

Eye Movements During Sleep Recording

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The sleep physician often encounters artifacts in eye movements. Many of these can be physiologic (patient blinking and reading). Others can originate from faulty recordings or from abnormal eye movements intrinsic to the patient. This is a presentation of some interesting cases asking the reader to match each patient with his or her respective sleep recording. The answers follow the figures.

Please match the following cases with the figures that follow

Patient A

A 49-year-old woman presented for a diagnostic polysomnogram for evaluation of choking episodes at night and hypersomnia. She had a history of chronic insomnia, and, before going to bed at night, she watched television or read a book in bed to try and relax.

Patient B

A 52-year-old man presented for evaluation of dream-enactment behaviors. The video portion of his nocturnal polysomnogram demonstrated flailing of both arms associated with shouting and screaming. He had had a left eye enucleation following blunt trauma.

Patient C

A 38-year-old woman with a past medical history of depression presented for a sleep study for evaluation of daytime sleepiness and snoring. Her medications include fluoxetine (Prozac®).

Patient D

A 41-year-old woman presented for evaluation of snoring, witnessed apneas, and daytime sleepiness. At the age of 20, she suffered a knife injury to her right orbit and face and subsequently had multiple surgeries for this. On cranial nerve examination, her extraocular movements were full on the left. On the right, she was found to have third, fourth, fifth, and sixth cranial nerve damage with some aberrant regeneration of the third and sixth cranial nerves.

Disclosure Statement

Dr. Avidan has indicated no financial conflict of interest.

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Figure 1

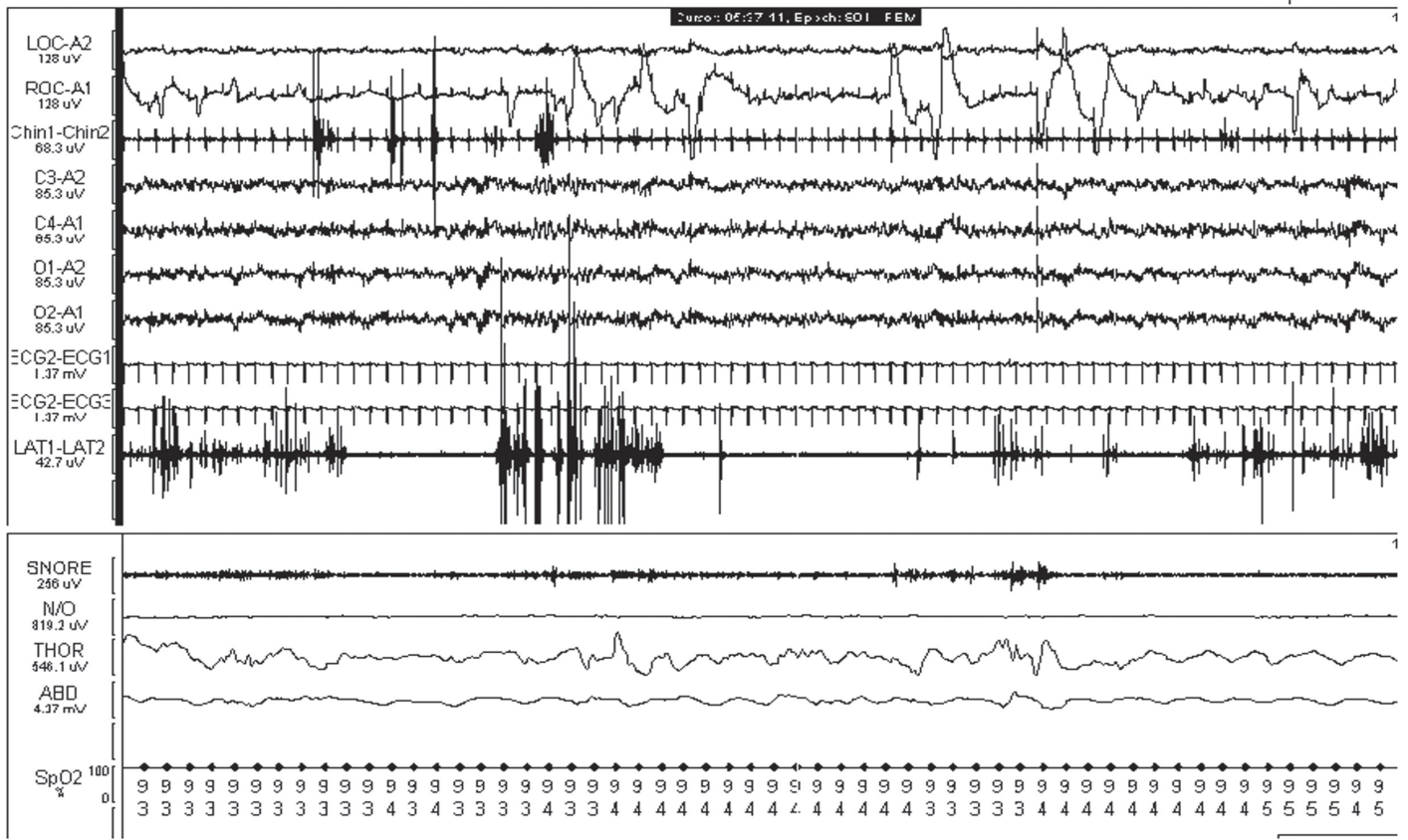


Figure 2

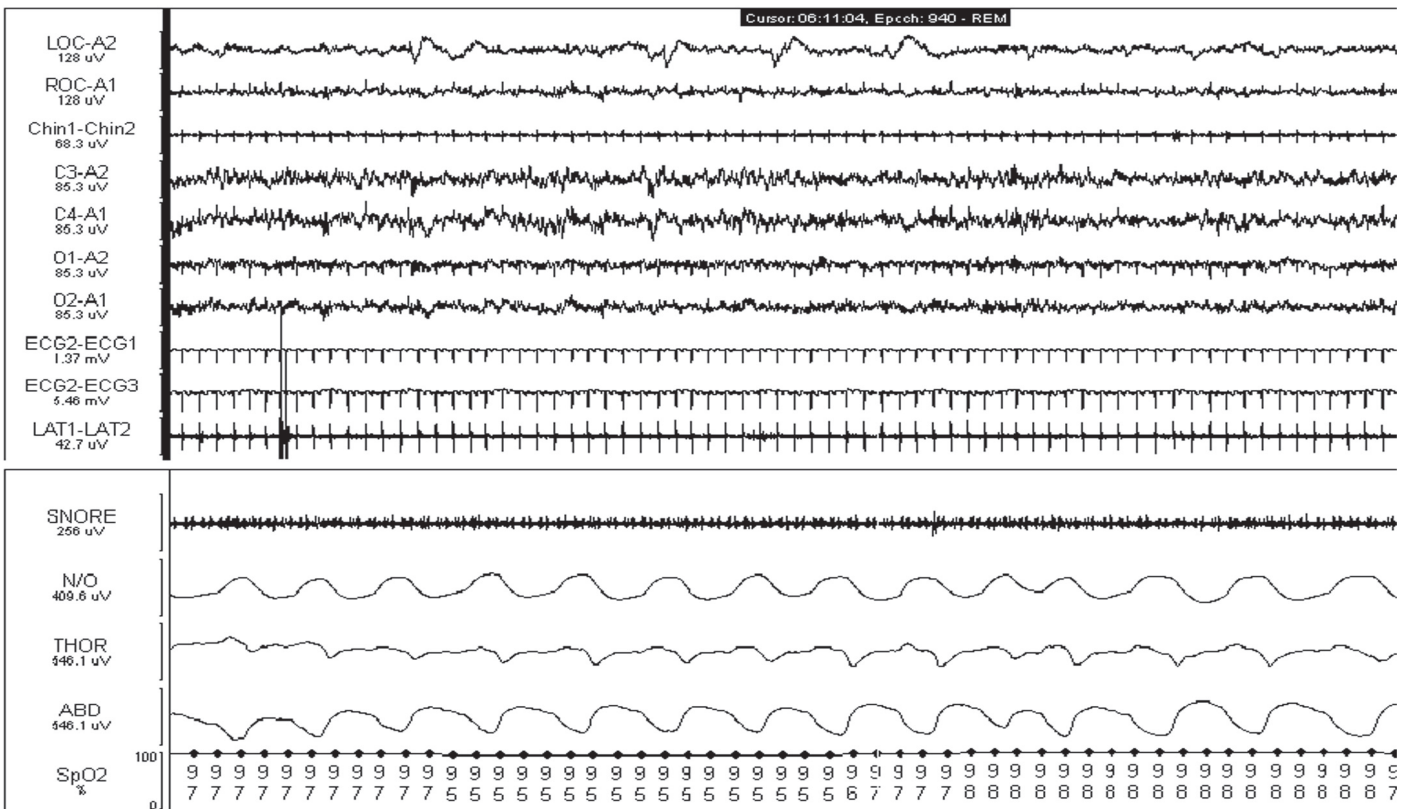


Figure 3

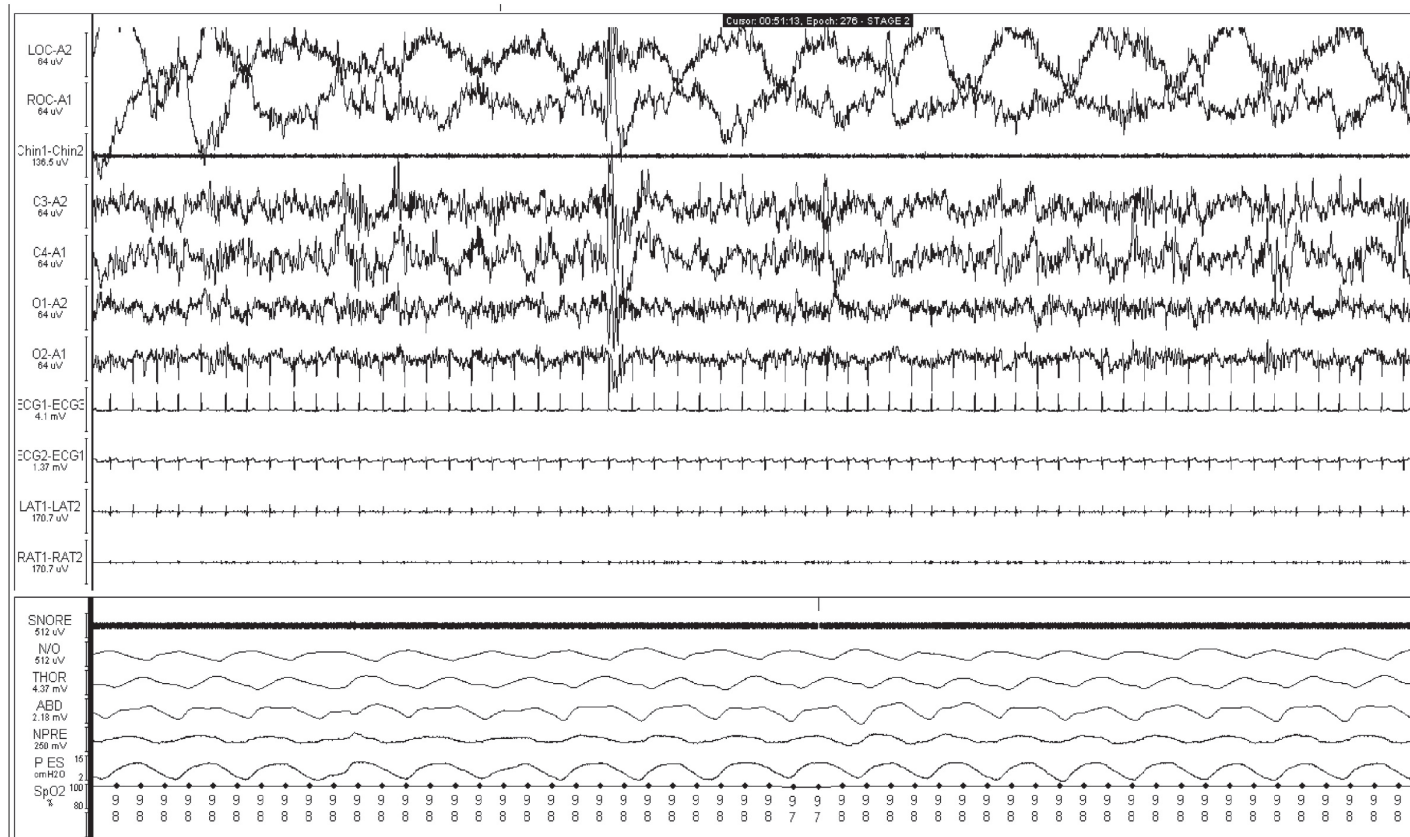
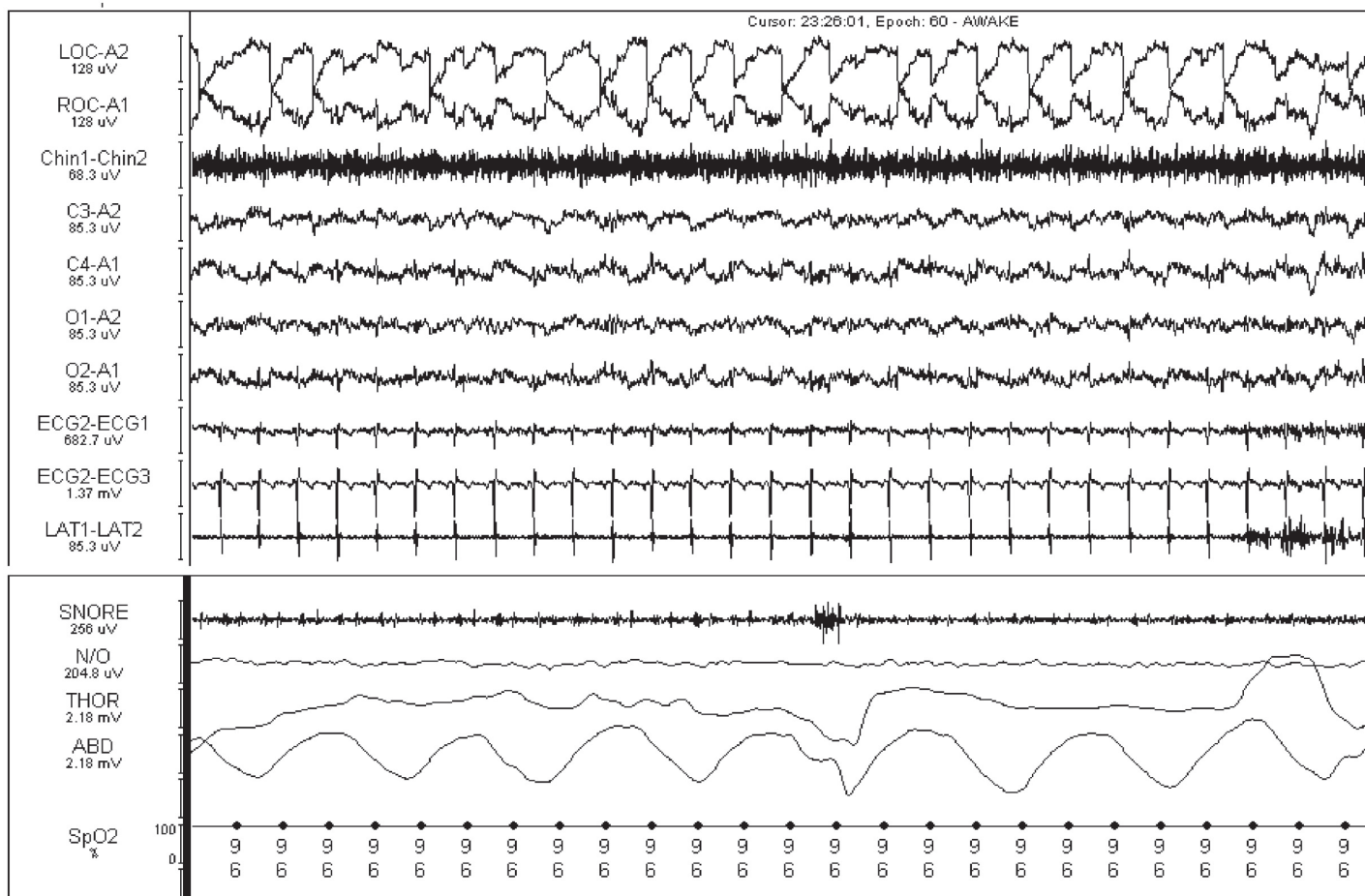


Figure 4



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ANSWERS

Patient A: Figure 4
 Patient B: Figure 1
 Patient C: Figure 3
 Patient D: Figure 2

DISCUSSION

Patient A's polysomnogram (Figure 4) demonstrates the typical eye movements associated with reading signal. Noted in the electrooculogram channels are the repetitive rhythmic pattern consistent with reading at the rate of 30 lines per minute.^{1,2}

Patient B had had a left eye enucleation, which registers as loss of the left electrooculogram signal (Figure 1). The recording takes place during rapid eye movement (REM) sleep during one of his characteristic dream-enactment episodes. The electromyographic tone of the anterior tibias muscle is also abnormally augmented, consistent with his underlying diagnosis of REM sleep behavior disorder.

Patient C's tracing reveals the so-called "Prozac eyes" noted in the electrooculogram channels (Figure 3). Noted are prominent eye movements during stage 2 non-REM (NREM) sleep. Prozac eyes have been described in patients taking selective serotonin reuptake inhibitors such as fluoxetine.³ The effect of fluoxetine on non-REM eye movements is postulated to derive from potentiation of serotonergic neurons that inhibit brainstem "omnipause neurons," which, in turn, inhibit saccadic eye movements, thus resulting in disinhibited release of saccades.⁴

Patient D's tracing (Figure 2) is similar to that of patient B in that there is only a single REM during REM sleep (absence of the right electrooculographic signal), consistent with her underlying right oculomotor cranial nerve dysfunction.

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