

# Ocular Anticholinergic Toxicity from *Datura arborea*: A Reversible Mimic of Third Nerve Pals

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## Abstract

Unilateral fixed mydriasis is frequently associated with neurologic emergencies such as third cranial nerve palsy. However, rare toxicologic mimics-particularly those caused by topical exposure to anticholinergic alkaloids-may present similarly and lead to unnecessary neuroimaging. *Datura arborea*, an ornamental plant of the Solanaceae family, contains potent tropane alkaloids capable of inducing transient pharmacologic mydriasis via muscarinic receptorblockade. A 42-year-old previously healthy male developed sudden-onset blurred near vision and photophobia in the left eye shortly after accidental ocular contact with a flowering plant branch. Examination revealed left-sided dilated, nonreactive pupil with preserved extraocular movements, intact lid position, and impaired accommodation. Neurologic and fundoscopic examinations were unremarkable. A retrieved plant specimen was identified as *Datura arborea* by a consulting botanist. Pharmacologic testing with 1% pilocarpine produced no miosis, confirming muscarinic antagonism. The patient was managed conservatively with ocular irrigation, lubrication, and photoprotection. Symptoms resolved completely within 48 hours without recurrence. Topical exposure to *Datura arborea* can produce unilateral pharmacologic mydriasis that closely mimics third nerve palsy. Early recognition, targeted exposure history, and bedside pupillary testing can guide appropriate management and help avoid unnecessary neurologic evaluation.

**Keywords:** Anisocoria, anticholinergic, *datura arborea*

## Introduction

Acute-onset anisocoria, particularly when unilateral and accompanied by impaired pupillary reactivity, is frequently viewed as a potential indicator of life-threatening neurologic pathology, including third cranial nerve palsy, posterior communicating artery aneurysm, or transtentorial herniation (1). In emergency settings, such presentations often prompt urgent neuroimaging and specialist consultation. However, not all cases of fixed mydriasis are neurogenic in origin. Pharmacologic mydriasis, although benign and reversible, remains an under recognized diagnostic mimic that can result in unnecessary investigations and patient anxiety.

A range of pharmacologic agents and environmental exposures may lead to nonreactive pupil dilation. Among these, certain ornamental plants of the *Solanaceae* family-particularly *Datura arborea* (syn. *Brugmansia arborea*), commonly known as Angel's Trumpet-contain high concentrations of tropane alkaloids such as atropine, scopolamine, and hyoscyamine (2,3). These compounds are potent competitive antagonists of muscarinic receptors. When

introduced topically into the eye, they block M3 receptors in the iris sphincter and ciliary muscle, resulting in unopposed sympathetic activity, loss of pupillary constriction, and accommodation paralysis (4,5). Clinically, this manifests as a fixed, dilated pupil with blurred nearvision-features that may closely resemble neuro-ophthalmologic emergencies.

Here in, we describe a case of unilateral pharmacologic mydriasis in an adult male following inadvertent ocular contact with *Datura arborea*. This case underscores the diagnostic value of detailed environmental history, the utility of bedside pharmacologic testing, and the importance of recognizing toxicologic mimics of neurologic syndromes.

## Case Report

A 42-year-old previously healthy male presented to the emergency department (ED) with sudden-onset blurred vision and photophobia in the left eye. The symptoms began approximately one hour after a low-hanging plant branches struck the leftside of his face while he was playing soccer in a public park. He denied direct trauma to the globe,

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**Received:** 14.05.2025 • **Accepted:** 20.06.2025

**DOI:** 10.33706/jemcr.1698743

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**Cite this article as:** Kocairi G, Golcuk Y, Türkmen TB. Ocular Anticholinergic Toxicity from *Datura arborea*: A Reversible Mimic of Third Nerve Pals. Journal of Emergency Medicine Case Reports. 2025;16(3): 102-104

foreign body sensation, eyedrops or medications, diplopia, headache, or systemic complaints. Review of systems was negative for fever, dry mouth, confusion, urinary retention, or tachycardia.

On examination, the patient's vital signs were stable. The left pupil was dilated to approximately 7 mm, round, and unresponsive to both direct and consensual light (Figure-1). The right pupil measured 3 mm and was briskly reactive. Extraocular movements were full and symmetric bilaterally, and there was no ptosis. Visual acuity was 20/20 in the right eye and 20/80 for near vision in the left eye. The patient reported difficulty with near focusing, consistent with accommodation loss. Slit-lamp examination revealed clear corneas without epithelial staining, and deep, quiet anterior chambers. Mild bilateral conjunctival hyperemia was present. Intraocular pressures were 16 mmHg bilaterally. Fundoscopic evaluation showed sharp optic disc margins without signs of papilledema, hemorrhage, or retinal abnormalities. The remainder of the neurologic examination, including cranial nerve, motor, and cerebellar testing, was unremarkable.

While still in the ED, the patient's relatives returned with a fresh sample of the branch involved in the incident. The plant featured large, pendulous, trumpet-shaped yellow flowers. In consultation with a local plant taxonomist, the specimen was conclusively identified as *Datura arborea*-a toxic plant well-known for its anticholinergic properties.

Given the absence of neurologic signs and the suspicion of anticholinergic ocular exposure, a bedside pharmacologic test was performed. One percent pilocarpine was instilled in to the affected eye. After 30 minutes, the left pupil remained fully dilated and nonreactive, confirming the diagnosis of pharmacologic mydriasis due to muscarinic receptor blockade. Neurology and ophthalmology services were consulted, and both agreed that no further imaging or intervention was required.

Management consisted of ocular irrigation, preservative-free artificial tears, and photoprotection with sunglasses. The patient was observed for several hours and discharged without patient follow-up. At 48-hour telephone reassessment, the patient reported complete resolution of symptoms, including restoration of near vision and normalization of pupillary size and reactivity.



**Figure 1.** The left pupil was dilated to approximately 7 mm

## Discussion

This case highlights a benign but diagnostically challenging form of anisocoria resulting from direct ocular exposure to *Datura arborea*. The pathophysiologic mechanism is well-established: tropane alkaloids within the plant competitively antagonize muscarinic M3 receptors in the iris sphincter and ciliary muscle, leading to mydriasis and cycloplegia (4-6). The resulting fixed pupil and loss of near focus can mimic serious neuro-ophthalmologic disorders such as third nerve palsy.

Importantly, distinguishing pharmacologic mydriasis from neurologic causes is essential to avoid unnecessary diagnostic procedures. In this case, the absence of ptosis or ophthalmoplegia, preserved visual acuity, normal intraocular pressures, and a clear exposure history all pointed toward a toxicologic etiology. The pilocarpine test is a simple but powerful diagnostic tool: 1% pilocarpine causes miosis in pharmacologic blockade, whereas denervated pupils (as seen in Adie syndrome or third nerve palsy) typically constrict due to supersensitivity (6).

The literature contains multiple case reports of similar presentations. Have lius and Asman described a series of seven adults with unilateral mydriasis following exposure to *Datura suaveolens*, all of whom recovered within 72 hours without specific therapy (7). Pediatric cases involving both *Datura* and *Brugmansia* species have also been reported, often in the context of outdoor play or unintentional plant contact (8,9). Direct instillation of plant sap in to the eye has occasionally been associated with corneal epithelial toxicity and transient tachycardia, although such complications are rare with simple surface exposure (10).

The current case reinforces the importance of detailed environmental history-taking in cases of isolated anisocoria. Early identification of the toxicologic cause permitted appropriate reassurance, avoided unnecessary neuroimaging, and ensured prompt symptomatic management. From a public health perspective, increased awareness of ornamental plant toxicity may help reduce similar presentations.

## Conclusion

Unilateral pharmacologic mydriasis resulting from *Datura arborea* exposure represents a reversible and benign condition that can closely mimic emergent neurologic disorders. Recognition of this clinical entity relies on careful history-taking, exclusion of neurologic deficits, and bedside pilocarpine testing. Awareness of such toxicologic mimics is essential for emergency physicians and ophthalmologists to prevent diagnostic delays, patient distress, and costly interventions.

**Conflict of interest:** None

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