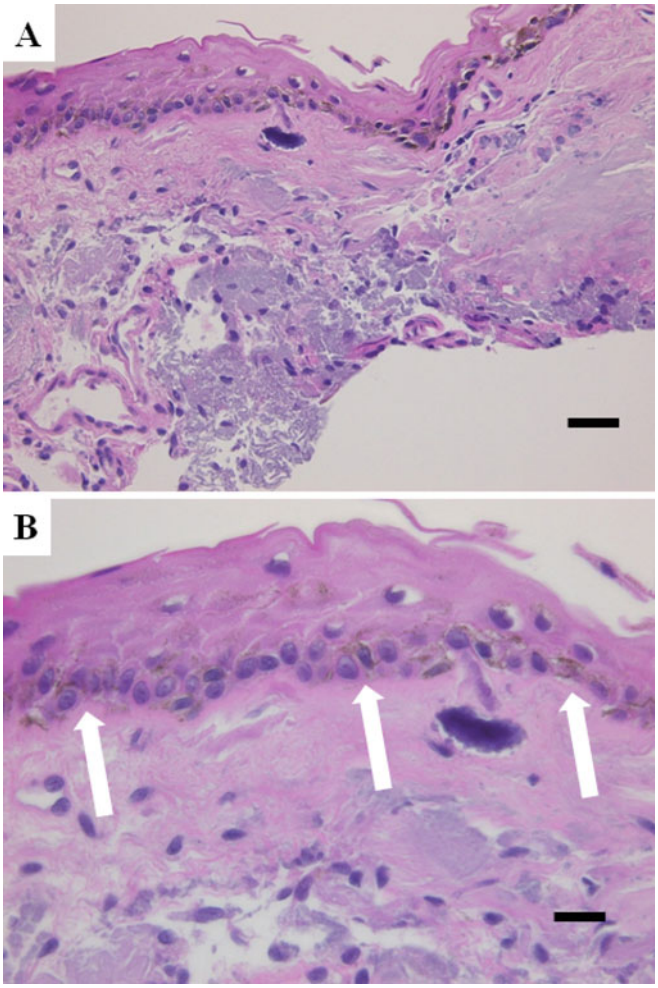

Figure 2A, B. Histopathology (H&E stain). **A** The excised conjunctival limbus in the left eye (bar = 200 μm). **B** Magnified view showing melanosis *(arrows)* of basal layer in the conjunctival limbus (bar = 100 μm). The histological findings showed that there were pigment cells with melanin in the basal layer and distinguished malignant melanoma from melanosis in the irregular expansion of the pigment cell layer.

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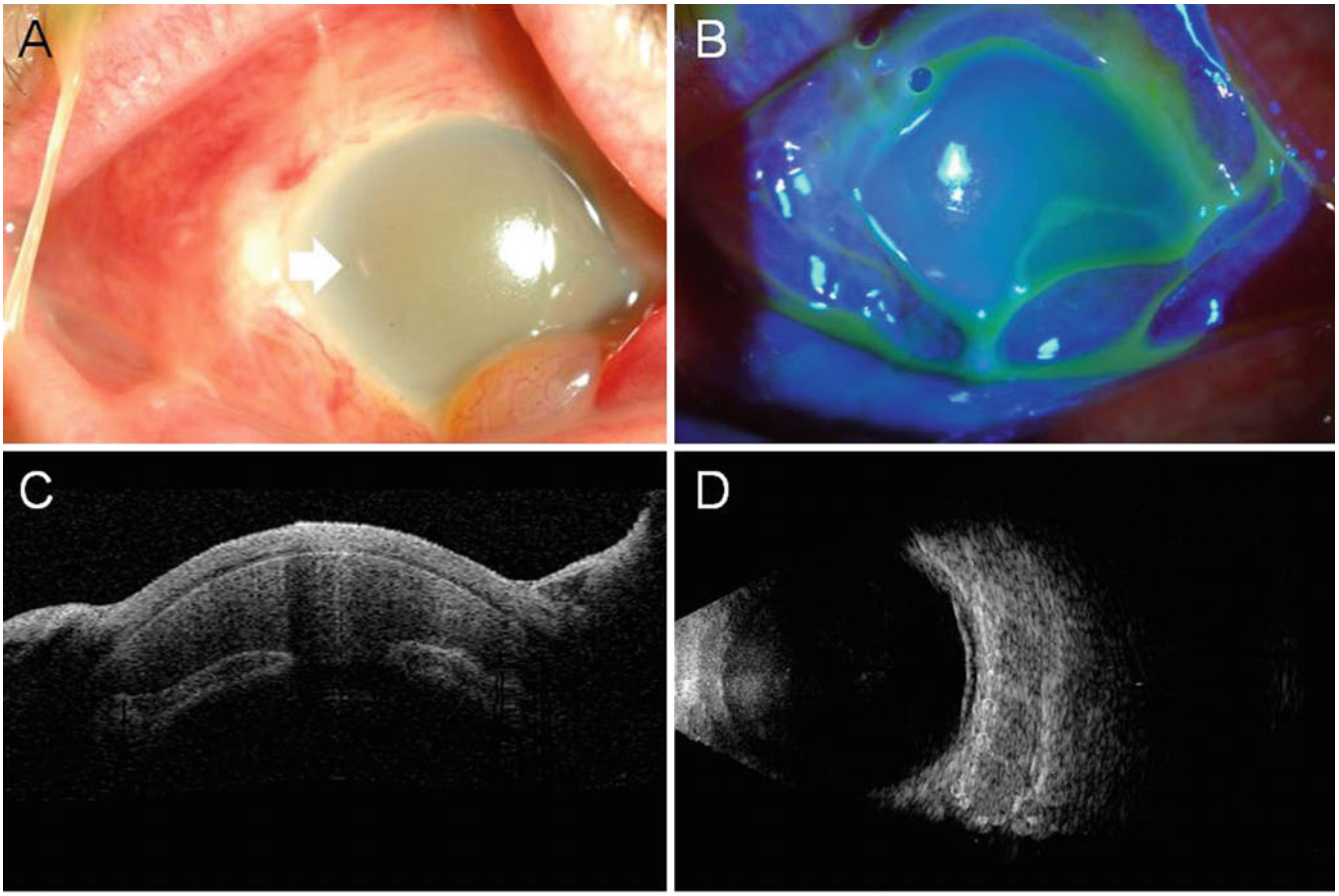
Corneal Wasp Sting Accompanied by Optic Neuropathy and Retinopathy

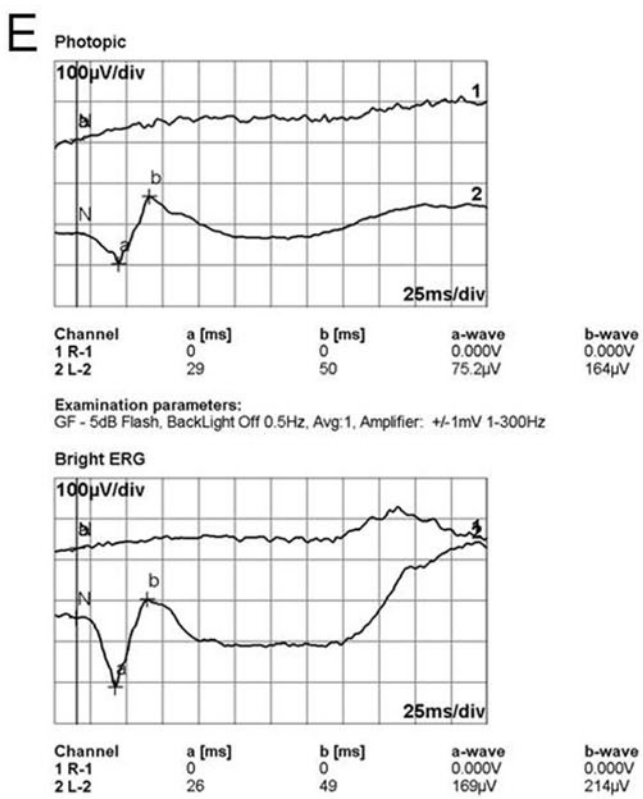
Insect stings are common injuries. Bee and wasp corneal stings are reported to induce inflammation of the eye with minor impairment. Different from previous reports, we found that a corneal wasp sting caused acute corneal decompensation accompanied by optic neuropathy and retinopathy, resulting in permanent visual impairment and phthisis. We report a case of severe retinopathy and optic neuropathy caused by a wasp sting.

Case Report

A 76-year-old man presented complaining of pain and visual disturbance OD after a wasp sting in the cornea 4 days previously. He had visited a private clinic with severe pain and eyelid edema, so intense that his eyelids would not open. At that time, he was treated with intravenous antihistamine and antibiotics. Visual acuity was hand motion and intraocular pressure was 37 mmHg. Slit-lamp biomicroscopy revealed severe conjunctival injection, chemosis, and a total epithelial defect with severe corneal edema and dense stromal infiltration (Fig. 1A, B). A penetrating track of a wasp barb was found at 9 o'clock in the mid-peripheral cornea (Fig.1A, arrow), but there were no leaks and no residual wasp barb. Anterior segment optical coherence tomography (Carl Zeiss Meditec, Dublin, CA, USA) showed dense media haziness in the anterior chamber (Fig. 1C). Ocular structures behind the cornea were invisible owing to severe media opacity in the anterior chamber, so relative afferent pupillary defects were not observable. Ultrasonography (USG; Optikon 2000, Rome, Italy) showed serous retinal detachment (Fig. 1D), and electroretinography (Roland Consult, Wiesbaden, Germany) demonstrated a flat wave (Fig. 1E). Flash vision evoked potential (fVEP, Roland Consult) showed a markedly decreased amplitude, but P100 was not delayed (Fig. 1F), and Goldmann perimetry (Takagi, Nagano, Japan) detected no surviving visual field. However, systemic blood profiles, a complete blood cell count, and a differential leukocyte count were within normal range, and C-reactive protein was 0.01 mg/dl. The patient was diagnosed with a corneal wasp sting accompanied by retinopathy and optic neuropathy.

The patient received topical 3.1% vancomycin/5% ceftazidime every 2 h, topical 1% prednisolone acetate (Pred Forte) every hour, and oral prednisolone 60 mg qam, topical 0.5% WP-934 (Rysmon TG) qam, and 0.5% apraclonidine (Iopidine) bid. Irrigation of the anterior chamber and





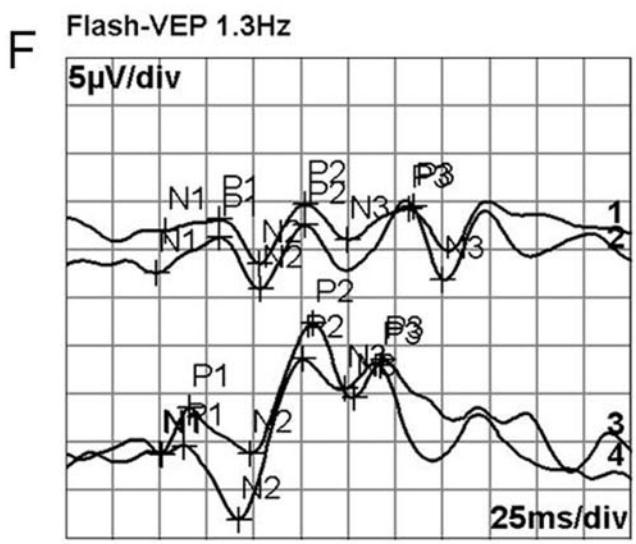


Figure 1. **A** Clinical photograph at initial presentation showing severe conjunctival injection, chemosis, total epithelial defect with severe corneal edema, and dense stromal infiltration. Note the penetrating site of the wasp barb at 9 o'clock at the mid-periphery of the cornea (*arrow*). **B** Clinical photograph at initial presentation (fluorescein stain) showing the total epithelial defect of the cornea. **C** Horizontal anterior segment optical coherence tomography scan image at initial presentation showing dense media haziness in the anterior chamber and anterior bowing of the iris. **D** Vertical ultrasonography scan image showing suspicious serous retinal detachment. **E** Electroretinogram showing a flat wave OD. *1*, OD; *2*, OS. **F** Flash vision evoked potential (*VEP*) showing a markedly decreased amplitude without P100 delay OD. *1, 2,* OD; *3, 4*, OS.

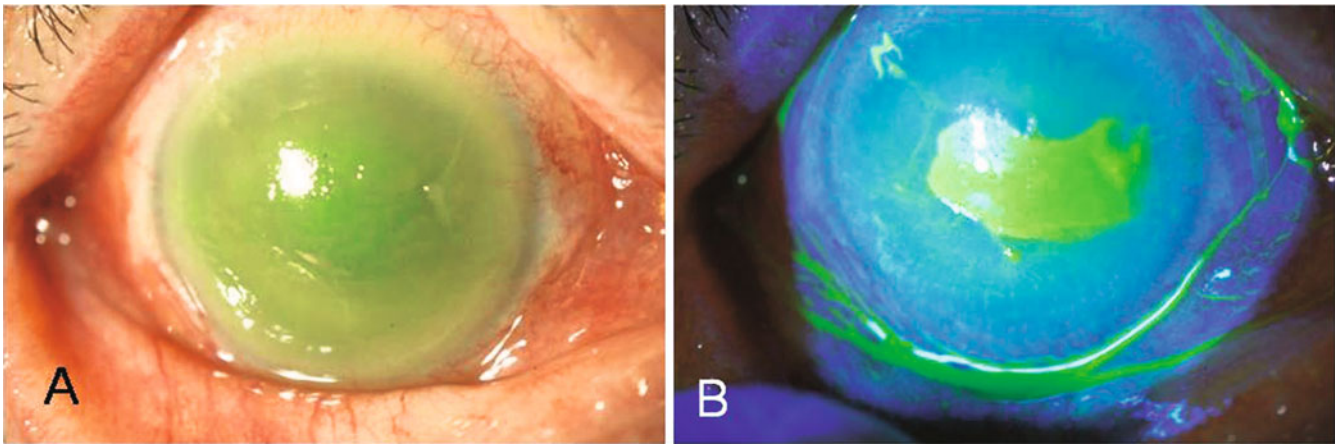


Figure 2. A Clinical photograph at 3 weeks after the corneal wasp sting showing improvement of the conjunctival injection, chemosis, and infiltration of the cornea. The iris, pupil, and cataract can be seen. **B** Clinical photograph at 3 weeks after the corneal wasp sting (fluorescein stain) showing a persistent small epithelial defect in the center and corneal edema.

transient amniotic membrane transplantation (AMT) were performed. Corneal scraping culture identified *Micrococcus* sp. The patient had no pain by 3 weeks, but lost his vision permanently. Slit-lamp biomicroscopy showed a persistent corneal epithelial defect with edema (Fig. 2). The iris looked atrophic and the pupil was partly dilated and fixed, but whether the cause was an afferent or efferent defect could not be ascertained. Other imaging and electrophysiologic examination showed the same findings as the previous examinations, suggesting persistent optic neuropathy and retinopathy. Phthisis developed after 3 months.

Comment

Corneal bee or wasp stings can cause various ocular abnormalities from toxic and immunologic responses to complex venom compounds.[1] In previous cases, localized opacity and bullous keratopathy have been reported.[1,2]

Surprisingly, we encountered a very severe case of a wasp sting that caused not only corneal decompensation but also optic neuropathy and retinopathy, resulting in phthisis. No leukocytosis or eosinophilia was observed to suggest significant systemic involvement of either inflammation or an allergic reaction. The clear vitreous on USG suggest that the effect of venom on the retina might be indirect. One possibility is that the anterior and posterior ciliary arteries collapsed owing to the severe inflammation, resulting in ischemia. It is also plausible that blockage of cholinergic synapses led to cell necrosis and intravascular coagulation with microangiopathy leading to neurotoxic effects, as previously reported.[3,4] Regarding optic neuritis, given that decreased amplitude without prolonged P100 latency on fVEP, obstructive vasculopathy-related optic neuropathy can be assumed rather than demyelination as previously reported.[5] However, it was not possible to determine the exact pathogenesis or whether a toxic or hyperallergic reaction elicited the vasculopathy. In addition, surgical intervention, such as anterior chamber irrigation and AMT might not be helpful in severe corneal wasp sting case with posterior involvement like our case.

In conclusion, we reported a corneal wasp sting associated with severe retinopathy and optic neuropathy, resulting in permanent visual loss and phthisis.

Keywords: endothelial decompensation, optic neuropathy, retinopathy, wasp sting

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