

Case Report

CALOTROPIS PROCERA LATEX INDUCED OCULAR TOXICITY

Puspadevi Armugham^{1,2}, Wan Radziah Wan N¹ & Wan Haslina Wan Abdul Halim²

¹Department of Ophthalmology, Hospital Selayang, Lebuhraya Selayang-Kepong, 68100 Batu Caves, Selangor Darul Ehsan, Malaysia.

²Department of Ophthalmology, Faculty of Medicine, University Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Kuala Lumpur, Malaysia.

ARTICLE INFO

Corresponding author:
Dr. Puspadevi Armugham

Email address:
puspadevi@yahoo.com

Received:
January 2022
Accepted for publication:
March 2022

Keywords:

calotropis procera;
corneal oedema;
corneal epithelial defect

ABSTRACT

Calotropis procera belonging to Asclepiadaceae family and it is also known as Sodom apple, Akra tree or Madar shrub. Accidental exposure of thick latex from *Calotropis procera* can cause severe ocular toxicity. A 70-year-old Indian man presented with right painful blurring of vision associated with redness of one day duration. The symptoms started after the eye was splashed with latex from Akra tree (*Calotropis procera*). On ocular examination, his right eye visual acuity was counting finger. There was diffuse cornea oedema, descemet's folds and presence of epithelial defect inferiorly and continuous with conjunctival epithelial defect inferiorly up to the inferior fornix. There was generalized conjunctival injection. The right eye examination was unremarkable. Patient was treated with topical antibiotics and topical corticosteroids. The patient responded well to topical treatment. Complete resolution of the ocular signs and symptoms was seen after one week.

INTRODUCTION

The *Calotropis Procera* belongs to the Asclepiadaceae family, which grows in a wide variety of climates and soil, including sandy, alkaline, and dry soil in many parts of the world. A medium-branched, perennial shrub that grows up to 4-5 meters tall with milky latex throughout its branches. The flowers or garland of this plant are offered to Lord Siva as a form of worship. In rare cases, people have suffered ocular injuries as a result of accidental inoculation or contact with the latex of *Calotropis Procera* while plucking the flower or leaf stalk [1,2].

As a result of both the acidity and the potency of toxins in the latex, ocular manifestations may occur. Accidentally exposure is through inadvertent contact with the flowers or splashing of latex into the eyes while handling the plant.

We report a case of ocular toxicity after accidental exposure of the latex of *Calotropis Procera*, its effect on the corneal endothelium and the management.

CASE REPORT

A 70-year-old Indian man with underlying Diabetes Mellitus, Hypertension, and ischemic heart disease presented with right painful blurring of vision

associated with redness for one-day duration. The symptoms started after the eye was splashed with latex from the Akra tree (*Calotropis Procera*) (Figure 1). The incident occurred when the patient plucked a flower from the tree to be used during prayer. On ocular examination, his right vision was only counting fingers.

Upon presentation to the eye clinic, his ocular surface pH was 8.0. Copious irrigation was initiated until the pH was reduced to 7.0. There was diffuse corneal edema with Descemet folds and epithelial defect inferiorly measured 3.2 mm x 2.6 mm until the limbus (Figure 2), continuous with conjunctival epithelial defect up to the inferior fornix (Figure 3). There was generalized conjunctival injection. The intraocular pressure was 14mmHg. The anterior chamber was otherwise quiet and deep. The lens was mildly cataractous, more of nuclear sclerosis. The fundus was normal. The left eye examination was unremarkable.

He was prophylactically treated with gutt Chloramphenicol every four hours, Chloramphenicol ointment TDS. In view of cornea oedema he was also prescribed with gutt Hypertonic Saline 3% QID. After 24 hours the epithelial defect resolved and his visual acuity improved to 6/60. Gutt Dexamethasone

0.1% QID was added. At one week review visual acuity improved to 6/12 and there were complete resolution of the ocular signs (Figure 4).

DISCUSSION

Calotropis Procera is a plant mentioned in Ayurveda as a plant with important medicinal properties. It contains many biologically active chemicals such as cardenolides, tannins, steroids, glycosides, terpenoids, sugars, phenols, flavonoids, saponins, and glycosides. It has many pharmacological

effects such as antimicrobial, anthelmintic, anti-inflammatory, analgesic and antipyretic, anti-cancer, anti-angiogenic, immunological, antidiabetic, cardiovascular, hypolipidemic, gastroprotective, hepatic protective, renal protective, antidiarrheal, antioxidant, anticonvulsant, enhancement of wound healing, antifertility and smooth muscle relaxant effect [1]. There are also several alkaloids in Calotropis Procera latex, including Catotoxin, Caltropin, Calcilin, and Gigantin, which are toxic [1,2,3]. A number of studies have reported that accidental contact with Calotropis latex caused keratoconjunctivitis and



Figure 1: Plant of Calotropis procera

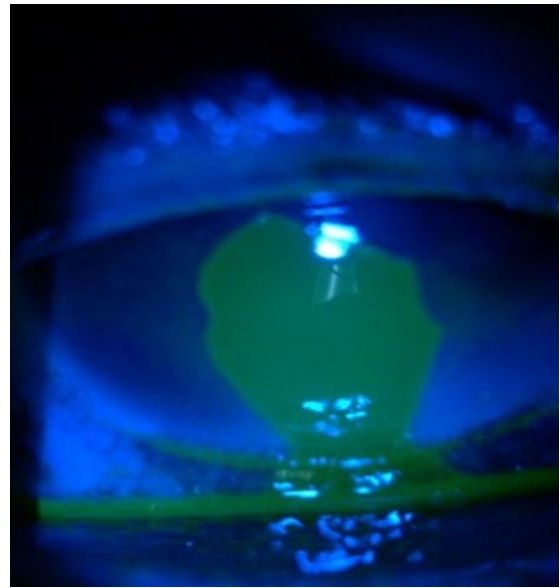


Figure 2: Right corneal epithelial defect, stained with fluorescein

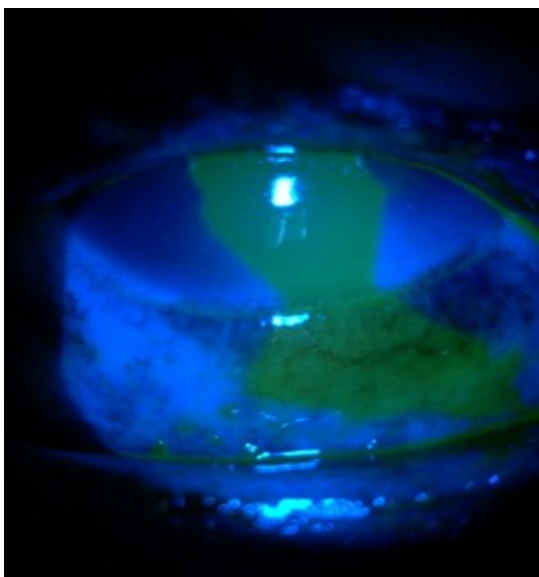


Figure 3: Right corneal and inferior conjunctival staining

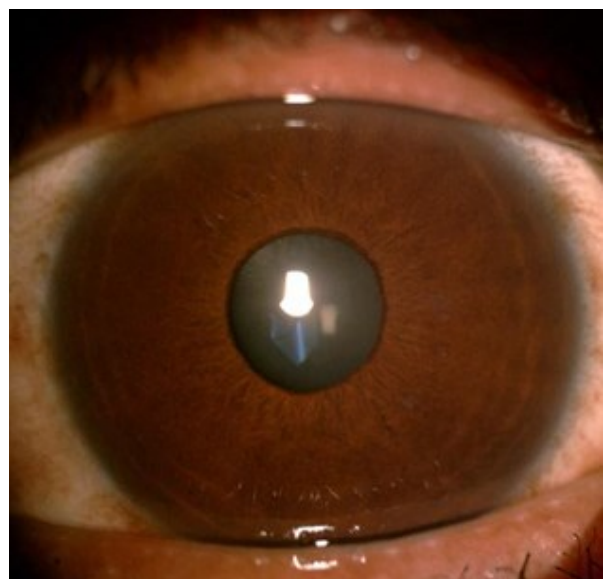


Figure 4: Anterior segment photography at one week showing resolved corneal oedema and epithelial defect.

corneal edema with vision loss (4,5,6).

Similar to our case, accidental contact of *Calotropis* latex mostly occurs while plucking flowers or leaves. Severe corneal edema with significant reduction of vision after inoculation of latex was reported in several studies [7,8,9]. In the acute stage, the patient will present with burning sensation, pain, photophobia, and staining of cornea and conjunctiva due to epithelial defects [10,11]. Painless presentation of the patient despite severe injury can be due to the analgesic property of the sap, or its inherent anesthetic property. It has been demonstrated that after injury, latex can penetrate intact corneas and permanently damage the endothelium, as shown by a decrease in the number of corneal endothelial cells and significant morphologic changes to the endothelial cells [9,12,13].

Specular microscopy can be used to monitor endothelial cell count. In specular microscopy, there will be low endothelial cell count with pleomorphism and polymegathism in the affected eye. According to Al-Mezaine et al., in their case there was permanent endothelial cell loss as well as morphological defects [5]. Based on specular microscopy, Basak et al found that 17 out of 23 eyes had less endothelial cell count (74%) than the normal eye. These findings also suggest that the cause of corneal edema is endothelial toxicity [9].

In our case, there is inferior conjunctival staining in the pattern of a triangle with the apex towards the inferior limbus and base towards the fornix. This finding is also reported by Col Shrikant Waiker et al [10]. The epithelial defect can occur when a latex falls into the eye it tracks down and settles down in the inferior fornix causing injury along its path. Clinically our patient showed full recovery of corneal edema, epithelial defect, and visual acuity within 1 week of treatment. It is most likely due to early copious eye irrigation followed by the topical medication including topical corticosteroid. The immediate eye irrigation reduced the amount of toxins and its contact with the eye.

There is no iridocyclitis and secondary glaucoma noted in our case. Tomar et al and Basak et al reported that there was toxic iridocyclitis due to *Calotropis* [8,9]. It can occur when the quantity of latex entering the eye is significant and/or when it was not immediately washed off, allowing the toxins to penetrate the cornea into the anterior chamber. The latex of *Calotropis Procera* has been found to contain histamine and prostaglandins which may lead to iridocyclitis [9]. The raised intraocular pressure could be secondary to iridocyclitis which was reported by Basak et al in their series [8].

CONCLUSION

Early recognition and timely intervention of ocular toxicity secondary to *Calotropis procera* latex is

essential to prevent sight threatening complications. Health education is crucial to preventing serious injuries related to *Calotropis* plucking, such as hand washing, wearing protective eyewear, and avoiding touching or rubbing the eye.

CONFLICTS OF INTEREST

No conflicts of interest.

ACKNOWLEDGEMENT

We would like to thank the Director General of Health Malaysia for his permission to publish this article.

REFERENCES

1. Mali RP, Rao PS, Jadhav RS. A review on pharmacological activities of *Calotropis procera*. *J Drug Deliv Ther* 2019; 9:947-51.
2. Kuriachen PM, Dave Y. Structural, developmental and histochemical studies in the collectors of *Calotropis procera* (Asclepiadaceae). *J Phytological Res* 1989; 2:7-1.
3. Samar K Basak, Arup Bhaumik, Ayan Mohanta, Prashant Singhal. Ocular toxicity by latex of *Calotropis procera*. *Indian J Ophthalmol*: 2009; 57:2
4. Biedner B, Rothkoff L, Witztum A. *Calotropis procera* (Sodom apple) latex keratoconjunctivitis. *Isr J Med Sci* 1977; 13:914-6.
5. Al-Mezaine HS, Al-Rajhi AA, Al-Assiri A, Waggoner MD. *Calotropis procera* (Ushaar) keratitis. *Am J Ophthalmol* 2005; 139:199-202.
6. Devasari T. Toxic effects of *Calotropis procera*. *Indian J Pharmacol* 1965; 27:272-5
7. Tomar V, Agarwal PK, Agarwal BL. Toxic iridocyclitis caused by *Calotropis*. *Indian J Ophthalmol*. 1970; 18:15e16.
8. Samar K Basak, Arup Bhaumik, Ayan Mohanta, Prashant Singhal. Ocular toxicity by latex of *Calotropis procera*. *Indian J Ophthalmol*: 2009; 57:232-234.
9. Basak SK, Bhaumik A, Mohanta A, Singhal P. Ocular toxicity by latex of *Calotropis procera*. *Indian J Ophthalmol*. 2009; 57:232e234.
10. Kumar VL, Shivkar MY. Involvement of prostaglandins in inflammation induced by latex of *Calotropis procera*. *Mediators Inflamm*. 2004;13:151e155.
11. Col Shrikant Waikar, Brig V.K. Srivastava, *Calotropis* induced ocular toxicity. *Medical journal Armed Forces India*: 2015;71:92-94
12. Jain V.K, Kesarwani D, Yadav Vishal, Sharma Kumudini, *Calotropis* induced corneal toxicity in Indian medicinal use: A rare case report with review of literature. *TNOA Journal of ophthalmic science and research*: 2020 ;58;37-39.
13. Bahkir FA, Spectrum of *Calotropis procera* latex-induced ocular toxicity. *Journal of clinical Ophthalmology and research (JCOR)*: 2020;8;125-127