

Fungal keratitis associated with mite embedded in cornea

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Herein we describe the presence of tarsonemid mite in the eye of a patient with keratitis. This case illustrates the importance of scanning the slide under a fluorescent microscope using calcofluor white stain in addition to the routine laboratory protocol.

A 59-year-old male highway contractor presented with ocular discomfort, foreign body sensation, photophobia, redness, and occasional pain in the right eye for a week. On slit lamp examination of the eye, a foreign body with oval pigmented keratitis was detected at the 7.00 O'clock position, two mm from the limbus into the cornea [Figure 1a]. This foreign body was observed to be a dry, raised, brown-pigmented lesion with a deep surrounding zone of corneal infiltration. The eyelid showed no evidence of edema or blepharitis.

The corneal infected area was scraped for microscopic examination. A 10% potassium hydroxide (KOH) wet mount showed fungal filaments [Figure 1b]. After following our usual laboratory protocols, the slide was examined under a fluorescent microscope. A microscopic insect (200 μ m) with four pairs of legs and no apparent wings was observed entangled in the fungus [Figure 1c]. The fungal hyphae and the mite both appeared in the same field in the scraped material [Figure 1d] when observed once more under the light microscope. Entomologists further observed the slide and identified the mite as belonging

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to a sub-cohort of *Heterostigmae* (family Tarsonemid). This identification was made on the basis of the size of the insect and the morphology of its microscopic features like setae, genital structures, and spines.

After observing the corneal scraped culture on potato dextrose agar for 4 days, the fungus was identified as *Aspergillus fumigatus*. Visual acuity improved from 6/24 to 6/12 following a treatment regime that included antibiotics (moxifloxacin), application of antifungal eye drops every 2 h, application of atropine eye ointment twice a day, and daily administration of oral antifungal (150 mg fluconazole) for 3 weeks. Anti-mite treatment was not started as only one mite was found in the scraped material and fungal hyphae were predominantly found in the scraped material. When a foreign body is lodged on the cornea, there is an acute inflammatory response in the form of exudation of plasma and fibrin. This normally dislodges the foreign body. The composition of the foreign body determines the extent of the inflammatory response. For example, bee or wasp stings usually produce acute

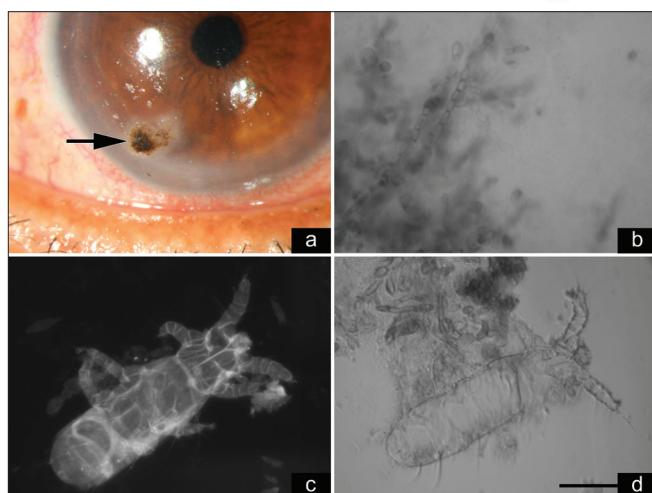


Figure 1: Clinical and microscopic photographs of the keratitis case. (a) Peripheral corneal ulcer and surrounding infiltration at the 7.00 O'clock position 2 mm away from the limbus. **(b)** A wet mount of scraped material in 10% KOH revealed hyaline, septate, branched fungal hyphae when examined under a light microscope (unstained, $\times 400$). **(c)** A wet mount of scraped material in 10% KOH revealed the presence of a mite when examined under a fluorescent microscope (unstained, $\times 400$). **(d)** The presence of fungal hyphae and mite both seen together in the scraped material (unstained, $\times 400$). The bar represents a scale of 50 μ m

reactions due to toxic agents contained in their venom. In the present case, the inflammatory response was insufficient and the mite got embedded in the eye. Mites are known to bite humans and cause irritation, itchy papules, and rashes. However, to the best of our knowledge, there are no reports on the immune response of the cornea to a tarsonemid mite. Hence it would be difficult to predict the outcome if a surgeon misses the presence of a mite in the eye.

The present case reports the presence of microscopically visible mite in the cornea along with infection by *A.fumigatus*. Previous reports of insect foreign bodies on the cornea were mostly based on clinical suspicion, patients' history, and memory. Corneal injuries have been reported to be associated with various insects and spiders.^[1] Mite is a term commonly used to refer to a group of insect-like organisms, some of which bite or cause irritation. Mites and/or mite eggs have been found in human urine, stool, and sputum but the clinical and medical significance of these studies have not been well established.^[2-4] Little is known about the medical and clinical significance of tarsonemid mites. Tarsonemid mites have been found in the sputum and have been associated with house dust allergy.^[4]

It has been reported that most species of the Tarsonemid family feed on the mycelia of fungal and algal bodies.^[5] This group of insects was shown to play a central role in the dispersal of fungal spores.^[6] Although we did not find any association between tarsonemid mites and *Aspergillus spp.* in the literature, the possibility of this mite being a vector of *A. fumigatus* cannot be excluded. Therefore, any one of the following options is a possibility: (1) the mite was the carrier of *Aspergillus*; (2) the mite entered the cornea along with dust particles containing *Aspergillus* spores; (3) *Aspergillus* spores entered the cornea after the mite had traumatized it.

Further we illustrate the importance of carrying out an examination under a fluorescent microscope using the calcofluor white stain. This stain has the advantage of being

highly sensitive in its ability to detect not only fungal hyphae and Acanthamoeba cysts but also chitin containing insects (mite in the present case).^[7] We recommend meticulous examination and laboratory investigation as mandatory procedures to rule out unusual causes like insect parts or fungi. Mite in the eye might be serious!

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