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Case Report

Exposure to Caper Spurge (*Euphorbia lathyris*) Sap: A Case of Ocular and Periorbital Toxicity

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Keywords
Keratoconjunctivitis · *Euphorbia* · Toxic keratitis · Toxic sap

Abstract
Introduction: We aimed to describe a case of bilateral keratoconjunctivitis after exposure to the toxic sap of *Euphorbia lathyris*. ***Case Report:*** A 76-year-old gentleman presented after exposure to *E. lathyris* whilst he was gardening. He had 6/12 visual acuity in his right eye, and 6/4 in his left. Examination revealed marked periocular dermatitis, conjunctival injection and corneal oedema in the right eye with diffuse punctate epithelial staining. He was treated with ocular irrigation, topical steroids, antibiotics, cycloplegics and lubricants. Over 48 h, his left eye started to become symptomatic. He developed bilateral corneal epithelial defects and anterior chamber inflammation. His visual acuity worsened to 6/36 right and 6/24 left. At his 3-week follow-up, there was marked improvement in the resolution of the toxic keratoconjunctivitis in both eyes. ***Conclusion:*** Toxic sap from *E. lathyris* can cause severe keratoconjunctivitis. Irrigation of both eyes despite unilateral symptoms and early follow-up should be considered signs of toxicity may only become evident after 24–48 h.

Introduction

E. lathyris (caper spurge) is a common garden plant and invasive weed native to Europe and Asia but prevalent all around the world. It belongs to the Euphorbiaceae family which includes over 2,000 species ranging from large succulents and trees to herbs. The latex sap

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from *Euphorbia* plants is known to be irritant to the skin and eyes. Ocular toxicity varies in severity with the species of plant. We report a case of bilateral severe keratoconjunctivitis secondary to exposure *E. lathyris*.

Case Report

A 76-year-old gentleman presented to the eye casualty department with symptoms of intense pain, redness and photophobia in his right eye which occurred shortly after pulling weeds in his garden about 6 h prior. He was working with one gloved hand, the other bare, and without protective eyewear. He proceeded to irrigate his eye with tap water at home before attending his local emergency department a couple of hours later. The plant he was handling was later identified as *E. lathyris*.

He had a history of bilateral cataract surgeries, and a previous vitrectomy in the right eye for a dropped lens. At his local emergency department, his right eye was irrigated with 2 L of saline. He was then referred to the eye casualty department where he received a further 1 L of irrigation. His post-irrigation pH was 7.0.

On examination, he had severe right eyelid swelling and tenderness consistent with periocular dermatitis. His presenting best corrected visual acuity was 6/12 OD and 6/4 OS. Intraocular pressures were 18 mm Hg OD and 13 mm Hg OS. A slit lamp examination revealed severe conjunctival hyperaemia with corneal oedema and diffuse punctate epithelial staining in the right eye. Both anterior chambers were deep and quiet. His macula and optic discs were healthy and OCT scans revealed bilateral epiretinal membranes. He was started on dexamethasone 0.1% preservative-free eye drops and chloramphenicol 1% ointment every four times a day, cyclopentolate 1.0% three times a day for 3 days and two-hourly lubricants to his right eye.

He was reviewed 2 days later. Unfortunately, his vision gradually worsened during this period and his left eye started to become symptomatic. His visual acuity dropped to 6/36 OD and 6/24 OS. In addition to periocular contact dermatitis, he developed bilateral epithelial defects measuring 3 × 5 mm in the right and 7 × 8 mm in the left (Fig. 1). Both cornea were oedematous with Descemet membrane folds. He also developed anterior chamber inflammation (2+ cells) bilaterally.

Dexamethasone 0.1% eye drops and chloramphenicol 1% ointment were commenced to the left eye in addition to the ongoing treatment in the right. Topical steroids were increased to two hourly in both eyes for 2 days, and then tapered to four times a day for 2 weeks, twice a day for 2 weeks and once a day for 2 weeks. Topical antibiotics were stopped after 2 weeks.

At 1-week follow-up, the corneal epithelial defects reduced in size (Fig. 2). At 3 weeks, he made a good recovery. Few punctate epithelial erosions remained in the right eye, but there were no other signs of toxic conjunctivitis, limbal ischaemia, or cicatricial changes (Fig. 3). The anterior chamber inflammation resolved, and his visual acuity improved to 6/7.5 in both eyes. The patient did not report any adverse effects with the drop regime.

Discussion

E. lathyris, also known as the caper spurge, is one of the 2,000 different species of the Euphorbiaceae or Spurge family. It is native to regions in Southern Europe and parts of northern Africa and Asia but is also prevalent in southern England as garden weeds or kept as ornamental house plants or rock garden plants.

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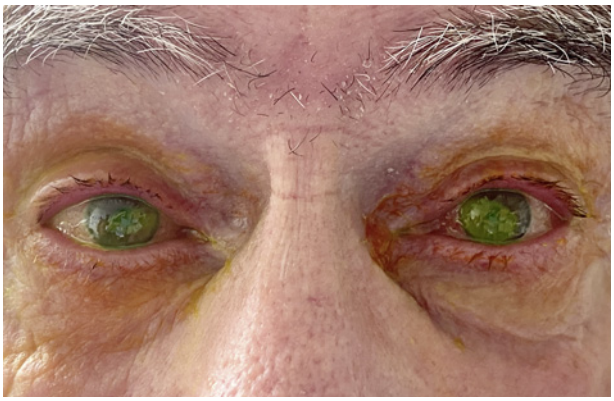

Fig. 1. Bilateral periocular contact dermatitis and corneal epithelial defects staining with fluorescein.

The seeds of *E. lathyris* have been used in traditional Chinese medicine for various ailments including amenorrhoea, constipation and snake bites among other uses [1]. The *Euphorbia* sap has also been used in India and Africa to treat warts and verrucas [2, 3]. Several studies have also demonstrated the plant's antioxidant, anti-inflammatory and antitumour effects against various cancers [4, 5].

The corrosive, white latex sap in many *Euphorbia* plants is toxic and is known to cause inflammation to the skin, eyes and mucous membranes. This toxicity has evolved over time as a protective deterrent against attacking herbivores. The irritant properties of the latex sap are due to the presence of polycyclic diterpene esters [6]. Many components of the *Euphorbia* sap including phenols, alkaloids and sesquiterpene lactones are lipophilic, allowing penetration of the corneal epithelium into the anterior chamber [7, 8].

Whilst skin exposure to the sap causes contact dermatitis, ocular inflammation of variable severity has been reported depending on the species of *Euphorbia*. There have been previous reports of mild conjunctivitis, keratouveitis, hypopyon, alkaline injury to blindness [9]. Joshi et al. [10] reported a case series of twelve army soldiers who developed mild superficial punctate keratopathy due to sap exposure from *Euphorbia tirucalli* during area cleaning without protective eyewear. On the other spectrum, exposure to *Euphorbia royleana* sap resulted in corneal perforation, blindness and eventual enucleation in a case report in 1972 [11].

In animal studies, ocular toxicity from *Euphorbia* sap resulted in keratoconjunctivitis, corneal oedema, and haemorrhages of the conjunctiva. Histologically, the peripheral cornea began to vascularise and infiltration of the anterior chamber with polymorphonuclear leucocytes occurred [12]. These findings typically resolved after 1–3 weeks, which correlates well with reported cases in humans.

To our knowledge, this is the second paper to report severe keratoconjunctivitis secondary to *E. lathyris* exposure. This is the first case to report sequential toxicity that developed over 48 h. In a small case series in 1994, Antcliff et al. [13] reported a patient with extensive bilateral corneal oedema, hypopyon and tenacious mucopurulent discharge after contact with *E. lathyris*. In another patient, exposure led to a large central ulcer of more than 50% of the cornea. Ioannidis et al. [14] reported a case in 2009 that resulted in an alkaline injury with an ocular pH of 9.

The patient in this case report was able to give a clear history of contact with *E. lathyris*. At presentation, only his right eye was symptomatic and irrigated at his local emergency department. His left eye started to develop signs of toxic keratoconjunctivitis after 24–48 h. This could suggest a difference in onset of toxicity between eyes or an early chemical injury that was not clearly evident in the left at presentation, which progressed to a large epithelial defect and inflammation.

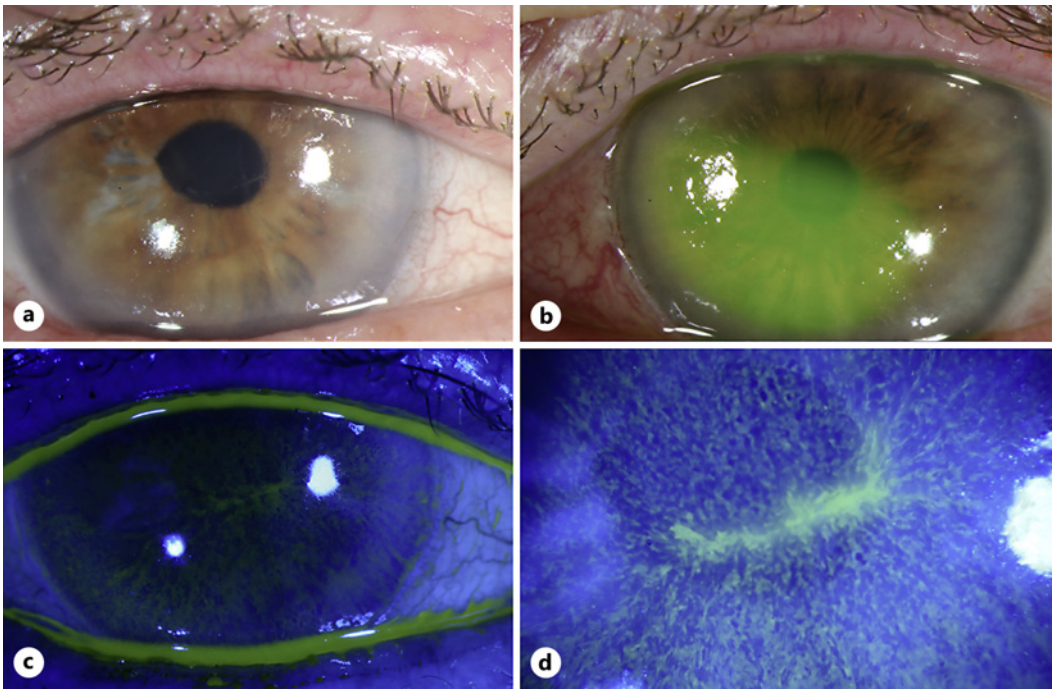

Fig. 2. Clinical photographs at 1-week follow-up. **a** OD healing epithelial defect. **b** OS epithelial defect with fluorescein staining. **c**, **d** OD healing epithelial defect under blue light illumination.

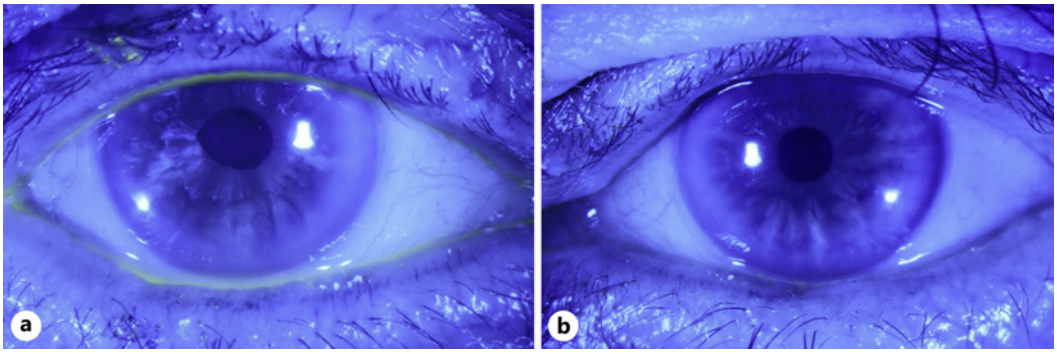

Fig. 3. Three week follow-up showing resolution of corneal epithelial defects and toxic conjunctivitis OD (**a**) and OS (**b**).

Therefore, we recommend that on suspicion of ocular contact with *E. lathyris*, copious saline irrigation of both eyes is key despite unilateral symptoms, with pH testing and irrigation until neutrality is reached. Broad-spectrum antibiotics should be started for prophylaxis as well as topical steroids to minimise inflammation. The plant or plant sap should be brought in for identification and patients should have early follow-up with clinical photos to track progress. Establishing a good temporal historical relationship from plant to eye is extremely important and in cases of toxic epitheliopathy or chemical injury with an unclear trigger, a history of recent gardening should always be obtained.

In conclusion, the toxic sap from *E. lathyris* can cause severe keratoconjunctivitis. Irrigation and early follow-up are key as signs of toxicity may only become evident after 24 h. Eye protection and gloves should be worn when gardening to prevent direct ocular contact or

indirect contact via contaminated hands. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000539419).

Statement of Ethics

Written informed consent was obtained from the patient for publication and the use of clinical images. Ethical approval is not required for this study in accordance with local or national guidelines.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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Author Contributions

L.T.K.: conceptualisation, writing – original draft, and writing – review and editing. N.D. and M.B.: conceptualisation, writing – reviewing and editing, validation and appraisal, and clinical management. F.C.: validation and appraisal.

Data Availability Statement

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

References

1 An Editorial Committee of the Administration Bureau of Traditional Chinese Medicine. Chinese Materia Medica (Zhonghua Benchao). Shanghai, China: Shanghai Science & Technology Press; 1998. Volume 4; p. 798–801.
2 Watt JM, Breyer-Brandwijk MG. The and poisonous plants of southern and eastern Africa. Edimburgh & London: E. & S. Livingstone Ltd; 1962.
3 Chopra RN, Nayar SL, Chopra IC. Glossary of Indian medicinal plants. New Delhi: National Institute of Science Communication and Information Resources CSIR; 2009.
4 Ernst M, Grace OM, Saslis-Lagoudakis CH, Nilsson N, Simonsen HT, Rønsted N. Global medicinal uses of Euphorbia L.(Euphorbiaceae). J Ethnopharmacol. 2015;176:90–101. https://doi.org/10.1016/j.jep.2015.10.025
5 Mesas C, Martínez R, Ortíz R, Galisteo M, López-Jurado M, Cabeza L, et al. Antitumor effect of the ethanolic extract from seeds of Euphorbia lathyris in colorectal cancer. Nutrients. 2021;13(2):566. https://doi.org/10.3390/nu13020566
6 Webster GL. Plant dermatitis. Irritant plants in the spurge family (Euphorbiaceae). Clin Dermatol. 1986;4(2):36–45. https://doi.org/10.1016/0738-081x(86)90062-3
7 Barile E, Corea G, Lanzotti V. Diterpenes from Euphorbia as potential leads for drug design. Nat Prod Commun. 2008;3(6):1934578X0800300. https://doi.org/10.1177/1934578x0800300629

8 Zhu A, Zhang T, Wang Q. The phytochemistry, pharmacokinetics, pharmacology and toxicity of Euphorbia semen. J Ethnopharmacol. 2018;227:41–55. https://doi.org/10.1016/j.jep.2018.08.024
9 Eke T, Al-Husainy S, Raynor MK. The spectrum of ocular inflammation caused by Euphorbia plant sap. Arch Ophthal. 2000;118(1):13–6. https://doi.org/10.1001/archopht.118.1.13
10 Joshi D, Shingal P. Ocular injuries from plant sap in army soldiers. Med J Armed Forces India. 2008;64(3):293–4. https://doi.org/10.1016/S0377-1237(08)80127-X
11 Sofat BK, Sood GC, Chandel RD, Mehrotra SK. Euphorbia royleana latex keratitis. Am J Ophthalmol. 1972;74(4):634–7. https://doi.org/10.1016/0002-9394(72)90825-2
12 Geidel K. Klinische Beobachtung und tierexperementelle Untersuchungen uber die Wirkung vom Saft der Euphorbia lathyris (Springwolfsmilch) am Auge.[Clinical observation and animal experimental studies on the effect of the sap of Euphorbia lathyris on the eye.]. Klin Monbl Augenheilkd Augenarztl Fortbild. 1962;141:374–9.
13 Antcliff RJ, Hodgkins PR, Bowman R, Keast-Butler J. Euphorbia lathyris latex keratoconjunctivitis. Eye. 1994;8(Pt 6)(6):696–8. https://doi.org/10.1038/eye.1994.173
14 Ioannidis AS, Papageorgiou KI, Andreou PS. Exposure to Euphorbia lathyris latex resulting in alkaline chemical injury: a case report. J Med Case Rep. 2009;3:115–3. https://doi.org/10.1186/1752-1947-3-115