

Ictal bradycardia after endovascular treatment of an aneurysm

Case illustration

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Seizures as a cause of bradycardia are rarely considered in the neurosurgical intensive care unit (NICU) and may only be diagnosed with simultaneous electrocardiography (EKG) and electroencephalography (EEG) monitoring.

This 67-year-old woman presented to us 1 week after having undergone Guglielmi Detachable Coil embolization of a left supraclinoid internal carotid artery aneurysm. She had experienced two to three episodes of seizures along with severe bradycardia (heart rate 20 bpm). There was no history of cardiac illness or use of cardioactive drugs. On examination, she had a Glasgow Coma Scale score of 15 and mild conductive aphasia. Magnetic resonance studies revealed hyperintensities on T₂-weighted images in the left temporal lobe and left basal ganglia, with the aneurysm abutting the temporal lobe on coronal images (Fig. 1). She was started on a regimen of sodium valproate.

Simultaneous video EKG/EEG monitoring recorded a left temporal lobe seizure accompanied by severe bradycardia lasting 53 seconds (Fig. 2). The lowest heart rate recorded during monitoring was 22 bpm. The patient refused to undergo implantation of a cardiac

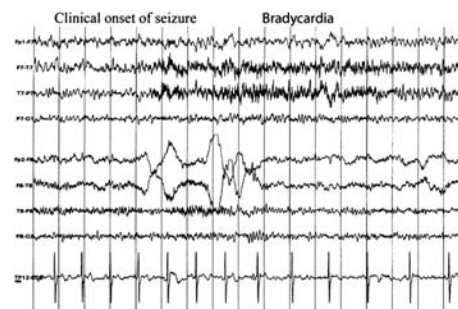


FIG. 2. Simultaneously obtained EKG/EEG tracings showing the sudden appearance of left temporal lobe activity followed by bradycardia.

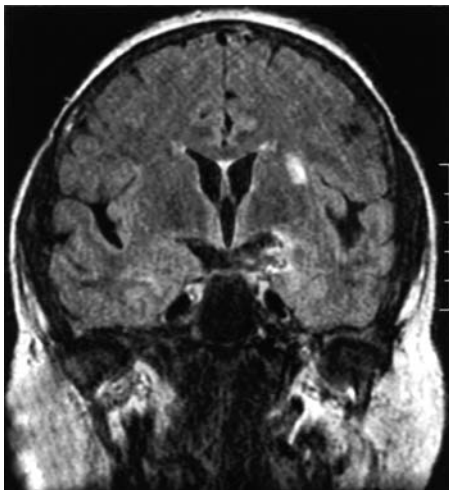


FIG. 1. Coronal MR image demonstrating an internal carotid artery aneurysm abutting the temporal lobe. The abnormal signal in the left temporal lobe is partially obscured by a coil artifact. Note also the small infarct in the subcortical parietal lobe.

pacemaker. She has experienced no other seizure during a 1-year follow-up period.

Ictal arrhythmias presumably develop from the propagation of seizure activity to the central autonomic network (CAN), which regulates autonomic visceromotor output.¹ The CAN consists of the insular cortex, amygdala, central nuclei, and portions of the hypothalamus. Cardiac pacing may be indicated because seizures are refractory to medication in 40% of patients and bradyarrhythmias are potentially fatal.² Ictal bradycardia may occur in left hemisphere or temporal lobe seizures.^{3,4} To our knowledge, this is the first report of ictal bradycardia following endovascular therapy for an aneurysm. The contents of this report emphasize the importance of considering an ictal cause of bradycardia in patients in the NICU.

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