



Case report

Corneal wasp sting: A case report and review of literature

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Abstract

Purpose: To report severe immunologic and toxic reaction due to corneal wasp sting that may cause catastrophic sight-threatening outcomes.

Methods: A 45-year-old man referred to the emergency room with corneal wasp sting of *Vespa Orientalis*. The authors review previous Medline literature about this topic.

Results: In our case, the response to frequent topical corticosteroid was dramatic, and at the seventh day after injury, all inflammatory responses in the anterior segment of the eye had been resolved.

Conclusion: Corneal wasp injury with *Vespa Orientalis* can cause severe inflammation of the cornea and the anterior segment. Topical corticosteroids are the mainstay of treatment.

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Keywords: Wasp; Sting; Cornea

Introduction

Wasp sting penetration in the cornea is a rare, visual-threatening condition.¹ It causes a severe immunologic and toxic reaction typically due to the venom rather than the sting.² Therefore, corneal injury from different species of wasps may present with distinct corneal manifestations. There have been several case reports of corneal wasp stings in this regard so far. Herein, we present a case of wasp (*Vespa Orientalis*) corneal penetration with fulminant anterior segment inflammation and corneal ulcer formation presenting a few hours after exposure to the sting. To the best of our knowledge, this is the first report of wasp sting with the species *Vespa Orientalis*.

Case report

A 45-year-old man referred to the emergency room of ophthalmology department with chief complaint of severe ocular pain, decreased visual acuity, and periorbital edema and hotness. The patient reported that he was stung by a wasp on his left eye while he was driving a motorcycle a few hours earlier. Patient brought the dead wasp, and the species was confirmed by an entomologist as *Vespa Orientalis*.

In clinical examination, visual acuity of the left eye decreased to hand motion. Relative afferent pupillary defect was negative. External eye examination showed severe upper and lower lid edema and ptosis. There was no limitation in extraocular muscle motility. Slit-lamp examination revealed severe watery chemosis and a gelatinous stromal melting and infiltration of paracentral region of cornea (sizing 2 × 2 mm) with a brownish foreign body located in the center of melting in favor of wasp sting according to history. There was also a diffuse and severe corneal edema with Descemet membrane folds (Fig. 1). The Seidel test was negative with no sign of full

Conflict of interest: There is no conflict of interest for the all authors.

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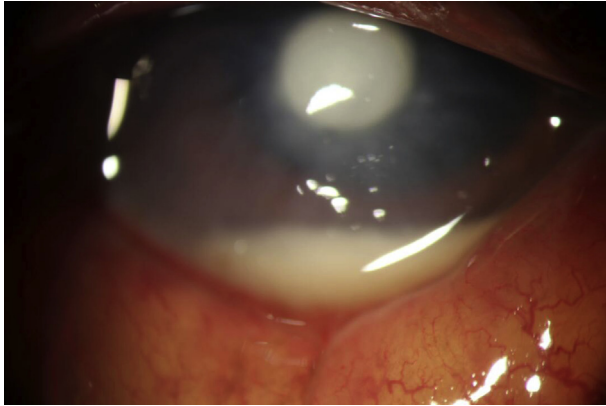
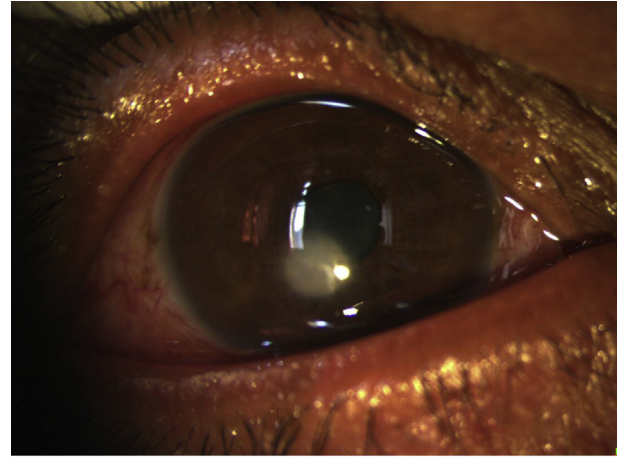


Fig. 1. Broad beam slit-lamp photograph of right eye shows severe chemosis, paracentral gelatinous stromal melting and infiltration 2 mm hypopyon is noted in anterior chamber.



HAAG-STREIT DIAGNOSTICS

Fig. 2. Paracentral corneal stromal scar after 2 months.

thickness corneal penetration. Anterior chamber examination showed normal depth, severe flare, severe cellular infiltration, and a 2 mm hypopyon. There was no sign of cataract or iris atrophy. Fundus examination was not possible due to severe corneal edema and anterior chamber cellular reaction. B-scan sonography was performed to evaluate posterior segment involvement which was unremarkable. Patient was admitted in the ophthalmology ward. Wasp sting was completely removed using a 27 gauge needle. No corneal suture was required after sting removal. Specimens from corneal scrapings were

obtained for culture and staining. Broad spectrum topical antibiotics (fortified ceftazidime and vancomycin eye drops) applied with loading dose every 5 min for 30 min and then continued each 1 h. We also prescribed topical cycloplegic every 8 h. After 2 days, patient response to fortified antibiotics was not dramatic, and culture was reported to be negative for bacteria and fungi. Then we tapered fortified antibiotics to every 4 h, and started topical prednisolone acetate 1% for every 2 h and systemic prednisolone for 1 mg/kg/day.

Table 1
Data of previous case reports of corneal sting since 1999–2016.

| Author | Gender (Age) | OD/OS | Treatment | First visual acuity | Final visual acuity | Sting |
|-----------------------------|--------------|-------|---|--------------------------|---------------------|------------------------|
| Höllhumer ¹ | F (5) | OS | Topical antibiotics Topical steroid | 6/18 | 6/9 | Bee (removed) |
| Al-Towerki ² | M (27) | OS | Fortified gentamycin Fortified cefazolin Voltarin eye drop | 2/200 | 20/60 | Bee (removed) |
| Lin ⁴ | M (18) | OD | Topical antibiotics (ofloxacin 0.3%) Cycloplegic (cyclopentolate) Systemic antibiotics (ceftriaxone) Systemic steroids (deflazacort) Sub-conjunctival steroid injections (dexamethasone) Topical steroid (dexamethasone) | 20/50 | 20/20 | Bee (removed) |
| Chinwattanakul ⁵ | F (46) | OS | Topical antibiotic (tobramycin ointment) | Finger counting | 20/20 | Bee (removed) |
| | M (3) | OD | Topical antibiotics (ciprofloxacin) Topical steroids (prednisolone acetate) | Unable to fix and follow | Fix and follow | Bee (removed) |
| Kim ⁷ | F (34) | OD | Topical besifloxacin 0.6% Topical prednisolone acetate 1% Intravenous moxifloxacin 400 mg/day Oral methylprednisolone 60 mg/day | 20/30 | 20/20 | Bee (removed) |
| Gürlü ⁸ | M (25) | OD | Fortified cefazolin Fortified gentamicin Prednisolone acetate 1% eye drop | Finger counting | 20/20 | Bee (removed) |
| Vélez ⁹ | M (60) | OS | Topical antibiotics and corticosteroids Triple procedure (PK, cataract extraction, IOL implantation) | Finger counting | 20/100 | No retained Bee sting |
| Sood ¹⁰ | F (50) | OD | Antibiotic steroid combined eye drop (predmox 1%) Oral histaminic (levocetirizine) | 6/18 | 6/6 | No retained Wasp sting |

F: Female; M: Male; OD: Oculus Dexter; OS: Oculus sinister; PK: Penetrating keratoplasty; IOL: Intraocular lens.

Response to systemic and topical corticosteroids was dramatic, and hypopyon was resolved at the third day (one day after prescription of prednisolone acetate 1%). At the seventh day, all signs were resolved except 1×1 mm corneal infiltration with sharp border and the central 1×0.5 mm epithelial defect. Then the patient was discharged from the ward, and the treatment continued with maintenance topical ciprofloxacin and tapering dose of prednisolone acetate 1% for the next 21 days. After 2 months, slit-lamp examination showed a paracentral corneal stromal scar (1×0.5 mm), and the patient regained visual acuity of 20/50 (Fig. 2).

Discussion

Wasp venom contains a mixture of compounds including non-enzymatic polypeptides (neurotoxins and cytolytic peptides) and enzymes (phospholipase A, phospholipase B, and hyaluronidase).¹ *Vespa Orientalis* is a kind of wasp that may cause anaphylactic reactions.³ As denoted previously, our case responded rapidly to topical corticosteroids, which implies immunological reaction to the venom rather than an infectious process. Accordingly, a recent study has identified *Vespa Orientalis* venom as an antibacterial agent against some gram positive and gram negative bacteria, which further decrease the possibility of superimposed infection.³ Bacterial infections have been noted in only 14% of corneal foreign body cases.⁴ The superimposed infection is even rarer in corneal wasp sting injury; and only a few cases of bacterial infection have been revealed by corneal scraping smear in previous reports (e.g., *Acinetobacter Iwoffii* and *Pseudomonas* spp.).⁵ In most of the previous case reports, the proper management of corneal bee/wasp sting injury consists of sting removal (which is controversial, but most studies support its necessity), topical corticosteroids, topical antibiotics, and topical cycloplegic^{4–6} (Table 1). Gürlü et al. prescribed systemic antibiotic (ceftriaxone 1 g/d for 5 days) and systemic steroids (deflazacort 60 mg/d for 2 weeks, 30 mg/d for the next week, and 15 mg/d for the last week) beside topical medications.⁴ Kim et al. reported that high dose systemic corticosteroids could improve

visual acuity as soon as 5 days after injury compared to the period 2 weeks to 3 months reported in other studies. In addition, systemic steroids might alleviate further the sequel of severe intraocular inflammation such as cataract and glaucoma.⁷ The improvement of visual acuity and corneal infiltration in our case occurred at about 1 month after injury. However, the outcome of our case could not be compared with other studies due to differences in species of insect, depth and size of sting, and the baseline visual acuity of patients prior to sting.

In conclusion, corneal wasp injury with *Vespa Orientalis* can cause severe inflammation of the cornea and the anterior segment, which has the potential to permanently affect vision. Topical corticosteroids are the mainstay of the treatment. The role of systemic steroids in decreasing complications of corneal wasp injury warrant further investigation.

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