

Peripheral ulcerative keratitis: An extremely rare case presentation after *Paederus* (beetle) injury

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Insect injury of the eye can elicit various toxic and immunological reactions in the eye and ocular adnexa. The retained body fluids, stingers or bite, and shells (exoskeleton) of the insects are the main source of the poisonous effects. Keratitis after insect injury is a sight threatening entity with deleterious effects.

Case Report

A 53-year-old male presented to our outpatient services with left eye (LE) redness, pain, and swelling since 3 days. He gave a history of accidental contact with some insect while farming. Best corrected visual acuity (BCVA) was 6/12 in both eyes at presentation. Examination of the right eye (RE) revealed immature cataract with rest of the anterior segment being normal. Examination of the LE revealed lid edema with marked conjunctival congestion and peripheral keratitis extending 2 clock hours from 3'0 clock to 5'0 clock, sparing the pupillary area. There was a foreign body (FB) lodged in the marginal cornea at 4'0 clock location (presumably an insect shell). The FB [Fig. 1] was removed with a 26-G needle under topical anesthesia. Following removal, slit beam examination of LE revealed crescent-shaped peripheral corneal melt with steep edges and exposed bare Descemet's membrane, surrounded by diffuse keratitis [Fig. 2a and b].

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LE corneal scraping for staining and culture was negative with no evidence of any infectious etiology. Patient was started on hourly topical moxifloxacin hydrochloride 0.5% and tobramycin empirically. The FB was sent to the entomologist of our local veterinary hospital to determine the probable insect. Entomological studies confirmed it to be the exoskeleton of *Paederus* spp. belonging to the order *Coleoptera*. On follow-up visit after 2 days, LE vision deteriorated to HM+ with increased pain and redness. On examination, there was total corneal abscess [Fig. 3], with marked conjunctival congestion. The patient was counseled for urgent need of therapeutic penetrating keratoplasty, and was followed up by surgery the next day. The trephined host corneal button was sent for microbiological examination and was again negative for any infectious etiology. Postoperatively, the patient was started on topical steroids 0.1% prednisolone acetate eye drops hourly and topical moxifloxacin four times per day. The patient recovered well with a BCVA of 6/60 in LE at 2 weeks postoperatively [Fig. 4]. At 6 weeks, patient's (LE) BCVA was 6/60 with immature cataract, and he is on regular follow-up.

Discussion

Although case reports of injury by members of the order *Hymenoptera* (e.g., bees, wasps, and biting ants)^[1] have been reported in the past, there is hardly any case report of injury by *Paederus* (beetle) involving the cornea.^[2] Unlike insects of the order *Hymenoptera*, the female beetle causes keratitis by releasing hemolymph, which contains a vesicant agent, paederin (C₂₄ H₄₃ O₉N). Paederin acts by inhibiting protein and DNA synthesis with sparing of RNA synthesis, thus blocking mitosis at cell division.^[3]



Figure 1: Removed foreign body (exoskeleton) of *Paederus* (beetle)

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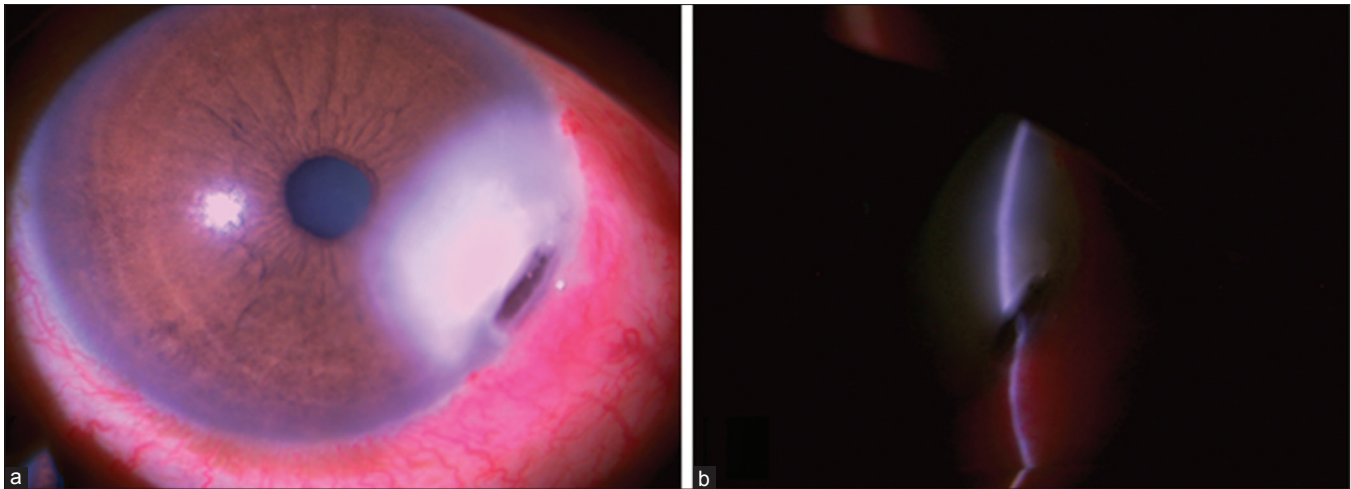


Figure 2: (a) Peripheral corneal melt at the site of the foreign body. (b) slit beam appearance

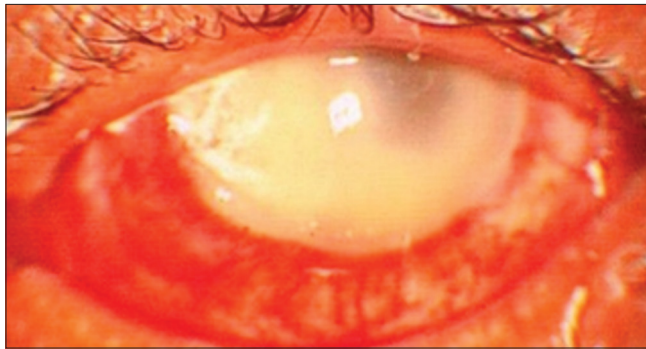


Figure 3: Corneal abscess

In our case, the mechanism of this peripheral melt could be either immunological due to release of toxic fluid or mechanical damage probably due to the lodged FB itself. Moreover, one probable cause for rapid melt and deterioration could be infection caused by *Pseudomonas aeruginosa*, as paederin-synthesizing female beetles harbor this bacterium with the closest relationship as an endosymbiont, although culture report was negative for any infectious etiology.^[4]

Conclusion

Prompt removal of any FB and aggressive management can prevent worst outcomes. Further, it needs to be emphasized that keratitis can worsen despite the removal of FB belonging to insects. Patients presenting with corneal infiltrates associated with the lodgment of such FBs must be informed of this possibility.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients



Figure 4: Two weeks post therapeutic penetrating keratoplasty

understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest

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