

Neurophysiology Quiz

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Notice: Authors are encouraged to submit quizzes for possible publication in the Journal. These may be in any field of Clinical Neurophysiology, and should approximately follow the format used here (maximum of 2 figures). Please address any submissions to the quiz editor: Dr. David B. MacDonald, Head, Section of Neurophysiology, Department of Neurosciences, King Faisal Specialist Hospital & Research Centre, MBC 76 PO Box 3354, Riyadh 11211, Kingdom of Saudi Arabia. E-mail: dbmacdon@yahoo.com

A distinctive EEG pattern

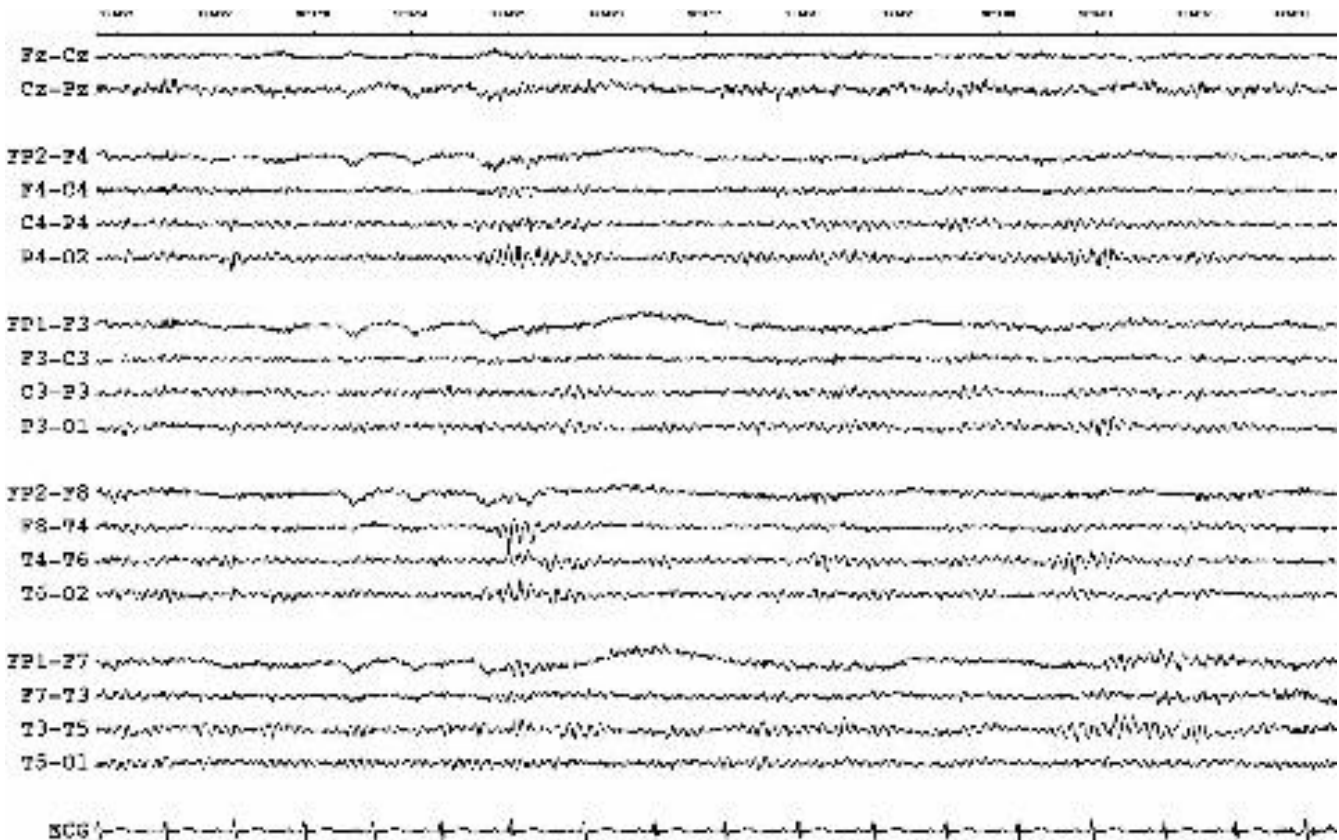
Instructional Objectives

Given a fundamental knowledge of EEG, after studying this quiz the reader should be able to:

1. Apply criteria to identify a distinctive EEG pattern.
2. State its clinical significance.

EEG

Before reading the clinical history, carefully examine this EEG segment (age 46).



Question 1: Without looking at the history, what is the EEG classification?

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Clinical History

This patient had a small parietal cortical venous thrombosis 14 years ago and recovered completely. The event was complicated by a single acute symptomatic convulsion and although there has been no subsequent recurrence, she continues to take carbamazepine. Now there is a suspicion of simple partial seizures because within the last year she has had infrequent central chest feelings of her heart "sinking" without any other associated symptoms.

Question 2: What is the clinical interpretation of the EEG?

Answers

1. Classification: Normal (drowsy). Wicket waves, right temporal.
2. Interpretation: This EEG cannot help to determine the nature of the patient's symptoms. The Wicket waves are a benign variant pattern of no clinical significance.

Discussion

Criteria that identify Wicket waves follow:^{1,2,3} 1. Clusters of mid- or anterior temporal 6-11 Hz negative sharp arciform waves. 2. Isolated wicket waves may arise and morphologically "fit in" to wicket clusters in other segments. 3. No consistent associated slow wave or background disruption (beware random combination with independent intermittent slow activity). 4. Unilateral, bilateral independent or bisynchronous. 5. Occurrence during wakefulness, drowsiness and light sleep. 6. Most common in, but not limited to patients over age 30. The sharp right midtemporal waveforms in the EEG conform to these criteria and are therefore Wicket waves. Note that patient symptomatology is not part of the criteria and should not influence the classification. It is therefore best practice to read and classify the EEG before knowing the clinical history, which can introduce bias to make the EEG a less than independent test. Also note that the bipolar phase reversal at T4 merely localizes the waveform and has no significance for the classification of any EEG finding. Despite its resemblance to epileptiform abnormalities, the distinctive Wicket wave pattern is not associated with seizures and therefore must be correctly identified to avoid potentially harmful misdiagnosis or misclassification. It is an incidental finding that does not clarify diagnosis. This patient may or may not have simple partial seizures, but the EEG result cannot and should not be used to decide.

Teaching Points

1. Specific criteria identify the Wicket wave benign variant pattern.
2. This distinctive pattern must be correctly identified and then excluded from clinical diagnosis because it is not associated with seizures.

References

1. Reiher J, Lebel M. Wicket spikes: clinical correlates of a previously undescribed EEG pattern. *Can J Neurol Sci* 1977; 4: 39-47.
2. Westmoreland BF. Benign variants and patterns of uncertain significance. In: Daly DD, Pedley TA, editors. Current practice of clinical electroencephalography. 2nd ed. New York: Raven Press; 1990. p. 243-252.
3. MacDonald DB. Normal EEG and benign variants. *Neurosciences* 2003; 8 Suppl 2: S110-S118.