Case Report

Basilar artery occlusion presenting as refractory status epilepticus

Kishan Raj \textsuperscript{a,\*}, Gourav Goyal \textsuperscript{b}

\textsuperscript{a} Department of Neurology, Saket City Hospital, New Delhi, India
\textsuperscript{b} Department of Neurology, Mahatma Gandhi Medical College, Sitapura, Jaipur, Rajasthan, India

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Abstract

Seizures secondary to brainstem stroke are rare and only few case reports are available in literature. Only one case of status epilepticus has been reported in the brainstem stroke. We report in best of our knowledge the first case of refractory status epilepticus in the brainstem stroke and review the relevant literature. We present a case of 45-year-old hypothyroid female presented with loss of consciousness followed by generalized tonic-clonic seizures which turned out into refractory status epilepticus as benzodiazepines and antiepileptic drugs were ineffective. Magnetic resonance imaging and angiography of brain revealed basilar artery occlusion with infarcts of midbrain, bilateral thalami and cerebellum without cortical involvement. Emergency physician should be aware of this unusual presentation of brainstem stroke as timely intervention for stroke can improve the outcome.

Keywords: Brainstem; Stroke; Seizure; Status epilepticus

1. Introduction

Stroke-associated seizure (SAS) usually manifests because of cortical involvement by ischemic or hemorrhagic events, though cases of SAS have been reported with subcortical involvement.\textsuperscript{1,2} SAS has been categorized into three types i.e., onset, early and late seizures according to temporal relation between onset of stroke and seizure.\textsuperscript{3,4} Onset seizure poses a diagnostic challenge as it mimics toddler's palsy.\textsuperscript{5} Seizures secondary to brainstem stroke are rare and only few case reports are available in the literature.\textsuperscript{6,7} Only one case of status epilepticus (SE) is available in the literature in the brainstem stroke.\textsuperscript{7} We report in best of our knowledge the first case of refractory status epilepticus in the brainstem stroke.

2. Case report

45-year-old hypothyroid female was found unconscious in the market. She was brought in emergency room (ER) in confused state. She had no history of fever, headache, seizure or head trauma. There was no past history of tuberculosis, stroke or seizure disorder. On examination, she was confused with abnormal jerky movement of all 4 limbs. Her vitals were normal with asymmetrical pupils without any apparent facial asymmetry or any limb weakness, neck rigidity and Kernig's sign were absent. Her plantar reflex were bilaterally extensor. She had an episode of vomiting in ER. It was initially thought that she was in postictal confusion. She was immediately taken for CT scan of the brain which was normal. Her initial blood parameters i.e., hemogram, erythrocyte sedimentation rate (ESR), serum electrolytes, liver and kidney function tests were within normal limit. Within one hour of admission, she developed tonic-clonic movement of all the four limbs. Despite injection midazolam (3 times), she continued to seize.
Subsequently, loading dose of phenytoin (20 mg/Kg) was given but it did not help. Further, injection valproate was given according to her weight but it didn't help her too. She was having refractory status epilepticus and ultimately she was given continuous infusion of thiopental and midazolam with which seizures got controlled after 6 hours of infusion. She was continued with these infusions for next 24 hrs. Subsequently, midazolam and thiopental infusions were tapered within next 12 hours. Once patient's condition stabilized, a magnetic resonance imaging (MRI) of brain was done which showed acute infarcts in bilateral cerebellar hemispheres, midbrain and bilateral thalami, pertaining to territory of basilar artery and its branches. Magnetic resonance angiography (MRA) of neck and intracranial vessels revealed acute thrombosis of distal basilar artery. In view of delayed diagnosis and well-formed infarcts, it was decided not to go for any active intervention like intravenous thrombolysis or intra-arterial retrieval of thrombus. She was started on antiplatelet drugs. After 1 week, she was weaned off from ventilator. She was quadriplegic with intact brainstem reflexes. Her 2D-Echocardiography, 24 hours Holter study, protein C, S, anti-thrombin III and other coagulation parameters were normal. Anti-cardiolipin antibody and lupus anticoagulant titers were negative. At 3 months follow up, patient remained quadriplegic with intact brainstem reflexes. She had opening of eyes with painful stimulus, and spontaneous grimacing of face and crying were present (see Fig. 1).

3. Discussion

Seizure as initial presentation of stroke is rare. It is present in only 2% cases of stroke in one stroke registry. The rate of seizures after stroke varies widely from 2.7% to 42.8% in the published literature. Incidences of seizure in different subtypes of stroke are given in Table 1. Seizures are more common with anterior circulation stroke and rare in posterior circulation stroke. Status epilepticus as initial presentation of posterior circulation stroke is very rare and reported once by Gadoth A et al, but refractory status epilepticus is not reported. Seizures are more common with cortical involvement by ischemic or hemorrhagic events. Exact mechanism of seizure in posterior circulation stroke is not well defined. According to penfield's "centocephalic theory", the brainstem is the source of seizures. Exact mechanism of the seizure in the acute phase of

Fig. 1. [A] MRI of the brain (Diffusion weighted image) shows hyperintensities (diffusion restriction) in bilateral thalami and. [B] of midbrain and cerebellar vermis, [C] 3D TOF MR Angiography (MRA) shows occlusion of basilar artery (white arrow) after union of the vertebral arteries. Rest of MRA did not reveal other abnormalities like aneurysm, vascular malformation or stenosis of other intracranial vessels.
stroke is unclear but may be related to the acute focal metabolic derangement including local acidosis, brain edema, and altered electrolyte balance and altered neurotransmitter activity. Our case characterizes atypical presentation of posterior circulation involvement. Most common etiologies of status epilepticus are low blood concentrations of antiepileptic drugs in patients with chronic epilepsy, stroke, traumatic brain injury, brain tumors, central nervous system (CNS) infections, metabolic or toxic encephalopathies, and electrolyte disorders. Refractory status epilepticus (RSE) is defined as status epilepticus that continues for up to 2 hours despite treatment with benzodiazepines and one antiepileptic drug. Refractory SE (RSE) is most often symptomatic of an acute neurologic condition (stroke, traumatic brain injury, CNS infections) or neurodegenerative disease.

The management of the acute stroke is time dependent and needs to be treated early to improve survival and limit disability. In conclusion, this case demonstrates that acute basilar artery thrombosis can present primarily as refractory status epilepticus though rare. Stroke is a medical emergency, if diagnosed early, appropriate therapy can be introduced timely to improve the outcome. An emergency physician should always keep basilar artery thromboses as one of the differentials in patients presenting with status epilepticus. In our view in such patients diagnostic evaluation (MRI brain study) should be continued simultaneously with the treatment of status epilepticus.

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References