

Paradoxical Lateralization of Convulsive Movements in a Subtle Status Epilepticus

Eun-Hee Sohn, M.D., Ki-Young Jung, M.D., Jae-Moon Kim, M.D.

Department of Neurology, Chungnam National University Hospital

Background : Subtle status epilepticus (SE) is an end-stage of convulsive SE. This phenomenon might be a clinical expression of neuronal exhaustion caused by sustained electrical discharges. As subtle SE may show diverse clinical features, early detection depends on clinical suspicion.

Case : A 68-year-old woman was presented with repetitive involuntary movement of right limbs after two generalized tonic-clonic seizures. She experienced right middle cerebral artery infarction 4 months ago, and after the event, left side hemiplegia sustained. These seizures were first-ever after the cerebral infarction. Orientation and verbal responses were fairly preserved but general cognitive function was minimally slowed. During the video-EEG monitoring, repetitive sharp waves were noted in the right hemisphere and these sharp waves occasionally spread to the contralateral side. Her right side involuntary movement was identifiable when the epileptic discharges were found on her right hemisphere.

Conclusion : We suggested that this unexpected convulsive movement is a reflection of earlier exhaustion in the right hemisphere or deafferentation of right hemisphere because of preexisting neuronal damage.

Case

A 68-year-old woman visited emergency room due to repetitive involuntary movement of right limbs. Thirty minutes prior to the involuntary movement, she experienced two episodes of generalized tonic-clonic seizures. At emergency room, orientation and verbal responses were fairly preserved but general cognitive function was minimally slowed. Four month ago, she was admitted our neurologic department with left side hemiplegia due to right middle cerebral artery infarction(Fig. 1). Left side motor weakness was sustained. About 20 years ago, she medicated antiepileptic drugs due to generalized tonic-clonic seizure. Since 1993, there was no fit so she

stopped medication several years ago. These seizures were first event after the cerebral infarction. During the video-EEG monitoring, continuous ictal discharges with intervening flat periods were noted in the right hemisphere and these ictal discharges occasionally spread to the left hemisphere. Her right side involuntary movement was identifiable when the ictal discharges were found only in the right hemisphere (Fig. 2).

Hospital Course: Initially 900 mg of phenytoin was injected without response. Involuntary movements and electrical abnormalities were continued.

In the next step, midazolam 5 mg was infused as a loading dose and was followed by maintaining dose of 0.75 mg/kg/hr. Involuntary movement was stopped and electrical activity was normalized as well.

Discussion

Current definition of status epilepticus is recurrent epileptic seizures without full recovery

Address for correspondence

Jae-Moon Kim, M.D.

Department of Neurology,

Tel : +82-42-220-7806, Fax : +82-42-252-8654

E-mail : jmoonkim@cnu.ac.kr

of consciousness before the next seizure begins or more-or-less continuous clinical and/or electrical seizure activity lasting for more than 10 min whether or not consciousness is impaired.

Although the classification of SE is still controversial, three subtypes of generalized convulsive SE (includes both primary and secondary generalized seizure), nonconvulsive SE (epileptic twilight state), and simple partial SE (no impairment of consciousness) are frequently used in the clinical practice. Generalized convulsive SE includes overt (GTC or major motor status epilepticus) and subtle (most cases of "myoclonic" status epilepticus and "electrical" status epilepticus) SE. Similarly, nonconvulsive SE has two subtypes of complete partial SE and absence SE. These uncertainty of classification made a lot of confusion in the diagnosis of SE.

Especially in the case of trace convulsive movements or no visible movements, Treiman et al. (1984) suggested subtle SE.¹ Usually, subtle SE is suspected in the considerable confusion with subtle signs of convulsive activity in patients with severe encephalopathies caused by underlying systemic illness, primary brain lesions such as massive cerebral infarctions or infections, or prolonged uncontrolled overt generalized convulsive

SE. Similar SE was differently named according to the authors as somatomotor status epilepticus³ or generalized status myoclonus.⁴

Most significant clinical features of subtle SE is subtle convulsive motor activity. Usually these motor activities are continuous and rhythmic and frequently found in the small area in the body such as eyelid, facial, or jaw. Sometimes, only minor twitching or rhythmic nystagmoid eye jerks, or rhythmic subtle focal twitches of the trunk or extremities can be a clue of clinical suspicion. Profound impairment of consciousness and usually small amplitude, bilateral EEG ictal discharges are key factors to the precise diagnosis.

Suggested mechanism of subtle SE is "electromechanical dissociation".

As SE progresses, pathophysiological changes begin to occur that appear impair rostral-caudal transmission. These dissociation result in increasingly subtle clinical manifestations of the seizure activity.² When SE occurs in the presence of a severe underlying encephalopathy, an "electromechanical dissociation" occurs such that, in spite of the presence of bilateral ictal discharges on the EEG, the encephalopathic brain is unable to transmit message from the cortex with seizures to muscles in the trunk and extremities to cause

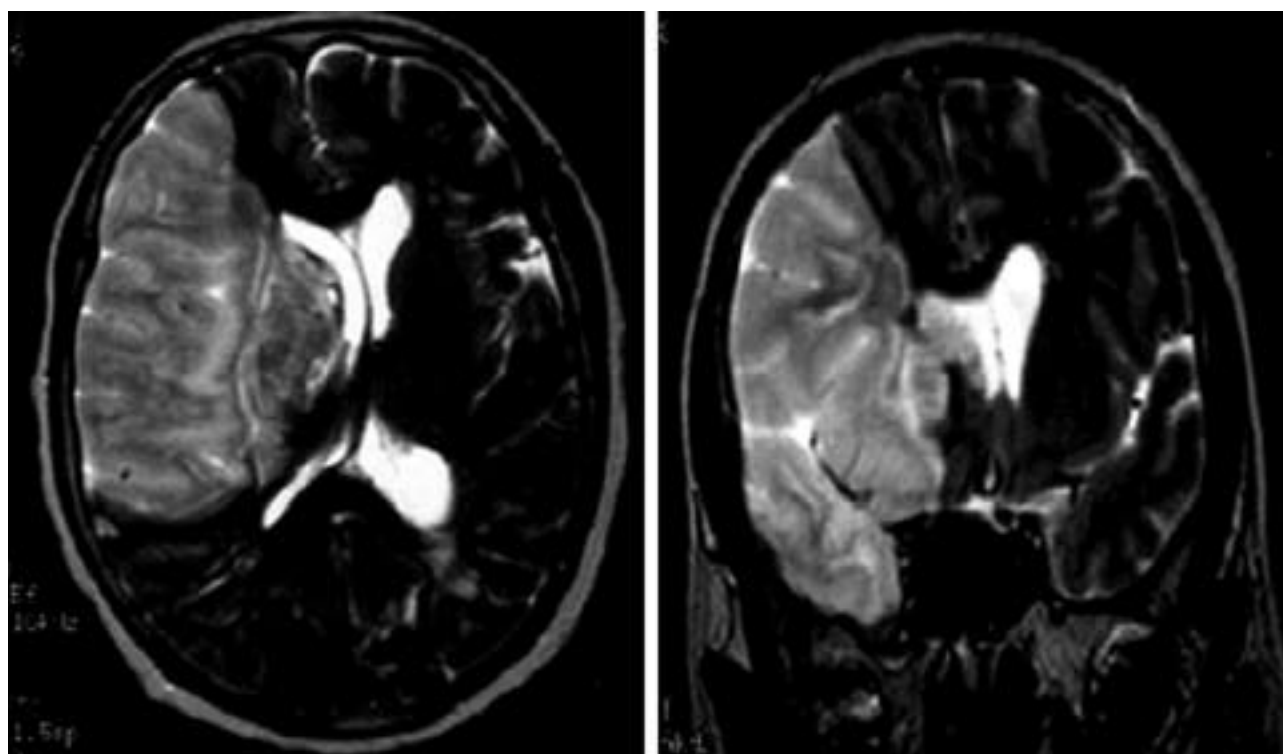


Figure 1. Brain MRI of acute stage of right middle cerebral artery infarction.

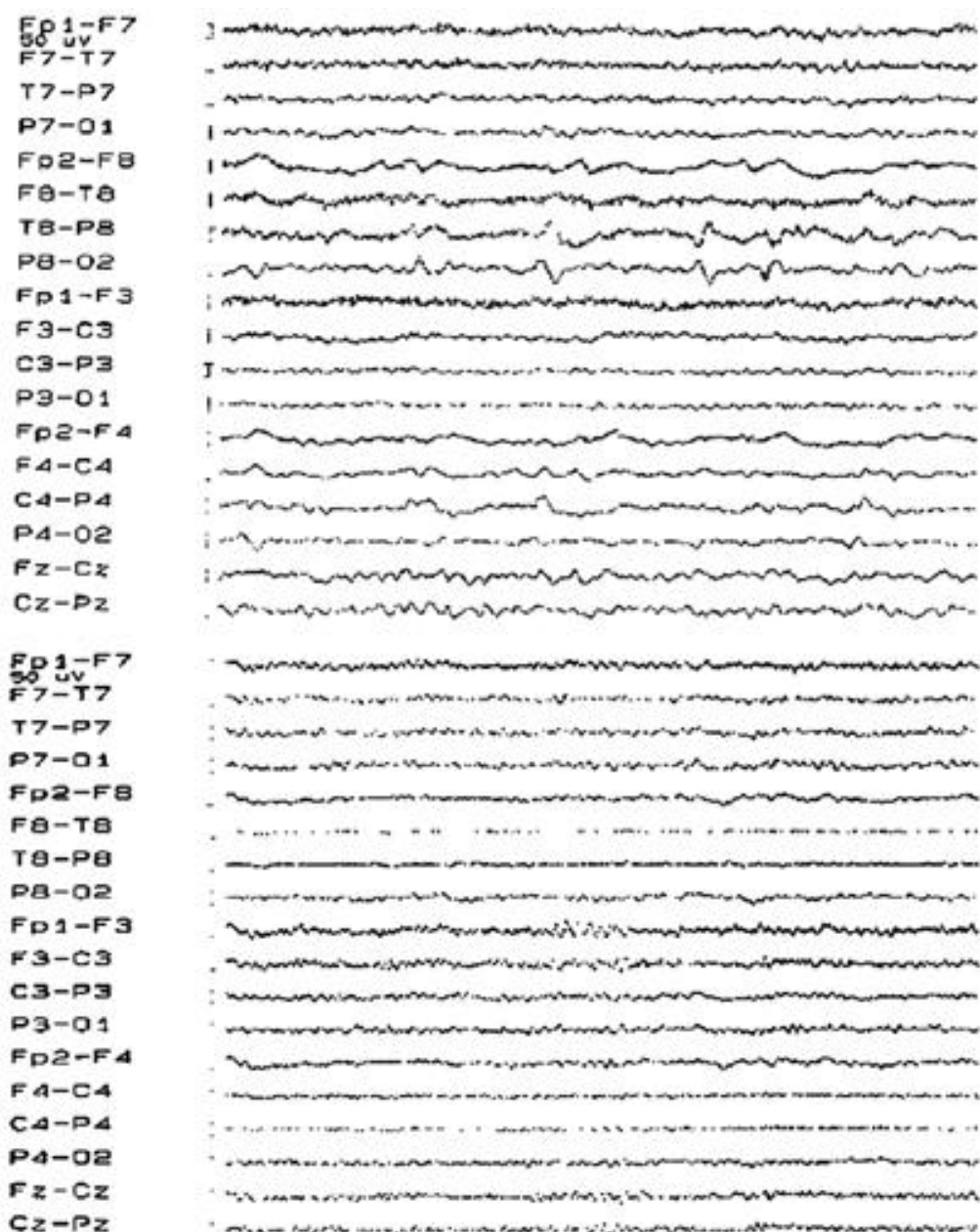


Figure 2. EEG recorded during the continuous right side convulsive movement (upper row) and the recovery state (lower row). Right side limb movements were time-locked with the sharp waves on the EEG.

full clinical expressions of overt generalized convulsions².

In this case, we suggest that this unexpected convulsive movement is a reflection of earlier exhaustion in the right hemisphere or deafferentation of right hemisphere because of preexisting neuronal damage may cause earlier dissociation in the defected brain.

REFERENCES

1. Treiman DM. Subtle generalized convulsive status epilepticus. *Epilepsia* 1984;25:653.
2. Treiman DM. Generalized convulsive status epilepticus in the adult. *Epilepsia* 1993;34 (Suppl 1):S2-S11.
3. Gastaut H. Classification of status epilepticus. In: Delgado-Escueta AV. *Status epilepticus: mechanisms of brain damage and treatment*. New York: Raven Press, 1983.
4. Celesia GG. Generalized status myoclonus in acute anoxic and toxic metabolic encephalopathies. *Arch Neurol* 1988;45:781-784.
5. Engel J. Epilepsy: A comprehensive textbook. In: Treiman DM. *Generalized convulsive status epilepticus*. Philadelphia: Lippin-Raven, 1997.