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## ALLERGIC ENCEPHALITIS WITH GELASTIC STATUS EPILEPTICUS INDUCED BY WASP STING

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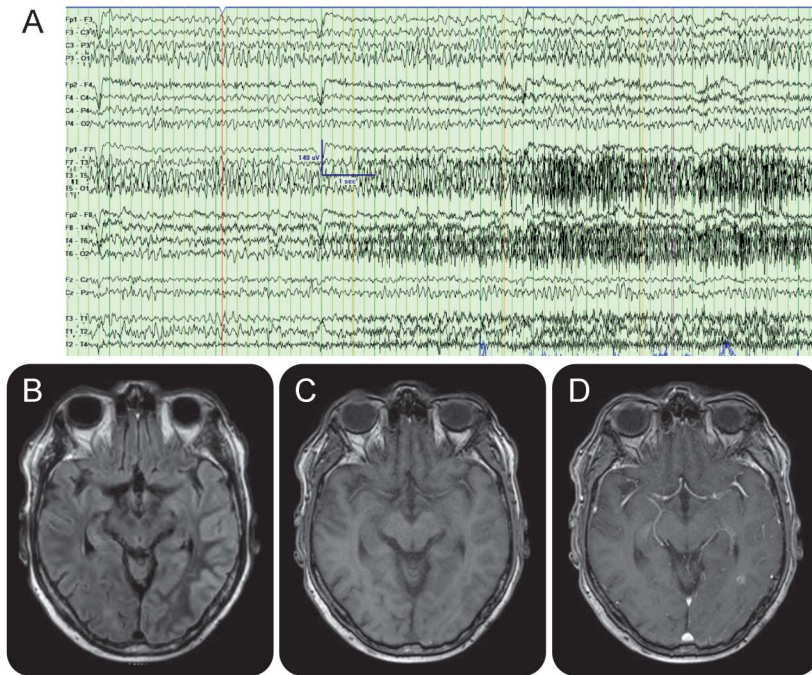
Wasp stings are ubiquitous worldwide and generally cause self-limiting local reaction. Occasionally more serious systemic reactions such as anaphylaxis, rhabdomyolysis, and intravascular hemolysis may occur, especially with multiple stings.<sup>1–3</sup> Although exceedingly rare, neurologic complications of the wasp sting have been described.<sup>3–6</sup> We report a case of allergic encephalitis with gelastic status epilepticus (SE) due to a delayed reaction to the wasp venom.

**Case report.** A 49-year-old right-handed white man with a history of left cerebellar medulloblastoma resected 10 years prior with no residual neurologic deficits presented with a worsening left-sided headache after being repeatedly stung by a swarm of wasps in the left head and neck area, including the site of previous craniotomy with a skull defect. The patient had had wasp stings in the past with only transient local reaction. On day 7 he developed generalized tonic-clonic seizures (GTCS). Brain MRI was unremarkable and CSF showed only elevated protein of 82 mg/dL. Additional CSF tests, including oligoclonal bands, were negative. The patient continued to have persistent headache, GTCS, and fluctuations in mental status and was admitted to Tampa General Hospital on day 14. He was found to have speech with paraphasic errors and anomia, right homonymous superior quadrantanopia, and brisk deep tendon reflexes with bilateral Babinski sign. He was observed to have stereotypical episodes lasting 3–5 minutes with right gaze deviation and head turn, visual hallucinations, and nonsensical speech and laughter, consistent with gelastic seizures. EEG showed focal SE arising from the left temporal region (figure, A). Repeat brain MRI with and without contrast showed T2 hyperintensities in the left temporo-occipital areas and a 6-mm enhancing lesion in the left temporal region (figure, B–D). Magnetic resonance angiography of the head showed segmental stenosis concerning for vasculitis; however, cerebral angiography was normal. Immunoglobulin E (IgE) antibody levels to *Polistes* species (paper wasp) showed class 4 elevation (very high) of 26.50 kU/L (normal range: <0.35 kU/L, radioallergosorbent test).

The patient was treated with high-dose IV steroids and his seizures were refractory, requiring multiple anticonvulsants. He recovered and was discharged with mild residual cognitive dysfunction. Repeat MRI brain performed 2 months after the event showed resolution of the acute findings. Eighteen months later he continues to have mild cognitive dysfunction and is still on anticonvulsants.

**Discussion.** The insects of Hymenoptera order (wasps, bees, and ants) deliver their venom by stinging the victim. The venom of different species is biochemically and immunologically distinct, although cross-reactivity between some species has been reported.<sup>1,2</sup> Wasp venom contains an array of vasoactive, inflammatory, and thrombogenic peptides, amines, and enzymes.<sup>1,2</sup> Low-molecular-weight compounds such as serotonin, histamine, acetylcholine, and kinins mediate direct toxic effects. Phospholipase A induces mast cell degranulation with release of vasoactive mediators, while hyaluronidase allows venom to disseminate. Reaction to venom may be local, regional, systemic anaphylactoid, and delayed-type hypersensitivity.<sup>1,2</sup> The venom of insects belonging to order Hymenoptera (wasps, bees, and ants) induces acute IgE-mediated type I hypersensitivity or type III reaction with deposition of immune complexes and complement activation. These reactions are more delayed and occur days to weeks after the venom inoculation. Our patient had previous exposure to the wasp venom and was likely sensitized. We speculate that IgE formed by previous sensitization to venom cross-reacted with neuronal structures, resulting in the development of allergic encephalitis.

Neurologic manifestations of Hymenoptera stings are uncommon, but several cases have been reported worldwide involving both central and peripheral nervous system, including stroke, encephalitis, cranial neuropathies, acute inflammatory polyradiculoneuropathy, and myasthenia gravis.<sup>3–6</sup> There have been only 3 reports of wasp sting-induced allergic encephalitis worldwide (2 in Russia and 1 in India).<sup>4–6</sup> Similar to our case, clinical presentation in one of the reports included headache and seizures and response to steroids was observed.<sup>4</sup> It is interesting that our patient presented with gelastic seizures. Although classic with hypothalamic hamartoma, gelastic



(A) EEG showing focal seizure activity originating in the left temporal lobe. (B) Axial fluid-attenuated inversion recovery sequence of brain MRI showing hyperintensities in the cortex of the left temporo-occipital areas. (C, D) Axial T1 brain MRI without and with contrast showing 6-mm enhancing lesion in left temporal lobe.

seizures may be associated with different cortical foci—frontal, temporal, and parietal.<sup>7</sup>

In summary, we describe a novel case of wasp sting–induced encephalitis confirmed serologically by a specific IgE. Clinical presentation included gelastic SE—an association of 2 rare conditions. Wasp stings occurred in the area of postcraniotomy skull defect, and we hypothesize that this may have facilitated direct passage of the venom into the brain and thus rendered the CNS more accessible.

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