Case Report

Unilateral Pharmacologic Mydriasis Following Accidental Ocular Exposure to Tiotropium Bromide: Case Report

Ratnali Gandhi[1], Neha Shilpy[2], Abhishek Chandra[3*], Govind Khalko[2]

[1]JR2

[2]Consultant Netrodaya The Eye City

[3]Director Netrodaya The Eye City

Abstract

Purpose: To report a case of unilateral pharmacologic mydriasis following accidental ocular exposure to tiotropium bromide.

Methods: A 35-year-old male presented with diminished near vision in the right eye. Examination revealed a dilated, non-reactive pupil in the affected eye with otherwise normal ocular findings. There was no history of any topical or oral medication. After a detailed history, it was found that he works in a paint factory. Imaging studies were unremarkable. After a detailed examination, it was found that he was exposed to tiotropium bromide.

Results: A diagnosis of pharmacologic mydriasis was made, and the patient was managed conservatively.

Conclusion: Accidental ocular exposure to tiotropium bromide can cause transient unilateral mydriasis. Awareness of this condition is important to avoid unnecessary investigations and ensure appropriate management.

Keywords: Tiotropium bromide, Pharmacologic mydriasis, Anticholinergic, Unilateral dilated pupil, Ocular exposure.

Introduction

Tiotropium bromide is a long-acting anticholinergic agent commonly used as an inhalational bronchodilator in chronic obstructive pulmonary disease and asthma. Its mechanism involves inhibition of muscarinic receptors, leading to smooth muscle relaxation in the airways.

Ocular exposure to anticholinergic agents can result in pupillary dilation due to blockade of the iris sphincter muscle. Such presentations may mimic serious neurological conditions, including third nerve palsy or acute angle-closure glaucoma. Although reported with other inhaled anticholinergics, isolated cases involving tiotropium are relatively rare.

We report a case of unilateral pharmacologic mydriasis following accidental ocular exposure to tiotropium bromide in a pharmaceutical worker.

Case Report

A 35-year-old male worker by occupation presented with complaints of diminished near vision in the right eye following accidental instillation of tiotropium bromide. The patient denied pain, redness, diplopia, or headache.

On examination, best-corrected visual acuity for distance was 6/6 in both eyes. Near vision was N36 in the right eye and N6 in the left eye. The right pupil measured approximately 6 mm and was non-reactive to light, while the left pupil was normal (Figure 1).

Anterior segment evaluation with slit-lamp examination was unremarkable. Intraocular pressure was within normal limits in both eyes. Fundus examination revealed healthy optic discs and normal macula with preserved foveal reflex.

Optical coherence tomography showed a normal macular contour with an average retinal thickness of 278.5 µm. Extraocular movements were full, and no signs of uveitis or optic neuropathy were observed.

Address for correspondence: Abhishek Chandra
Director Netrodaya The Eye City
E-mail: abhishekvinita@gmail.com

How to cite this article: Gandhi R, Shilpy N, Chandra A, Khalko G. Unilateral Pharmacologic Mydriasis Following Accidental Ocular Exposure to Tiotropium Bromide: Case Report. UP Journal of Ophthalmology. 2026;14(1): 42-43.
Received: 01-03-2026, **Accepted:** 22-03-2026, **Published:** 02-04-2026

UP JOURNAL OF OPHTHALMOLOGY
An Official Journal of Uttar Pradesh State Ophthalmological Society, UPSOS (Northern Ophthalmological Society, NOS)
p-ISSN: 2319-2062 | DOI: 10.56692/upjo.2026140109

EXAMINATION

	OD	OS
Visual Acuity by Snellen	6/6	6/6
Near Vision by Jaeger	N36	N6
Conjunctiva	Normal	Normal
Cornea	Clear	Clear
Anterior Chamber	Quiet VH4	Quiet VH4
Pupil	7mm	2mm
Lens	Normal	Normal
Fundus	Normal	Normal

Figure 1: Examination of OD and OS of patient

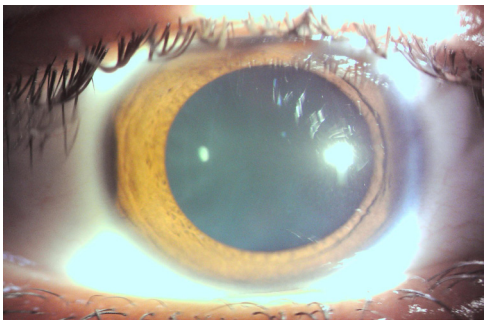

Figure 2: Day 1 of presentation

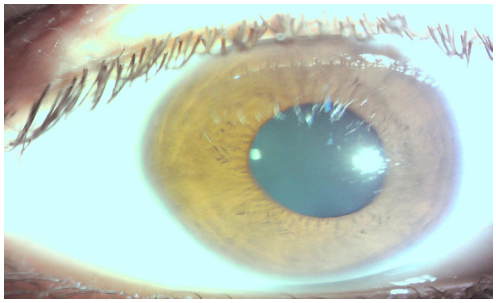

Figure 3: Day 3 of presentation

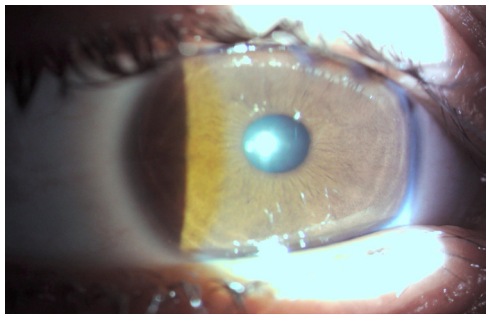

Figure 4 : Day 7 of presentation

Based on clinical findings and history, a diagnosis of unilateral pharmacologic mydriasis secondary to tiotropium bromide exposure was made. The patient was managed conservatively with observation. At follow-up, symptoms improved gradually (Figures 2-4).

Discussion

Pharmacologic mydriasis occurs due to inhibition of parasympathetic innervation to the iris sphincter muscle. Anticholinergic drugs such as tiotropium can induce this effect when they come into contact with ocular tissues.

Unilateral mydriasis requires careful evaluation to rule out life-threatening conditions such as an intracranial aneurysm causing third nerve palsy. However, distinguishing features of pharmacologic mydriasis include the absence of ptosis, preserved extraocular movements, and lack of associated neurological symptoms.

Similar cases have been reported with inhaled anticholinergic agents like ipratropium bromide, where aerosol leakage or improper handling leads to ocular exposure. Occupational exposure, as seen in this case, represents an additional risk factor.

The condition is self-limiting and typically resolves without intervention. Management involves reassurance and observation. Preventive measures include proper drug handling, use of protective equipment, and clear labeling.[1-6]

Conclusion

Accidental ocular exposure to tiotropium bromide can lead to transient unilateral pharmacologic mydriasis with visual disturbance. Recognition of this benign condition is essential to avoid unnecessary diagnostic procedures. Proper awareness and preventive strategies are important, especially among healthcare and pharmaceutical workers.

References

1. Gross NJ. Tiotropium bromide. Chest. 2004;126:1946–1953.
2. Fraunfelder FT, Meyer SM. Ocular toxicity of anticholinergic drugs. Am J Ophthalmol. 1984;98:746–752.
3. Kalra L, Bone MF. Unilateral mydriasis due to ipratropium bromide. BMJ. 1988;296:1025–1026.
4. Pandit RJ, Gales BJ. Accidental ocular exposure to anticholinergic bronchodilators causing mydriasis. Ann Pharmacother. 2002;36:319–321.
5. Sethi HS, Naik M. Pharmacological mydriasis: Diagnosis and management. Indian J Ophthalmol. 2017;65:1341–1345.
6. Fraunfelder FW. Drug-induced ocular side effects. 7th ed. Elsevier; 2014.