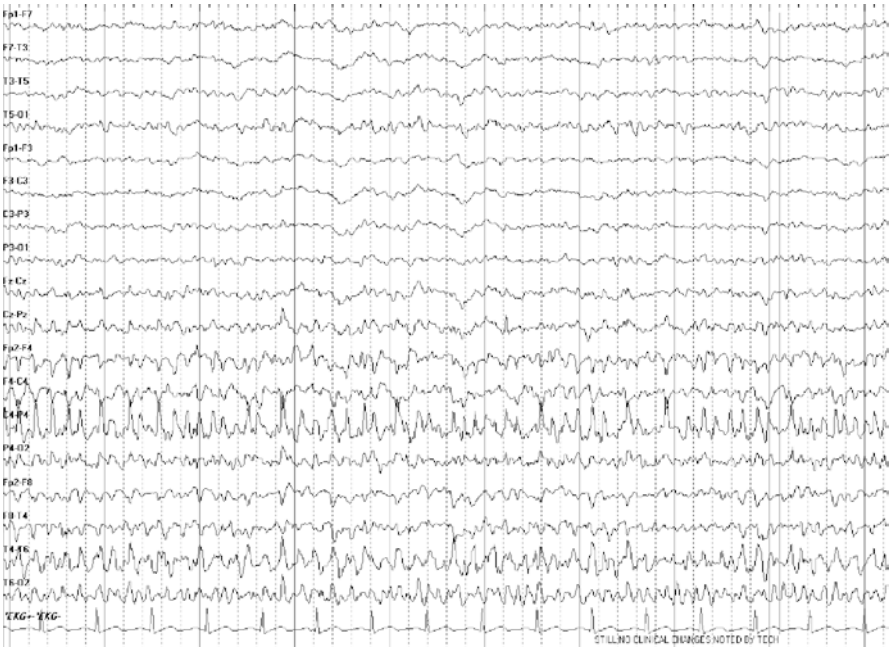

Fig. 36.1 Focal electrographic status epilepticus confined to the right hemisphere

4. What is the initial approach to treatment?
5. What role does the EEG have in the management of this condition?

Diagnostic Discussion

1. Status epilepticus has been defined as 30 min or more of a prolonged seizure or the patient does not return to their baseline state between recurrent seizures. Operational definitions now include any seizure that is greater than 5 min. Status epilepticus is a medical emergency, and newer definitions reflect the move toward earlier treatment [1–6].
2. This EEG shows ongoing status epilepticus with ongoing seizure activity emanating from the right hemisphere (see arrow on Fig. 36.1). This patient initially had convulsive status epilepticus that evolved to nonconvulsive seizures to explain the impaired consciousness in the emergency department (ED).
3. Status epilepticus is a serious life-threatening condition with a risk of significant morbidity and mortality. The initial evaluation includes neuroimaging studies of the brain to identify a potential structural basis of status and the need for treatment of the cause. Laboratory evaluation should include a complete metabolic profile and blood count. Addressing electrolyte imbalance and evidence of infection are especially important. Toxicology for therapeutic and illicit substance use and abuse is essential in the primary search for the etiology of status.

4. Figure 36.2 [6] demonstrates the protocol for status epilepticus management. It is essential that first responders ensure a patent airway and adequate respiration. Circulation also is addressed and maintained for primary life support. The initial approach to treatment should include administration of 1 ampule of D50W (glucose) to limit potential consequences from hypoglycemia. Especially in diabetics, this common cause of status epilepticus can lead to permanent damage if not

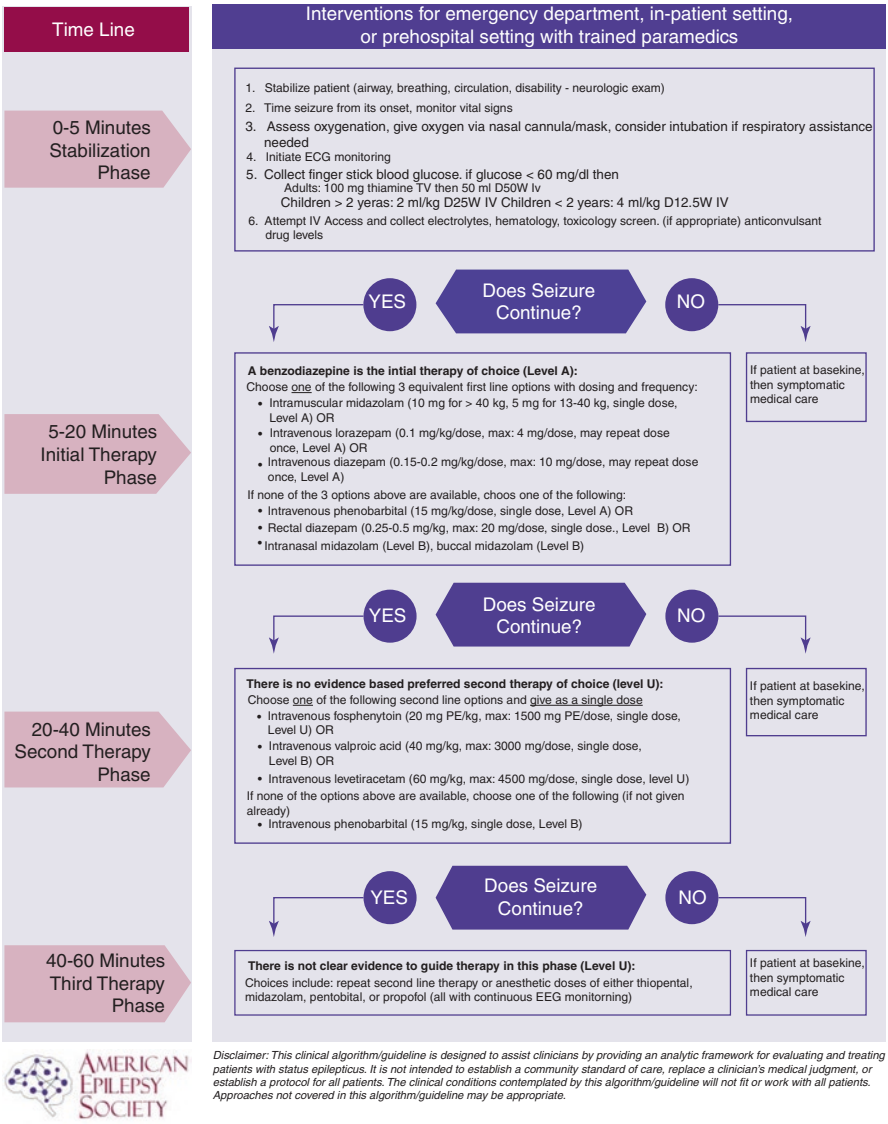

Fig. 36.2 American Epilepsy Society Protocol for Status Epilepticus, fig taken from ref. [6])

treated aggressively. Similarly, folic acid and thiamine are administered (especially in chronic alcohol abusers) to off-set nutritional deficits. The initial drug treatment should include a benzodiazepine. 2–4 mg of IM midazolam, 2–4 mg of IV lorazepam, or 5–10 mg of IV diazepam should be given. This should then immediately be followed by maintenance ASM. Twenty mg/kg of IV fosphenytoin or 40 mg/kg of valproic acid or 60 mg/kg of levetiracetam are all acceptable choices and has been the usual approach in adults with focal seizures unless there are extenuating circumstances that mitigate against its use.

5. The EEG has one of the most important roles in the management of convulsive status epilepticus. Once generalized convulsive status epilepticus has been recognized, an EEG is needed in order to exclude ongoing nonconvulsive status epilepticus and assess the response to therapy. Continuous EEG or quantitative EEG is a valuable tool that is essential in detecting ongoing electrographic seizures and status epilepticus that may often occur after the motor manifestations of convulsions have ceased as noted in our patient.

Clinical Pearls

1. Convulsive status epilepticus is serious and a potentially life-threatening neurological emergency.
2. The operational definition of status epilepticus applies to seizures that are greater than 5 min in duration reflecting the emergent need for treatment due to the likelihood of continued seizure.
3. The evaluation of patients presenting with convulsive status epilepticus should include assessments for illicit substance, complete blood count and metabolic profile, urinalysis, chest X-ray, EKG, brain imaging, and antiepileptic drug levels if the patient has a history of epilepsy.
4. All clinicians who manage people with status epilepticus should have a clear well-delineated protocol. This is essential so that an established course of action exists for patients who present with status to ensure that no time is lost.
5. The three most crucial prognostic factors determining the outcome from status epilepticus reflects the underlying etiology, the speed of anti-seizure treatment, and the age of the individual. Older-aged individuals frequently have a symptomatic cause as well as possessing a more limited reserve to recover due to comorbidities and have a higher mortality rate with status epilepticus.

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