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A Case of *Vibrio Vulnificus* Infection Presenting with Fatal Bacterial Encephalitis

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Dear Editor,

Vibrio vulnificus (*V. vulnificus*) is a Gram-negative anaerobic rod that usually induces wound infection and gastroenteritis, and often results in a fatal septic condition, especially in patients with chronic disease such as alcoholic liver disease, chronic renal failure, and diabetes, and in those taking immunosuppressants.[1,2] It rarely causes meningoencephalitis.[2-5] Here we report a patient presented with fatal *V. vulnificus* encephalitis with localizing brain lesions.

A 73-year-old male was admitted with sudden alteration of his mental state following 2 days of myalgia and chilling sensation during late August. At presentation, his vital signs were stable (blood pressures of 103/59 mm Hg, heart rate of 90/min, and body temperature of 37.3°C). A physical examination revealed mild swelling of the left ankle that was thought to be associated with a sprain that occurred when he had tripped over a few days previously. His medical history was not remarkable other than previous cholecystectomy and bilateral hip replacement surgeries. He was a farmer and chronic alcoholic living in Hapdeok-eup, Dangjin, Chungnam Province. His family denied that he had recently visited a coastal area or had consumed raw seafood. He was stuporous and had anisocoric pupils with sluggish light reflex, quadriparesis, and bilateral Babinski signs. Laboratory tests showed anemia and severe thrombocytopenia. Brain MRI revealed bilateral lesions in the basal ganglia and midbrain (Fig. 1).

Meropenem and vancomycin were started to treat presumptively diagnosed bacterial meningoencephalits without spinal tapping. A CSF study was not performed due to severe thrombocytopenia. On the second day he became comatose with the loss of brainstem signs. On the third day, diffuse purpuric patches with large bullae developed on his left leg, which were compatible with necrotizing fasciitis. The antibiotics were switched to ceftriaxone, ciprofloxacin, and doxycycline. However, multiorgan failure with metabolic acidosis continued, and he died on the 4th day of admission, at which time *V. vulnificus* was isolated from the blood.

The initial clinical manifestation and the patient's uncertain history of exposure to seawater and seafood resulted in *V. vulnificus* infection not being suspected, especially given the absence of a conspicuous skin wound. The subsequent development of hemorrhagic necrotic bullae on his leg lead to the delayed diagnosis of *V. vulnificus* infection. The currently recommended antibiotics treatment regimen for *V. vulnificus* is ceftriaxone plus doxycycline or ceftriaxone plus ciprofloxacin.[5,6]

V. vulnificus infection is a life-threatening condition that is not uncommon between June to November in coastal areas of South Korea.[5] CNS involvement is rare in *V. vulnificus* infection. Most cases are fatal, and in all recorded fatal cases the patients were immunocompromised.[2-5]

Previous reports include a middle-aged patient with meningitis, no skin lesion, and good

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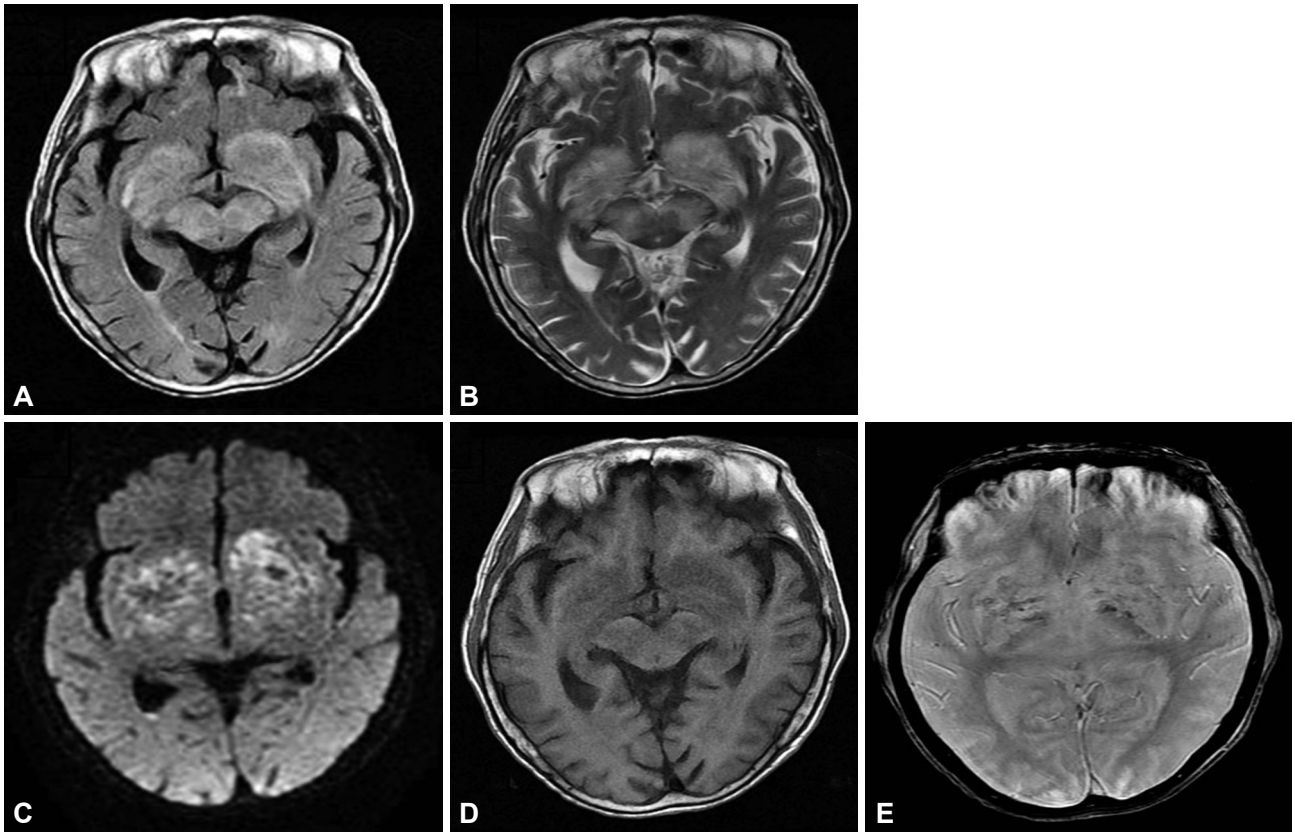

Fig. 1. Brain MRI findings. Bilateral basal ganglia and midbrain including red nucleus, crus cerebri, and substantia nigra showed almost symmetrical lesions with hyperintensities in fluid-attenuated inversion recovery (A), T2-weighted image (B), diffusion-weighted image (C), and hypointensities in T1-weighted image (D). Gradient echo (E) showed low signal lesions suggesting petechial hemorrhage in bilateral basal ganglia.

recovery, as well as a 69-year-old patient with clinical features similar to the present one, except for the previous consumption of raw fish.[3,4] The latter patient also developed a delayed skin lesion.

The midbrain including the substantia nigra and red nucleus, as well as the basal ganglia seem to be vulnerable areas for this microorganism, based on the present case and a previous one.[3] The bacterium reportedly uses iron stores for overgrowth,[7] and the iron concentration is higher in those areas than in other brain regions.

As our case, patients with *V. vulnificus* infection can present to neurologists with meningoencephalitis with characteristic brain lesions. Even without a documented immunocompromising condition and preceding typical necrotizing fasciitis, *V. vulnificus* infection should be suspected for patients presenting with midbrain and basal ganglia lesions and a septic condition. Such lesions in brain MRI could be an important clue for an early diagnosis of this fatal condition before blood cultures reveal the organism.

Author Contributions

Conceptualization: Jee Hyun Kim. Data curation: all authors. Writing—original draft: Yong Woo Lee. Writing—review & editing: Jee Hyun Kim.

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Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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