Miller fisher syndrome mimicking cavernous sinus thrombosis and thyroid eye disease: A diagnostic dilemma in a hyperthyroid patient

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SUMMARY

Introduction: Miller Fisher Syndrome (MFS), a variant of acute inflammatory demyelinating polyneuropathy (AIDP), may mimic orbital diseases such as cavernous sinus thrombosis (CST) and thyroid eye disease (TED), creating significant diagnostic challenges. Case presentation: A 65-year-old hyperthyroid male who presented with bilateral eye pain, right (RE) lid drooping, left eye (LE) proptosis, diplopia, and gait instability. Examination revealed ophthalmoplegia and conjunctival injection bilaterally, complete RE ptosis, LE proptosis, and preserved optic nerve function. Neurological assessment demonstrated areflexia, involvement of cranial nerves III, IV, VI, and left VII, and positive cerebellar signs. Contrast-enhanced CT imaging showed left eye proptosis with bilateral cavernous sinus opacification. Cerebro-spinal fluid analysis revealed positive anti-ganglioside GQ1b antibodies, confirming MFS. He was treated with intravenous immunoglobulin (IVIg) and systemic antibiotics, with marked neurological and ocular improvement over six weeks. Conclusion: MFS can present with orbital features seen in CST and TED, awareness of neurogenic signs, particularly areflexia and preserved optic nerve function is crucial. Anti-GQ1b antibodies remain key to definitive diagnosis.

INTRODUCTION

MFS is a rare autoimmune neuropathy characterized by the triad of ophthalmoplegia, areflexia, and ataxia.[1,2] It is considered a variant of Guillain-Barré Syndrome (GBS) and is often associated with anti-GQ1b antibodies.[1,4] The overlapping clinical features of MFS with other orbital pathologies such as CST and TED can complicate the diagnostic process.[3] We present a case initially suspected to be CST and TED, emphasising the importance of thorough neurological evaluation in atypical ophthalmic presentations.

CASE PRESENTATION

A 65-year-old hyperthyroid male and chronic smoker presented with bilateral eye pain, RE swelling and redness, progressive drooping of the right eyelid, diplopia, headache, vomiting, and unsteady gait. Visual acuity was 6/12 in the RE and 6/24 in the LE. Pupillary response were normal with no relative afferent pupillary defect. Optic nerve function was preserved.

Examination revealed RE ptosis and axial LE axial proptosis (Figure 1). Extraocular movements were restricted in all directions bilaterally. The conjunctiva was injected, but there was no anterior chamber inflammation or raised intraocular pressure. Fundus examination was unremarkable.

Neurological assessment demonstrated global areflexia, involvement of cranial nerves III, IV, VI, and left VII, positive cerebellar signs, and impaired tandem gait.

A contrast-enhanced CT of the brain and orbits revealed LE proptosis and bilateral cavernous sinus opacification (Figure 2). Lumbar puncture and CSF analysis showed positive anti-GQ1b antibodies, confirming MFS.

He was treated with a five-day course of IVIg and empirical systemic antibiotics. After six weeks, the patient's ophthalmoplegia resolved, RE ptosis improved, and LE proptosis reduced. Neurologically, reflexes returned, gait normalized, and only a mild left VII cranial nerve palsy remained.

DISCUSSION

This case illustrates how MFS can masquerade as orbital pathology due to overlapping signs of ptosis, ophthalmoplegia, and proptosis. Although the initial presentation resembled CST or TED, the bilateral symmetrical ophthalmoplegia, preserved optic nerve function and associated systemic neurological findings were atypical for primary orbital disease. These key features prompted consideration of a neurogenic aetiology rather than an isolated orbital disorder.

Recent literature has expanded understanding of anti-GQ1b antibody syndromes, emphasising their diagnostic value in atypical neuro-ophthalmic presentations.[6] Updated reviews on Guillain–Barré variants also highlight the broad clinical spectrum of MFS and reinforce the need to recognise mimics early.[7]

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Table I: Differentiating features of MFS, CST and TED

Features	MFS	CST	TED
Onset	Acute, post-infectious	Acute, rapidly progressive	Subacute to chronic
Pain	Mild or absent	Severe	Usually mild
Optic nerve involvement	Rare	Common	Possible
Areflexia	Present	Absent	Absent
Ataxia	Common		
Cranial nerve palsies	II, IV, VI, VII common	III, IV, V1, V2, VI	Restrictive myopathy
Proptosis	Rare, mild	Possible	Common
Systemic features	Neurogenic	Fever, sinusitis	Hyperthyroid
Anti-GQ1b antibodies	Positive	Negative	Negative
Response to IVIg	Good	No	Variable
Imaging	Usually normal	Cavernous sinus changes	EOM enlargement with tendon sparing

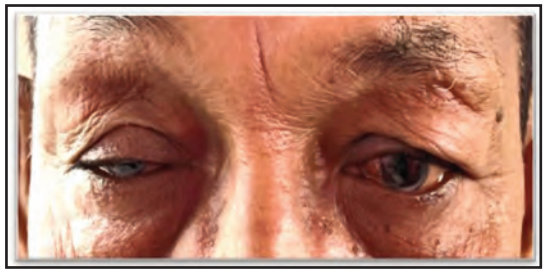

Fig. 1: Clinical photograph showing right upper eyelid ptosis and left axial proptosis at initial presentation

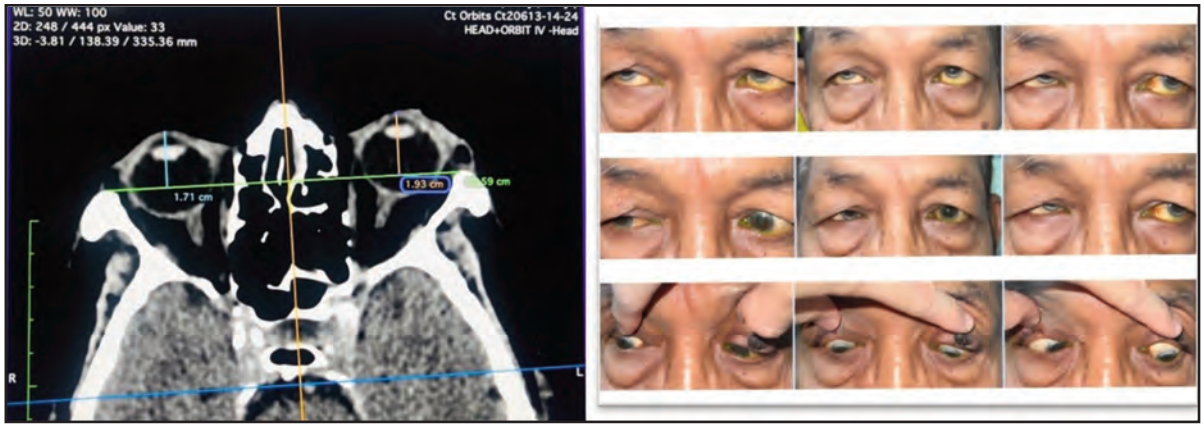

Fig. 2: Initial Contrast-enhanced CT orbit demonstrating LE proptosis and bilateral cavernous sinus opacification (A). Sixth-week post-IVIg treatment, marked resolution of ophthalmoplegia and improvement in ptosis and proptosis (B). – Post-treatment imaging not done

Misdiagnosis of MFS may lead to delayed immunotherapy and unnecessary investigations or treatments. Early testing for anti-GQ1b antibodies is therefore crucial, as these antibodies are highly specific for MFS and correlate with disease severity.[1,5]

Radiological findings in MFS are often nonspecific with imaging changes frequently reflecting mimicking pathology rather than the underlying neuropathy. CT findings may be misleading, as cavernous sinus fullness can be present even in non-thrombotic conditions. In this case, imaging suggested CST, illustrating the diagnostic overlap.

From an ophthalmic standpoint, MFS can present with findings similar to CST and TED, such as ptosis, ophthalmoplegia, and proptosis (Table 1). The presence of systemic neurological signs, such as ataxia and areflexia, should prompt consideration of a neurological etiology.

While intravenous immunoglobulin is the standard of therapy, residual cranial nerve deficits may persist.[2,4] In our case, the persistence of LE proptosis in our case raises the possibility of concurrent TED, especially given the patient's hyperthyroidism and a dual pathology of TED overlapping with MFS may be considered. Further orbital imaging or TSH-receptor antibody testing may help clarify whether TED contributed to the presentation. This highlights the importance of monitoring for dual pathology in patients with underlying thyroid disease and the need for ongoing monitoring to distinguish residual orbital pathology from neurological recovery.

This case underscores the value of multidisciplinary collaboration, particularly between ophthalmologists, neurologists, and radiologists in evaluating atypical presentations, thereby ensuring timely diagnosis and optimal management.

CONCLUSION

Miller Fisher Syndrome can closely mimic orbital diseases such as CST and TED, awareness of neurogenic clues, particularly areflexia and preserved optic nerve function, is essential. Anti-GQ1b antibodies remain key to definitive diagnosis.

PATIENT CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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