The Spectrum of Ocular Inflammation Caused by Euphorbia Plant Sap

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Objective: To report the spectrum of clinical findings in patients with ocular inflammation caused by plant sap from Euphorbia species.

Design: Clinical case series.

Setting: Ophthalmology emergency referrals in the United Kingdom.

Patients: We examined 7 patients, all of whom gave a history of recent ocular exposure to the sap of Euphorbia species.

Interventions: All patients were treated with antibiotic drops or ointment (chloramphenicol). Cycloplegic and steroid drops were also used for some patients. Patients were observed until all signs and symptoms had resolved.

Main Outcome Measures: Symptoms, visual acuity, and clinical signs of inflammation. All patients provided a specimen of the plant for formal identification.

Results: Initial symptoms were generally burning or stinging pain with blurred vision. In most cases, visual acuity was reduced between 1 and 2 Snellen lines. In 1 patient with age-related maculopathy, acuity dropped from 20/80 to hand motions before recovering. Clinical findings varied from a mild epithelial keratoconjunctivitis to a severe keratitis with stromal edema, epithelial sloughing, and anterior uveitis. All signs and symptoms had resolved by 1 to 2 weeks.

Conclusions: These cases illustrate the range of severity of Euphorbia sap keratouveitis. The condition seems to be self-limiting when managed supportively. People who work with Euphorbia plant species should wear eye protection. Clinicians managing keratopathy caused by Euphorbia species should be aware of the danger of sight-threatening infection and uveitis, particularly during the first few days.


The Family Euphorbiaceae includes trees, succulents, and herbaceous plants. Species of Euphorbia grow in all 5 continents, either wild or as cultivated specimens in the house or garden. The latex or sap of many Euphorbia plants is toxic, and may cause inflammation of skin and the eye on contact. Ocular inflammation varies from a mild conjunctivitis to severe keratouveitis, and there have been several case reports of permanent blindness resulting from accidental exposure to the sap. If the cornea is involved, changes generally follow a typical sequence, with worsening edema and epithelial sloughing on the second day. While the literature regarding ocular damage from Euphorbia sap is relatively sparse, it is becoming apparent that some species are more toxic than others. When treated early and managed appropriately, cases generally resolve without sequelae.

We present 7 cases of ocular toxicity caused by Euphorbia sap, including the first recorded cases caused by the decorative garden plants E palustris, E characias, and E characias subsp wulfenii, and the “crown of thorns” houseplant E milii.

REPORT OF CASES

CASE 1

A 74-year-old woman with known age-related maculopathy was trimming her E milii houseplant (crown of thorns or crucifixion plant) when she accidentally touched her right eye with her gloved hand. Twenty minutes later, the eye became painful, with lacrimation and gradual blurring of vision. She was assessed in a general emergency unit 4 hours later. Visual acuity, which had been measured the previous month at 20/80 OD, was reduced to 20/200 OD. There was conjunctival hyper-
emia but no corneal uptake of fluorescein. The eye was irrigated and treated with chloramphenicol ointment and a firm pad. Sixteen hours after the injury, acuity had decreased to hand motions only. There was moderate lid edema and marked conjunctival injection. Slitlamp examination revealed loss of central corneal epithelium, stromal edema, and folds in the Descemet membrane. Intraocular pressure was 16 mm Hg OD, and no inflammatory signs were seen in the anterior chamber. She was treated with a drop of 1% homatropine, chloramphenicol ointment, and repadding for a further 24 hours. When he returned 2 days later, the pain was less marked, though visual acuity had decreased to 20/60 OD. The area of corneal staining had extended to include the inferior cornea, though there was no epithelial sloughing. No stromal edema was seen, and the anterior chamber remained quiet. Treatment with topical ointment was continued for 2 weeks, after which the eye had returned to normal.

CASE 2

A 73-year-old man was trimming his garden plant *E. characias* when sap sprayed into his right eye. The eye was immediately painful and was irrigated with water.

He was assessed by an ophthalmologist later the same morning. The eye was still painful and there was marked lacrimation. Visual acuity was 20/30 OD. The conjunctiva was hyperemic, and the interpalpebral corneal epithelium and nasal conjunctiva took up fluorescein. There was no edema of the corneal stroma, the anterior chamber was quiet, and intraocular pressure was normal. He was treated with chloramphenicol ointment 4 times daily. When he returned 2 days later, the pain was less marked, though visual acuity had decreased to 20/60 OD. The area of corneal staining had extended to include the inferior cornea, though there was no epithelial sloughing. No stromal edema was seen, and the anterior chamber remained quiet. Treatment with topical ointment was continued for 2 weeks, after which the eye had returned to normal.

CASE 3

A 66-year-old man was pruning *E. characias* subsp *wulfenii* in his garden when he felt a stinging sensation as sap hit his right eye. He did not irrigate the eye until 10 minutes later, by which time he was suffering increasing pain and blepharospasm.

Irrigation was repeated when he was seen by an ophthalmologist later the same day. Visual acuity was 20/40 OD and 20/20 OS. There was marked conjunctival hyperemia and the central cornea showed punctate staining with fluorescein. There was no stromal edema, the anterior chamber was quiet, and intraocular pressure was the same in each eye. He was treated with chloramphenicol drops 4 times daily. The following day, visual acuity was still 20/40 OD and corneal signs were improving. Lid swelling and erythema were noted. After 2 days of topical treatment visual acuity returned to its previous level of 20/20 OD, and by 1 week all the symptoms and signs had resolved.

CASE 4

A 43-year-old woman was pulling up an overgrown specimen of *E. palustris* (*Figure 2*, A) in her garden when she felt some sap spray into her left eye. The eye became painful, and was immediately irrigated with water.

Slitlamp examination 2 hours later revealed conjunctival hyperemia with small areas of punctate opacification of the corneal epithelium. There was no stromal edema, and the eye was otherwise quiet, with visual acuity of 20/20 OS. The eye was treated with a topical 2% homatropine drop and chloramphenicol eye ointment 4 times daily. The next day, the eye was more comfortable, and corneal signs were improving (*Figure 2*, B). All symptoms had resolved by 4 days.
CASE 5

A 60-year-old woman used some cut stems of *E. marginata* as part of a flower arrangement. She was aware of the toxic nature of *Euphorbia* sap, and took care to protect her skin while trimming the stems. As she threw the stems into the bin, she felt something hit her left eye. “Burning” pain followed within seconds, and the eye was immediately irrigated with water. The eye became red and photophobic with blurred vision.

She was examined 2 hours after injury. Unaided visual acuity was 20/30 −1 OS and 20/30 +2 OD. The left eye was hyperemic, with a small (2-mm) area of corneal epithelial loss. The anterior chamber was quiet, and intraocular pressures were 18 mm Hg OU. She was treated with topical chloramphenicol ointment 4 times daily and 1% cyclopentolate drops twice daily. Two days later, symptoms were much improved and the corneal epithelium was healing. Intraocular pressures were 17 mm Hg OS and 16 mm Hg OD. There was a mild anterior chamber reaction with cells (+/−) and flare (+/−) and no inflammatory signs in the posterior segment. Treatment continued, and after 1 week all symptoms and signs resolved.

CASE 6

A 68-year-old woman was cutting a *E. platyphyllos* plant in the garden. She remembered rubbing her eyes at the time, but did not develop symptoms until some hours later. She was assessed the following day, with complaints of blurred vision and itching. Visual acuities were 20/30 OD and 20/40 OS. Her lids were erythematous and slightly swollen, and there was bilateral chemosis. The corneas showed mild epithelial edema, but intraocular pressures were normal and the anterior chambers were quiet. She was treated with chloramphenicol ointment 4 times daily. The next day, symptoms were settling and all signs and symptoms had resolved by day 5.

CASE 7

A 77-year-old woman with previous bilateral macular hemorrhages was pruning an *E. robbiae* plant in her garden when she felt some white sap enter the left eye. The eye became painful and was irrigated with water.

She was assessed in a general emergency unit 3 hours later. The left conjunctiva was hyperemic and there was punctate uptake of fluorescein. Visual acuity was counting fingers OU. Chloramphenicol ointment was instilled. Twelve hours later, slitlamp examination revealed punctate corneal epithelial loss, a slight reduction in intraocular pressure (12 mm Hg OS, 14 mm Hg OD), and a quiet anterior chamber. Treatment continued with chloramphenicol ointment 4 times daily and 1% cyclopentolate drops twice daily. Two days later, all signs and symptoms had resolved.

COMMENT

There is a spectrum of ocular inflammation associated with *Euphorbia* sap exposure. Neglected cases can progress to blindness, and the literature includes reports of corneal scarring, iris synechiae, and anterior staphyloma.2-4 It seems that most or all of these cases involved secondary bacterial infection. Recently, the self-limiting nature of appropriately managed cases has been emphasized.5 While there are still relatively few case reports in the literature, it is becoming apparent that there is a typical syndrome of “*Euphorbia* keratopathy,”5 and that the severity of the ocular inflammation may be related to the species of plant.

After exposure to *Euphorbia* sap, ocular changes usually follow a typical course.2,5 Symptoms generally begin immediately on contact with the sap. There is burning pain, photophobia, and lacrimation, which may worsen over hours or days despite irrigation. Visual acuity is at first mildly reduced, but may deteriorate to 20/200 or worse the following day. On initial examination, the corneal epithelium may be edematous and/or show focal areas of epithelial loss. The stroma may also be edematous, with folds in the Descemet membrane. The degree of associated conjunctivitis and anterior uveitis is variable and is particularly marked with certain species.2 The central corneal epithelium may slough off on the second day and may take more than a week to heal. With appropriate supportive therapy and close observation, the condition generally resolves completely within 1 to 2 weeks.

In published cases, the degree of ocular inflammation seems to be related to the species of *Euphorbia* plant sap, and also to the amount of sap that enters the eye. Petty spurge (*E. peplus*) sap causes a typical *Euphorbia* keratopathy with a fibrinous anterior
uveitis.7-9 Caper spurge (E lathyris) sap gives a similar clinical picture, though the uveitis appears to be less marked and there is no fibrin.6,10,11 The pencil tree (E tirucalli)5,12,13 and candelabra cactus (E lactea)5,13 also cause keratopathy, with a variable degree of uveitis. Our cases 3 and 4 suggest that E characias and its subspecies wulfenii cause only mild keratopathy without uveitis.

CONCLUSIONS

Although Euphorbia keratopathy and uveitis seem to be self-limiting when managed supportively, it is important to remember that blindness can occur, particularly in neglected cases. People who work with Euphorbia species should wear eye protection. Clinicians managing Euphorbia keratopathy should be aware of the danger of sight-threatening infection and uveitis, particularly during the first few days. Our suggestions for management of acute Euphorbia sap keratouveitis appear in the Table.

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We are grateful to Richard J. Gornall, PhD, Director of Leicester University Botanic Garden, Leicester, United Kingdom, for identification of the plant specimens.

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REFERENCES


Suggested Management of Acute Euphorbia Sap Keratouveitis

- Irrigate, take history.
- Full ocular assessment: acuity, lids, conjunctiva, cornea, intraocular pressure, anterior chamber and vitreous inflammation.
- Look for secondary infection.
- Treat with topical cycloplegics and antibiotic; consider pads and anti-inflammatory drops.
- Warn patient that vision may get worse before it improves.
- Follow up closely for the first few days (danger of infective or inflammatory problems, corneal slough).
- Ask patient to bring in a sample of the plant for identification (best to include flowering/fruited parts).

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