



(CASE REPORT)



A RARE CAUSE OF UNILATERAL MYDRIASIS: ADIE'S PUPIL

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World Journal of Advanced Research and Reviews, 2026, 31(03), 1874–1877

Publication history: Received on 07 August 2026; revised on 15 September 2026; accepted on 17 September 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.31.3.2396>

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ABSTRACT

Introduction: Adie's tonic pupil is a benign neuro-ophthalmological condition caused by postganglionic parasympathetic denervation of the ciliary ganglion or short ciliary nerves. It predominantly affects young women and presents as unilateral mydriasis with loss of the light reflex and a tonic response to accommodation. Although the prognosis is favorable, accurate diagnosis is essential to rule out potentially serious neurological causes, particularly third cranial nerve palsy.

Methods: We report the case of a 19-year-old female patient with no significant medical history, presenting with visual discomfort without decreased visual acuity. A complete ophthalmologic and neurological examination was performed, along with an etiological work-up including brain CT and viral serologies. The diagnosis was confirmed using a diluted pilocarpine test (0.125%).

Results: Examination revealed anisocoria, with a dilated right pupil unresponsive to direct and consensual light and showing a tonic response to accommodation; the left pupil was normal. Brain CT, viral serologies, and neurological examination were unremarkable, with no third cranial nerve involvement and preserved osteotendinous reflexes. Instillation of diluted pilocarpine produced selective constriction of the right pupil, confirming denervation supersensitivity and establishing the diagnosis of unilateral right Adie's tonic pupil. No specific treatment was initiated, and the clinical course was favorable, with progressive resolution of symptoms and preserved visual acuity.

Discussion/Conclusion: This case illustrates the typical clinical and pharmacological features of Adie's tonic pupil and confirms the diagnostic value of the diluted pilocarpine test. Recognizing this condition allows unnecessary investigations to be avoided and patients to be reassured, given the generally favorable, self-limited prognosis associated with this disorder.

Keywords: Adie's Tonic Pupil; Anisocoria; Mydriasis; Pilocarpine; Case Report

1 INTRODUCTION

Adie's tonic pupil is a benign neuro-ophthalmological condition resulting from postganglionic parasympathetic denervation of the ciliary ganglion or the short ciliary nerves [1;2]. It primarily affects young women and presents as unilateral mydriasis associated with the loss of the photomotor reflex and a tonic response to accommodation [2;3]. Although the prognosis is favorable, diagnosis is particularly important to rule out potentially serious neurological causes, including third cranial nerve palsy or drug-induced mydriasis.[3]

2 CASE REPORT

A 19-year-old female patient with no significant past medical history presented with visual discomfort but no decrease in visual acuity.

The ophthalmologic examination revealed corrected visual acuity of 10/10 in both eyes, for both distance and near vision. The cornea was clear, and the anterior chamber depth was normal.

Pupillary examination revealed anisocoria. The right pupil was dilated, unresponsive to direct and consensual light, with a slow reaction during accommodation. The left pupil was constricted and exhibited a normal photomotor reflex.

The fundus was unremarkable.

The etiological workup included a normal brain CT scan and negative viral serology tests. The neurological examination was entirely normal, with no involvement of the third cranial nerve or loss of osteotendinous reflexes. The test with 0.125% pilocarpine solution caused selective constriction of the right pupil, confirming the diagnosis of unilateral right Adie's tonic pupil.

No specific treatment was initiated. The course was favorable, with gradual resolution of visual disturbance and maintenance of normal visual acuity during follow-up.



Figure 1: Before test pilocarpine



Figure 2: After test pilocarpine

3 DISCUSSION

Adie's tonic pupil is a rare postganglionic parasympathetic neuropathy that causes cholinergic hypersensitivity due to denervation [4]. This hypersensitivity explains the paradoxical constriction observed following instillation of a low concentration of pilocarpine (0.125%), the gold-standard diagnostic test.[5]

The differential diagnosis primarily includes third cranial nerve palsy, pharmacological mydriasis, iris trauma, and other causes of anisocoria [3]. In our case, the absence of oculomotor deficits, normal brain imaging, the absence of neurological abnormalities, and a positive pharmacological test allowed us to rule out these diagnoses.

The etiology of Adie's tonic pupil remains idiopathic in the majority of cases [6,8]. Nevertheless, several mechanisms have been proposed. Viral infections (herpes viruses, influenza viruses, varicella-zoster, and more recently SARS-CoV-2), inflammatory or autoimmune diseases, orbital trauma, intraocular surgical procedures, and certain dysautonomic neuropathies have been reported as triggering factors [6;8]. A recent review highlights that viral infections are one of the most frequently described secondary causes, likely through an inflammatory or immune mechanism affecting the ciliary ganglion [6]. In our case, viral serology tests were negative and no recent history of infection was found, suggesting an idiopathic form—the most common in large published series.

In recent years, several case reports have described the occurrence of Adie's tonic pupil following viral infections, particularly after SARS-CoV-2 infection [8]. This hypothesis reinforces the potential role of an inflammatory or autoimmune mechanism directed against postganglionic parasympathetic fibers. Nevertheless, in our case, viral serology tests were negative and no recent history of infection was identified, suggesting an idiopathic form, which remains the most common presentation.

Complete Adie syndrome is characterized by a tonic pupil combined with diminished or absent osteotendinous reflexes [1,2]. However, this association is inconsistent, particularly in the early stages of the disease, as seen in our patient, whose reflexes were preserved.

Treatment is primarily symptomatic and is indicated only in cases of severe photophobia or difficulty with near vision. Simple monitoring is generally sufficient when symptoms are moderate [7]

4 CONCLUSION

Adie's tonic pupil is a rare cause of unilateral mydriasis in young patients. Its diagnosis relies on a thorough clinical examination, after ruling out neurological emergencies, and is confirmed by the diluted pilocarpine test [5]. Our case highlights the importance of recognizing this condition in order to avoid unnecessary investigations and to reassure the patient, as the prognosis is generally favorable with spontaneous resolution without specific treatment.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying image. Ethical approval was not required for this single case report in accordance with local institutional guidelines.

REFERENCES

- [1] Adie WJ. Pseudo-Argyll Robertson pupils with absent tendon reflexes: a benign disorder simulating tabes dorsalis. *Br Med J*. 1931;1:928-930.
- [2] Thompson HS. Adie's syndrome: some new observations. *Trans Am Ophthalmol Soc*. 1977;75:587-626.
- [3] Gross JR, McClelland CM, Lee MS. An approach to anisocoria. *Curr Opin Ophthalmol*. 2016;27(6):486-492.
- [4] Kardon RH, Corbett JJ, Thompson HS. Segmental denervation and reinnervation of the iris sphincter as shown by infrared videographic transillumination. *Ophthalmology*. 1998;105(2):313-321.
- [5] Leavitt JA, Wayman LL, Hodge DO, Brubaker RF. Pupillary response to four concentrations of pilocarpine in normal subjects. *Am J Ophthalmol*. 2002;133(3):333-336.
- [6] Zhang Y, Zhang M, Wang J, et al. Adie's Pupil: A Diagnostic Challenge for the Physician. *Med Sci Monit*. 2022;28:e934657.
- [7] StatPearls Publishing. Adie Syndrome. Treasure Island (FL): StatPearls Publishing; 2025.
- [8] Çakır GY, Paşaoğlu IB, Çakır İ, Solmaz B. Adie's tonic pupil after COVID-19: a case report and literature review. *Rom J Ophthalmol*. 2024;68(2):89-91.