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EMG Vagus Nerve Stimulator Artifact

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ABSTRACT

EMG artifact produced by a VNS stimulator is described. A patient with a VNS stimulator underwent an EMG study for suspected ALS. Artifacts that appeared similar to positive sharp waves or fibrillations were noted that could produce a false clinical diagnosis. These VNS-EMG artifacts matched well with the VNS generator's set parameters. We conclude that EMG findings must be interpreted with caution in patients with VNS implants, and also that EMG may have a possible monitoring value for VNS activity.

Search Terms: EMG, VNS, artifact, vagus nerve stimulator, electromyography, fibrillations, positive sharp waves

IMAGE DESCRIPTION AND CLINICAL RELEVANCE

A 47 year-old man was studied in the EMG laboratory for suspected ALS. The patient had a history of medically intractable epilepsy treated with a Vagus Nerve Stimulator. An unusual pattern of waveforms was recorded on the resting needle EMG. Biphasic waveforms measuring 0.5-1.5 mV in amplitude and 5-10 ms in duration, firing with a very regular frequency were noted. The waveforms were variable in morphology; they had sharp turns, and always consisted of an initial brief spike and a second phase of longer duration and opposite polarity. When recorded from the left sternocleidomastoid (Illustration), these waveforms assumed the configuration of positive sharp-waves that had characteristic sharp, loud, clicking sound on EMG, easily distinguished from sounds produced by genuine fibrillations or positive sharp waves.

In this patient, such waveforms were recorded mainly from the left neck and upper arm muscles, anatomically close to the location of the VNS impulse generator (left upper chest). The potentials' firing rate was 20Hz, precisely matching the set frequency of the patient's VNS. The waveforms were present for 30 seconds and absent for 3 minutes, again matching VNS generator's set firing parameters. This unusual pattern of waveforms represents VNS artifact on EMG. VNS artifact on EEG has been reported previously (Olejniczak et al., 2001).

REFERENCES

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