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Images

Prominent T-wave and ST-segment elevation on electrocardiogram during neonatal seizure

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A female infant weighing 2476 g was delivered at 38 weeks of gestation. Since the infant appeared apneic, mechanical ventilation was started. The infant also showed muscle wasting and hypotonia, conspicuous fasciculations of the lingula, absent motility, and areflexia, which were clearly indicative of severe neuromuscular impairment. In addition, scoliosis, bilateral sensorineural hearing loss, and bilateral cataracts were identified. The laboratory data from blood and cerebrospinal fluid examinations and any genetic test showed normal findings.

On day 23 after birth, the monitor electrocardiogram (ECG) showed prominent T waves with ST-segment elevation after bradycardia in II, III, aVF, V5, and V6 leads (Fig. 1, upper). These changes continued for 15 s. The corrected QT interval was normal (Fig. 1, lower). The patient showed facial flushing before these ECG changes, and SpO_2 was decreased to 70% in 0.3 FiO_2. However, no convulsive movements were detected due to contracture of the extremities. Echocardiography and laboratory findings during these ECG changes were normal.

An electroencephalogram (EEG) demonstrated left temporal lobe dominant origin with a 5- to 6-Hz rhythmic activity, coinciding with the appearance of the prominent T wave on ECG (Fig. 2). This spike wave immediately spread generally and then changed to burst suppression. After about 1 min, both the ECG and the EEG changes returned to normal. We finally considered the prominent T-wave and the ST-segment elevation as a cardiac manifestation of epilepsy. Administration of high-dose vitamin B6, levetiracetam, and zonisamide resulted in the disappearance of the EEG spikes, as well as the ECG abnormalities.

Although several situations are known to result in a prominent T wave on ECG, there is no report about the association between ictal EEG abnormality and prominent T waves on ECG.[1—3] The prognostic significance of these ECG abnormalities in our case in association with sudden

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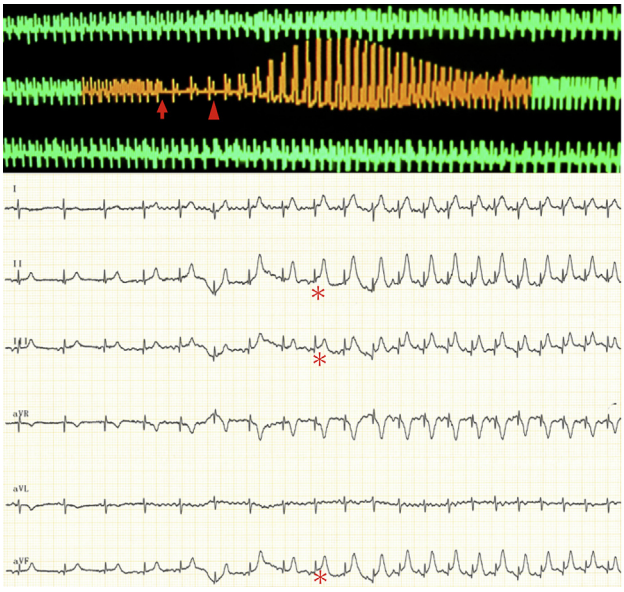

Figure 1 Upper panel: Ictal ECG on the monitor. Ictal ECG started as bradycardia (arrow), with appearance of prominent T waves after a few seconds (triangle). The prominent T wave continued for 15 s. Lower panel: Ictal ECG on the limb lead. The prominent T wave was associated with ST elevation (asterisks).

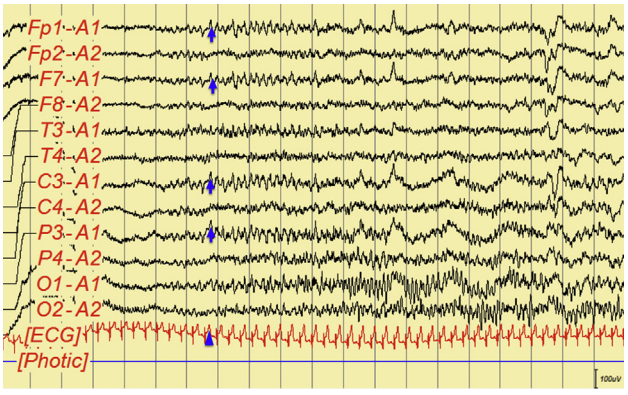

Figure 2 Ictal EEG demonstrating the appearance of a 5- to 6-Hz rhythmic activity predominantly originating from the left hemisphere (arrows), coinciding with the timing of the prominent T wave on ECG (triangle).

unexplained death in epilepsy is unknown, and hence, accumulation of similar cases is necessary.

Conflicts of interest

None.

References

1. Opherk C, Coromilas J, Hirsch LJ. Heart rate and EKG changes in 102 seizures: analysis of influencing factors. *Epilepsy Res* 2002;**52**:117–27.
2. Levis JT. ECG diagnosis: hyperacute T waves. *Perm J* 2015;**19**:79.
3. Sovari AA, Assadi R, Lakshminarayanan B, Kocheril AG. Hyperacute T wave, the early sign of myocardial infarction. *Am J Emerg Med* 2007;**25**:859.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.pedneo.2018.05.007.