World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Check for updates

# Ophthalmologic presentation of pediatric multiple sclerosis: A report of three cases

S. Lekbich *, I. Jane, H. Moutei, F. Chraibi, M. Abdellaoui and I. Benatiya Andaloussi

*Department of Ophthalmology, Hassan II University Hospital of Fez, Faculty of Medicine and Pharmacy of Morocco.*

World Journal of Advanced Research and Reviews, 2026, 29(03), 1316-1322

Publication history: Received on 07 February 2026; revised on 14 March 2026; accepted on 17 March 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.3.0656

## Abstract

**Background**: Pediatric multiple sclerosis (MS) is a rare but potentially disabling inflammatory demyelinating disorder of the central nervous system. Ocular manifestations may be the initial presentation and require urgent evaluation.

**Cases**: We report three pediatric cases in which MS was revealed by ophthalmologic symptoms: (1) a 10-year-old boy with severe unilateral optic neuritis; (2) a 13-year-old boy presenting with left abducens nerve palsy and multiple active MRI lesions; and (3) a 13-year-old girl with decreased vision in the left eye and hyalitis, later confirmed to have white-matter demyelinating lesions.

**Conclusion**: Ophthalmic manifestations may be the first sign of MS in children. Prompt recognition and multidisciplinary management are crucial to prevent long-term neurological sequelae.

**Keywords:** Pediatric multiple sclerosis; Optic neuritis; Abducens palsy; Neuro-ophthalmology; Demyelinating disease

## 1. Introduction

Multiple sclerosis (MS) is a chronic inflammatory demyelinating disease of the central nervous system and represents the most common disabling neurological condition in young adults. Pediatric-onset MS is rare, accounting for a minority of all MS cases and an incidence estimated below 1 per 100,000 children per year. In children, the disease often presents with multifocal symptoms, and ophthalmologic manifestations—particularly optic neuritis and ocular motor palsies—may be early or even inaugural signs. Early recognition of these symptoms is essential because prompt diagnosis and treatment may reduce the risk of extended neurological damage and disability.

We report three pediatric cases where MS was revealed through ophthalmologic presentations.

## 2. Patients and methods

We conducted an observational descriptive report of three pediatric patients presenting to the Ophthalmology Department of Hassan II University Hospital of Fez. All three cases exhibited ophthalmologic symptoms that led to further neurological evaluation and subsequent diagnosis of multiple sclerosis according to the revised 2017 McDonald criteria, based on clinical presentation, MRI evidence of demyelinating lesions, and exclusion of alternative diagnoses.

* Corresponding author: S. Lekbich

Comprehensive eye examination included best-corrected visual acuity, pupillary reflexes, ocular motility, slit-lamp examination of the anterior segment, and dilated fundus examination. Neuroimaging with brain and orbital MRI and biological investigations including CSF analysis and, when indicated, anti-MOG antibodies were performed.

### 2.1. Case 1: Severe unilateral optic neuritis in a 10-year-old boy

A 10-year-old boy with a previous episode of transient monoparesis, which had resolved spontaneously, presented with sudden onset of right eye vision loss associated with pain during ocular movements, evolving over one month. There was no history of trauma or infection. On examination, visual acuity in the right eye was limited to light perception, with normal ocular motility and an unremarkable anterior segment. Fundus examination revealed a temporally pale optic disc with blurred margins(figure1), while the left eye appeared normal. Optical coherence tomography (OCT) of the right eye demonstrated marked thinning of the retinal nerve fiber layer and ganglion cell complex, consistent with severe optic nerve atrophy.(figure2) Visual field testing showed complete loss in the right eye.(figure3) Brain MRI (T2 and FLAIR sequences) revealed multiple supra- and infratentorial hyperintense lesions, mild cerebral atrophy, and enhancement of the right optic nerve, consistent with inflammatory demyelinating optic neuritis.(figure4) Based on the clinical presentation and radiologic findings, a diagnosis of relapsing–remitting multiple sclerosis was established. The patient was initially treated with teriflunomide for one year, then switched to natalizumab following a relapse with increased lesion load. He has remained clinically and radiologically stable for the past 16 months

### 2.2. Case 2: Abducens nerve palsy in a 13-year-old boy

An 11-year-old boy with a recent history of COVID-19 infection presented with persistent binocular diplopia on lateral gaze for one month. Over the preceding two years, he had experienced intermittent episodes of transient diplopia. On ophthalmologic examination, visual acuity was preserved at 10/10 in both eyes. The right eye appeared normal, whereas the left eye showed an isolated abducens nerve palsy.(figure5)Brain MRI with contrast-enhanced T1 sequences revealed multiple active demyelinating lesions. On T2-weighted images, a lesion involving the fascicular portion of the right sixth cranial nerve was identified. FLAIR sequences demonstrated several additional hyperintense lesions, four of which enhanced after gadolinium administration.(figure6) Cerebrospinal fluid analysis showed the presence of oligoclonal bands. Anti-MOG antibody testing was negative. Based on the clinical, radiological, and laboratory findings, a diagnosis of early-onset multiple sclerosis was established. After resolution of the COVID-19 infection, the patient received high-dose intravenous corticosteroid pulses, followed by Rituximab therapy, with subsequent clinical improvement and stabilization.

### 2.3. Case 3: Hyalitis and visual loss in a 13-year-old girl

13-year-old girl with a one-year history of recurrent rotational vertigo presented with decreased visual acuity in the left eye. Six months earlier, she had experienced an episode of bilateral anterior uveitis that improved with topical corticosteroid therapy. Her mother had a known history of multiple sclerosis. On examination, the right eye appeared normal, whereas the left eye showed signs of intermediate uveitis without posterior involvement. (figure7) Brain MRI in T2-weighted sequences demonstrated multiple white matter hyperintensities consistent with demyelinating lesions of multiple sclerosis. (figure8)

She was treated with intravenous corticosteroids followed by oral taper and then immunomodulatory therapy. Visual acuity improved and vitreous inflammation regressed over time.

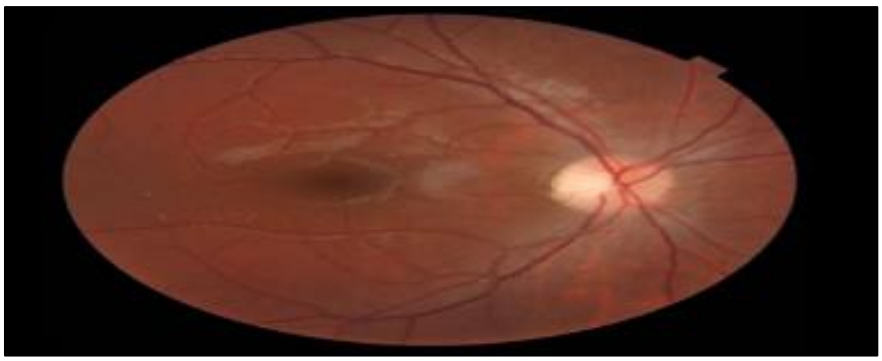

**Figure 1** Temporal optic disc pallor with blurred margins

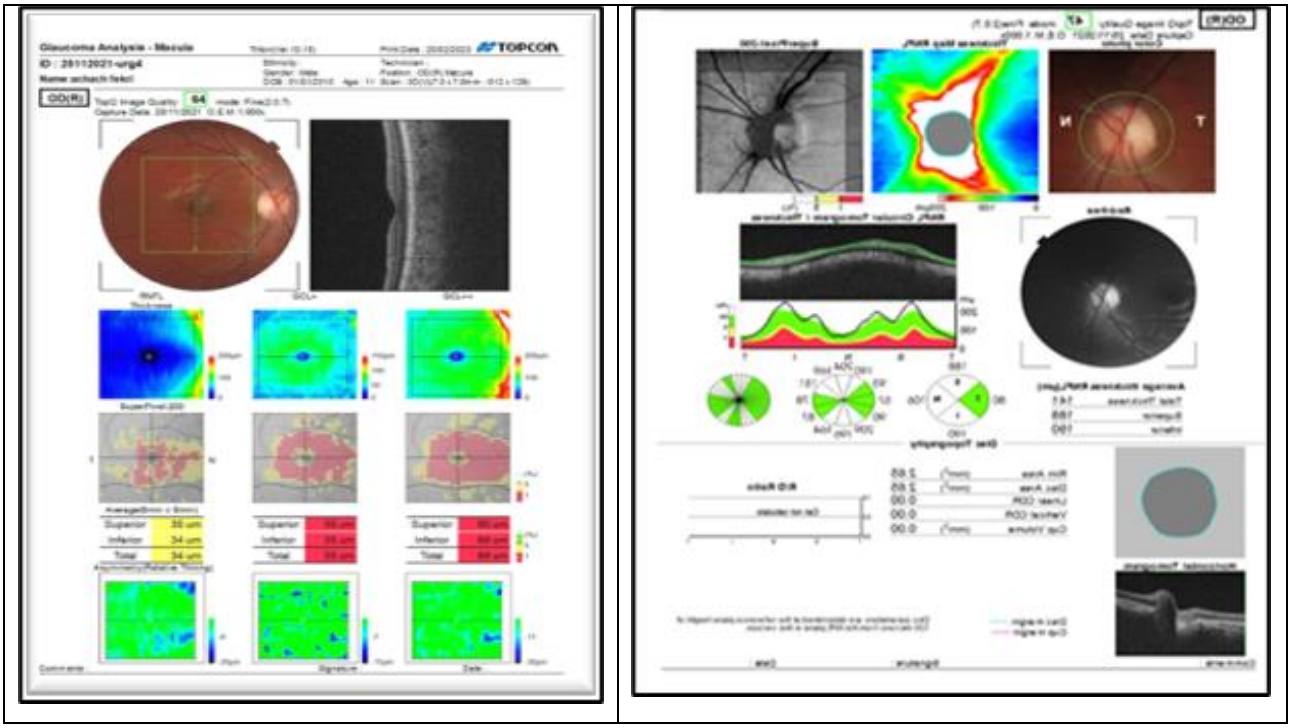

**Figure 2** Severe optic nerve atrophy with RNFL and GCC thinning on OCT

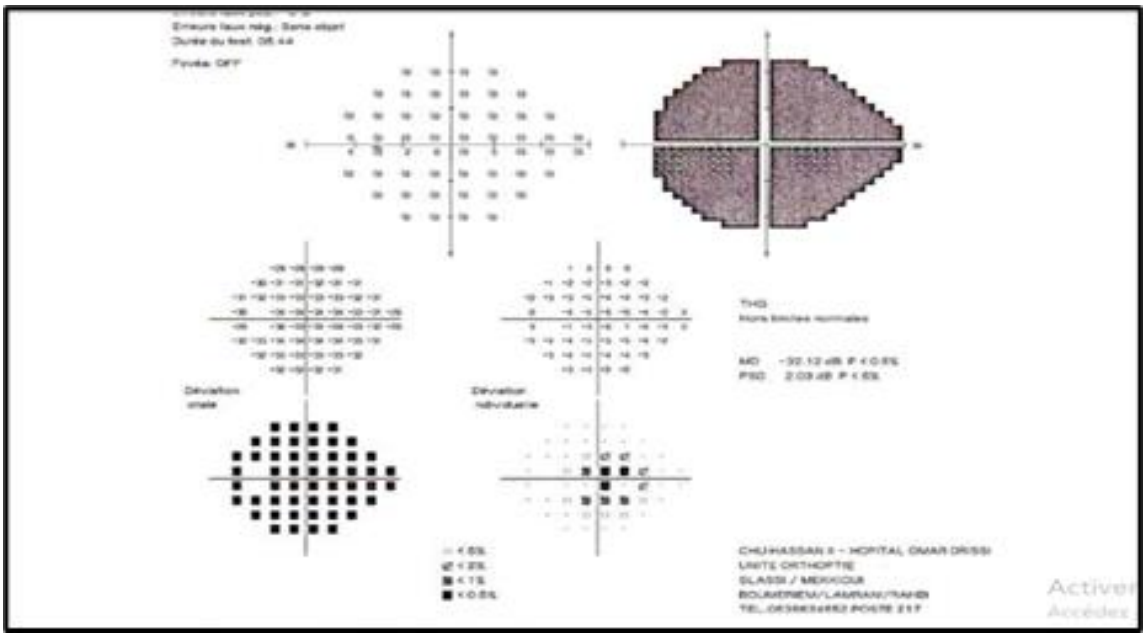

**Figure 3** Visual field testing showed complete loss in the right eye

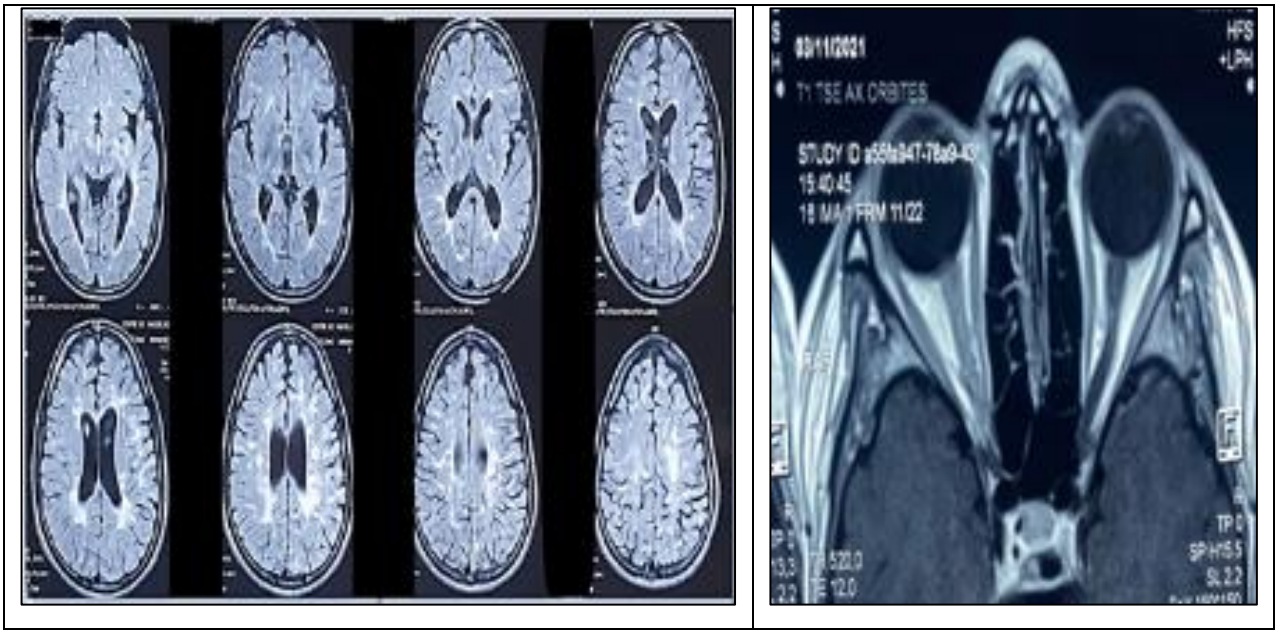


**Figure 4** Multiple supra- and infratentorial lesions with optic nerve enhancement on MRI, consistent with demyelinating optic neuritis

**Figure 5** Isolated left sixth nerve palsy

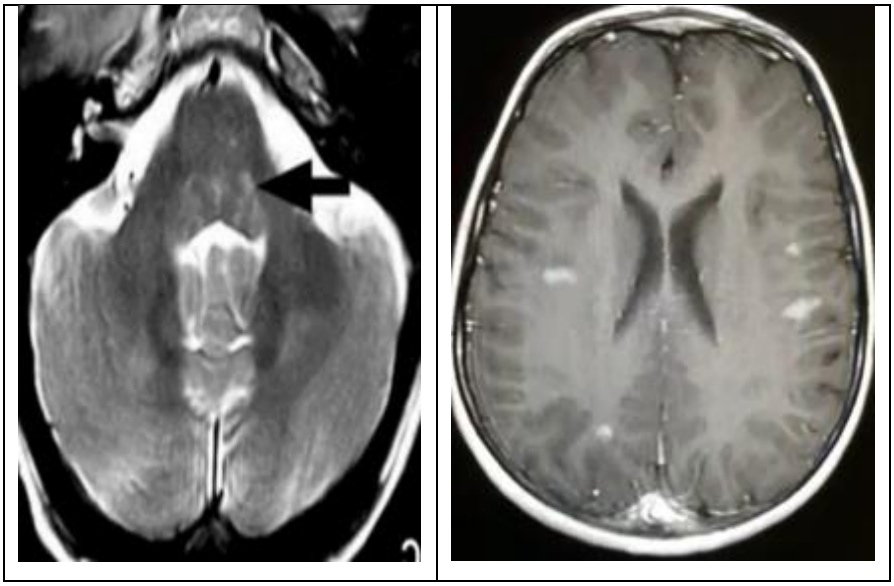

**Figure 6** Multiple active demyelinating lesions on MRI with involvement of the right sixth nerve

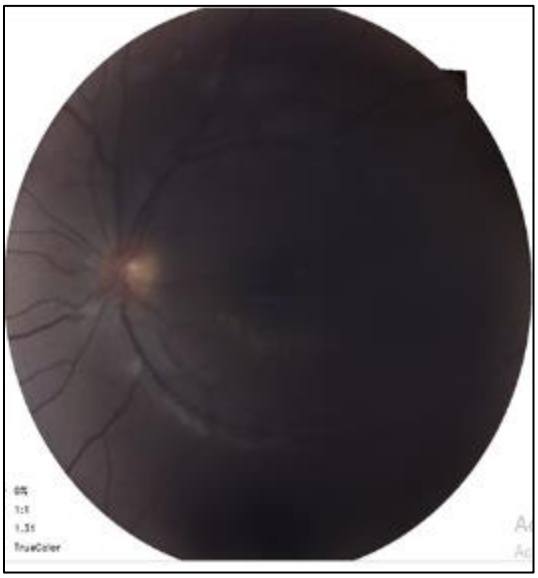

**Figure 7** Isolated intermediate uveitis

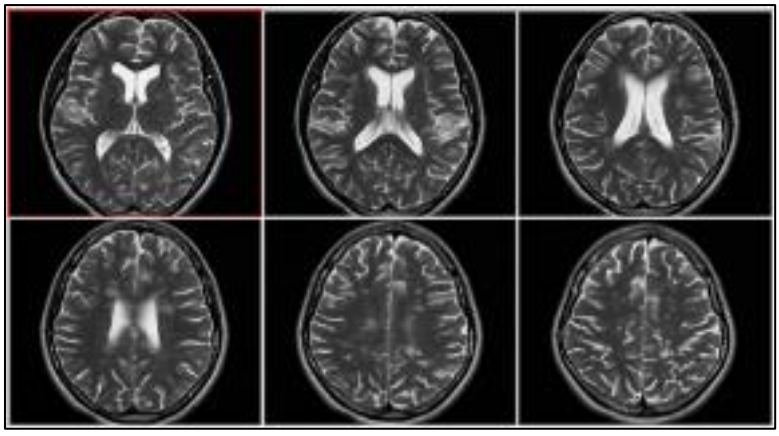

**Figure 8** Multiple white matter hyperintensities on T2 MRI consistent with demyelinating lesions of multiple sclerosis

## 3. Discussion

Pediatric multiple sclerosis (MS) is uncommon, representing only 0.4% to 10.5% of all MS cases, with an estimated prevalence ranging from 0.13 per 100,000 in France to 0.98 per 100,000 in the United Kingdom [1,2]. The median age of onset is around 12 years, with equal sex distribution before the age of 10, and a clear female predominance thereafter [3]. Environmental factors such as low sunlight exposure and vitamin D deficiency appear to play a role in disease susceptibility [4].

The biological mechanisms and diagnostic criteria of pediatric MS are similar to those observed in adults. According to Banwell et al. in a large cohort of 1,540 pediatric cases, the most common initial manifestations include motor and sensory disturbances as well as optic neuritis [5].

MRI plays a central role in the diagnosis of MS in children, providing evidence of dissemination in space and time. The 2017 McDonald criteria allow earlier diagnosis through incorporation of MRI findings and CSF oligoclonal bands [6]. Early recognition and treatment of pediatric MS are essential given the high inflammatory burden and the potential impact on neurodevelopment and long-term disability [7].

Regarding long-term management, interferon-based therapies are approved in children but are often poorly tolerated [8]. The PRADIGMS study confirmed the efficacy and safety of fingolimod in pediatric-onset MS [9]. Conversely, the TERIKIDS trial evaluating teriflunomide versus placebo did not demonstrate significant benefit [10]. Monoclonal antibodies such as natalizumab and rituximab have shown promising efficacy and tolerability in several pediatric case series [11].

## 4. Conclusion

Pediatric multiple sclerosis is rare but should always be considered in children with unexplained visual or neurological symptoms. Ophthalmologic signs may be the first clue to an underlying demyelinating disease. MRI and CSF analysis are crucial for early and accurate diagnosis. Prompt multidisciplinary management is vital to improving long-term visual and neurological outcomes in affected children.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

The authors declare no financial interests.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

## References

[1] Waldman A, Ness J, Pohl D, et al. Pediatric multiple sclerosis: clinical features and diagnosis. Neurology. 2016;87(Suppl 2):S74–S81.

[2] Chitnis T, Glanz B, Jaffin S, et al. Demographics of pediatric-onset multiple sclerosis in an MS center population. Neurology. 2009;73(16):1472–1477.

[3] Boiko A, Vorobeychik G, Paty D, et al. Early onset multiple sclerosis: a longitudinal study. Neurology. 2002;59(7):1006–1010.

[4] Munger KL, Levin LI, Hollis BW, et al. Serum 25-hydroxyvitamin D levels and risk of multiple sclerosis. JAMA. 2006;296(23):2832–2838.

[5] Banwell B, Ghezzi A, Bar-Or A, et al. Multiple sclerosis in children: clinical diagnosis and therapeutic strategies. Neurology. 2007;68(Suppl 2):S17–S23.

[6] Thompson AJ, Banwell BL, Barkhof F, et al. Diagnosis of multiple sclerosis: 2017 revisions of the McDonald criteria. Lancet Neurol. 2018;17(2):162–173.

[7] Gorman MP, Healy BC, Polgar-Turcsanyi M, et al. Increased relapse rate in pediatric-onset compared with adult-onset multiple sclerosis. Neurology. 2009;72(22):1746–1752.

[8] Tenembaum S, Chitnis T, Ness J, et al. Interferon beta therapy in pediatric multiple sclerosis. Mult Scler. 2013;19(10):1261–1269.

[9] Chitnis T, Arnold DL, Banwell B, et al. Trial of fingolimod versus interferon beta-1a in pediatric multiple sclerosis (PARADIGMS). N Engl J Med. 2018;379(11):1017–1027.