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Author

Zhao, Lisa

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CLINICAL VIGNETTE

A Case of Euphorbia Keratitis

Lisa Zhao, MD

A 24-year-old previously healthy male presented to the Emergency department with bilateral eye pain and redness. The patient is a gardener and was working with the plant *Euphorbia tirucalli*. He had been pulling out large amounts of the plant without gloves. He remembers rubbing his eyes with his bare hands and then feeling a gradual onset of eye pain and burning one hour prior to arrival. He attempted to flush his eyes out with a hose without improvement of his symptoms.

Upon arrival, the patient had normal vital signs. His visual acuity was 20/50 in the right eye and 20/70 in the left eye that did not correct with pinhole. He had bilateral conjunctival injection and tearing. There was no lid edema or chemosis. His pupils were equal, round, and reactive bilaterally and his extraocular movements were intact. On slit lamp exam, there were no foreign bodies and no cells or flare. Under fluorescein dye he was noted to have mild diffuse punctate uptake suggesting a superficial keratitis. Seidel's sign was negative.

Morgan's lens were placed on the patient and 3 liters of Normal Saline were flushed in the eye. The pH of eye was normal after normal saline infusion and the patient reported improvement of his pain, particularly after proparacaine hydrochloride ophthalmic administration. Ophthalmology was consulted and recommended artificial tears and erythromycin ointment nightly. The patient's repeat eye exam on follow up a week later with ophthalmology showed no fluorescein uptake and much improved symptoms.

Discussion

The Euphorbia genus contains over 2000 species throughout the world that can cause toxicity. The plants have a wide range of appearance from flowering to succulent or cactus-like and are commonly used as ornamental plants but often grow as weeds.¹⁻³ The milky white sap of many Euphorbiaceae are irritating to mucosal surfaces and can cause a dermatitis as well as systemic symptoms when ingested.^{1,3,4} Toxicity is thought to result from the diterpene ester, which has demonstrated anti-neoplastic activity rats.⁵ It is thought that this antineoplastic activity prevents corneal epithelial replication and therefore, healing.¹ Historically, Euphorbiaceae have been used to treat warts, pterygia, and carbuncles.⁶ It is still used in certain native populations in traditional medicines as an anti-helminthic and anti-tumor agent.⁵

There is very limited literature regarding the toxicity, mostly in the form of case studies or case series. Other species that have been implicated include *E. lathyris*,^{4,7} *E. lacteal*,² *E. royleana*,⁸ *E. grandicornis*,¹ *E. characias*,³ and *E. trigona*.³ In this case, the culprit plant is the *Euphorbia tirucalli*, also referred to as "sticks of fire" or "pencil cactus" and is a common decorative plant due to its vibrant orange color when in bloom.⁹ These species cause a spectrum of toxicity beginning with mild conjunctivitis to keratopathy with uveitis with case studies suggesting that some species are more toxic than others. Specifically, the presence of flavonoids, alkaloids, phenols, and sesquiterpene lactones can penetrate the entire cornea and may cause more toxicity in the anterior chamber. Corneal involvement also depends on the degree and length of exposure. The posterior segment is rarely involved.^{1,3} Symptoms usually begin immediately after contact with the offending plant, reaching its peak within one to two days.⁹ Patients may exhibit a reduction in vision and varying degrees of corneal sloughing as evidenced by fluorescein uptake. There can also be varying degrees of chemosis, lid edema, photophobia, and uveitis.^{2-5,7,10-11} Most cases have are self-limited and will clear within 1-3 weeks.² Three cases have resulted in hypopyon and from alkali chemical injury. If left untreated, exposure can lead to permanent blindness due to corneal ulceration and subsequent scarring.^{4,12}

Treatment of keratopathy is variable but often includes irrigation and topical antibiotics depending on the degree of damage. Irrigation should continue until pH normalizes. Cycloplegics may be used if photophobia is present and topical steroids are used if there is evidence of anterior chamber inflammation but are controversial given the risk of secondary infections.⁴ It is important that these patients receive follow up with ophthalmology to ensure that there is no permanent damage to the cornea.⁹ Patients should be warned that symptoms may worsen before improving. For preventative purposes, patients should be advised to use protective eyewear and gloves when dealing with this plant and to avoid hand to eye contact after handling the plant.⁴

This case study highlights the relatively unknown potential toxicity of a common plant. It is important as healthcare providers that we recognize and treat it in a timely manner to prevent further morbidity.



Euphorbia tirucalli

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