

# Posterior Circulation Vasculitis as an Atypical Manifestation of Lyme Neuroborreliosis: A Case Report



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## Introduction

Lyme disease is a tick-borne infection caused by *Borrelia burgdorferi*. Neurological involvement, or Lyme neuroborreliosis (LNB), occurs in approximately 10% of cases [1]. In rare instances, LNB may be complicated by cerebrovascular events due to vasculitis [2,3]

## Case report



### Remote pathological history

- A 35-year-old man
- Obesity
- Family history of sudden cardiac death, Parkinson's disease, and hypertension



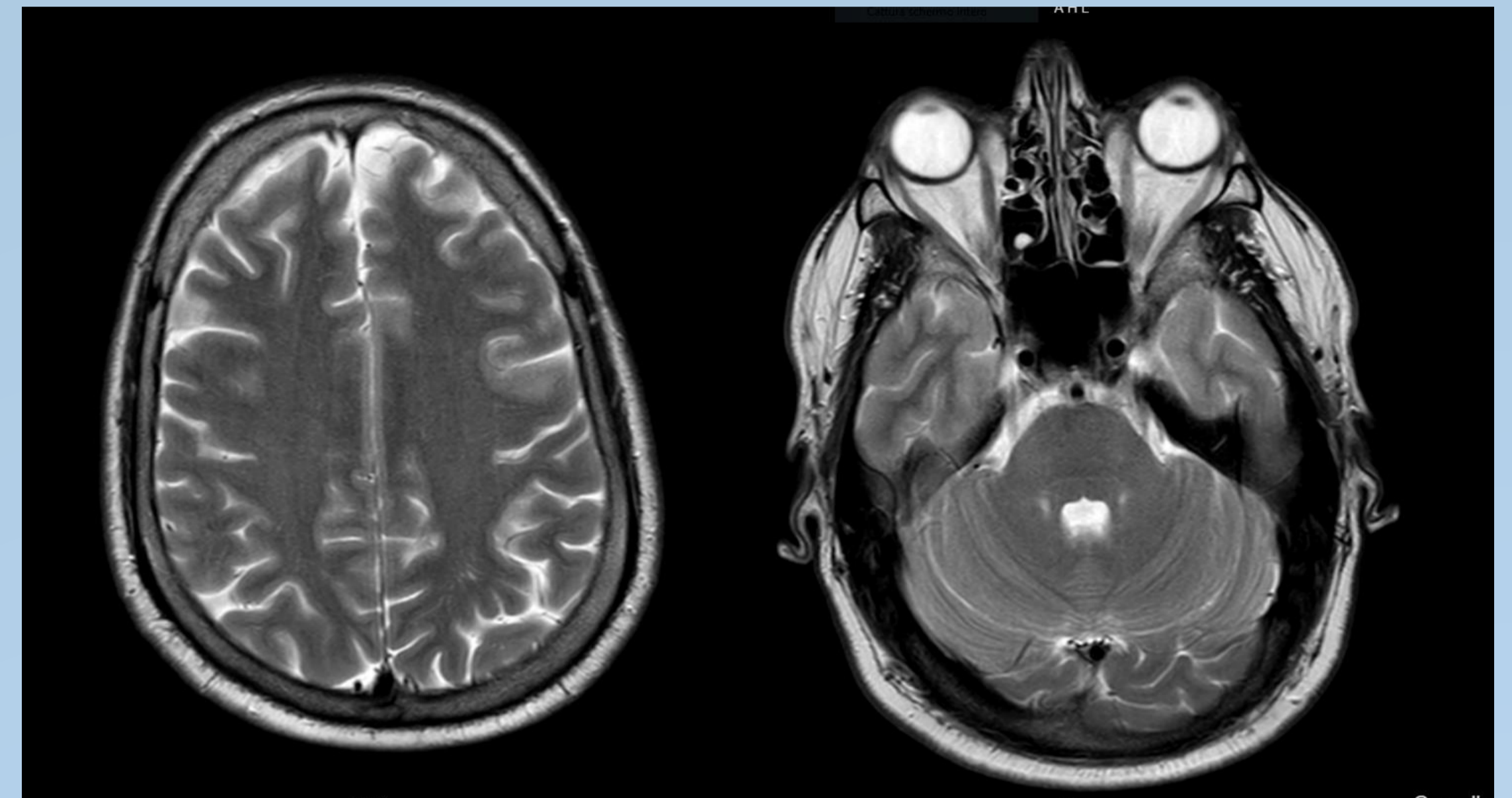
Admitted for sudden-onset severe nuchal headache and dysarthria.

On admission, **neurological exam**: dysarthria, bilateral gaze-evoked nystagmus, mild right hemiparesis, right dysmetria (NIHSS: 5)

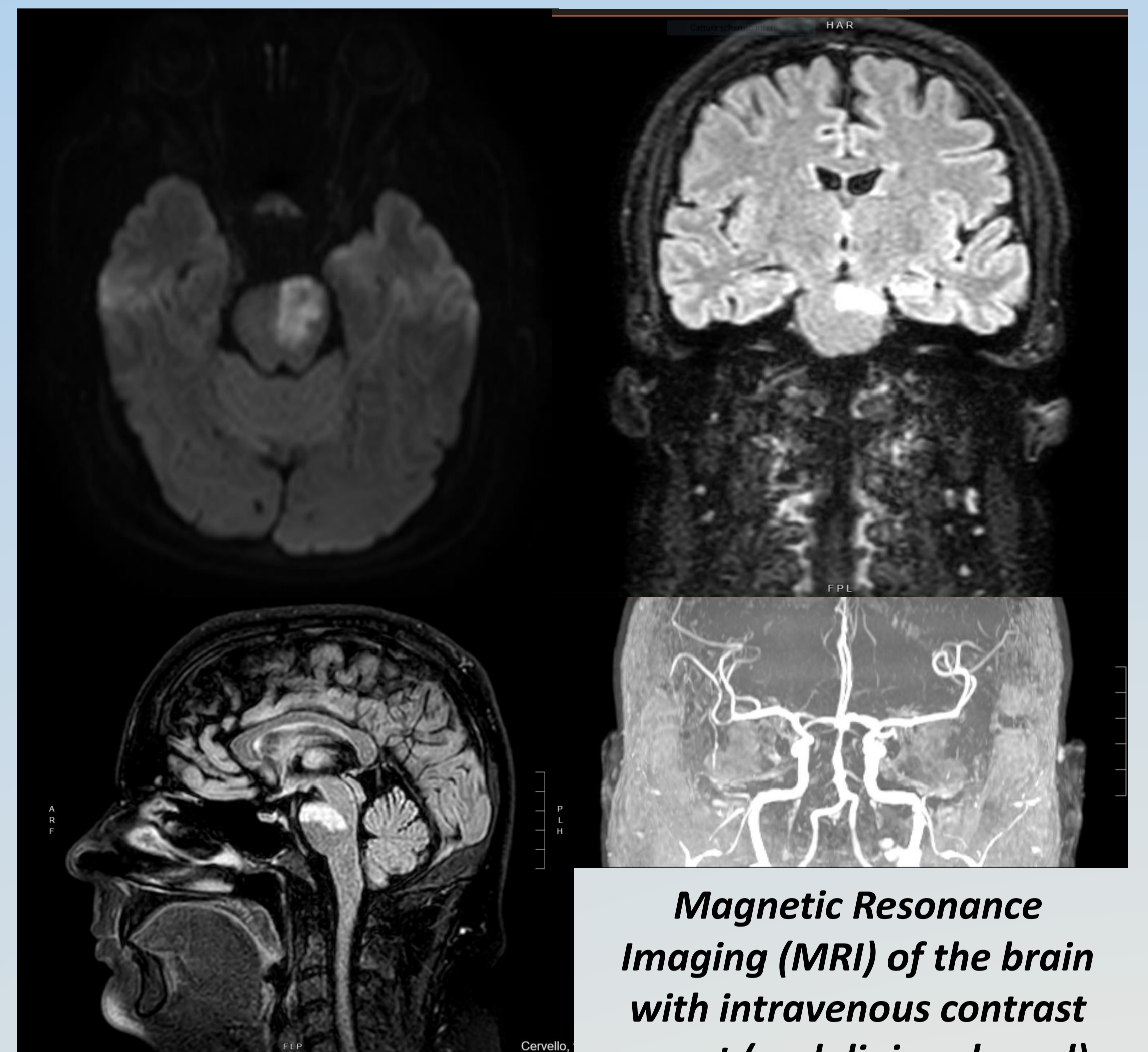


### Diagnostic work up

- **Brain CT**: hyperdensity of the basilar artery and right P1 segment of the posterior cerebral artery, suggesting cerebellar ischemia.
- **Initial non-contrast brain MRI** revealed diffusion-restricted lesions in the brainstem and middle cerebellar peduncles. A similar signal alteration is observed in the cortical region of the right parietal lobe.
- The next day, the patient's **neurological examination** was: ideomotor slowing, incoherent speech, fragmented saccades, and persistent right dysmetria appeared, without meningeal signs.
- **EEG**: normal.
- **CSF analysis**: lymphocytic pleocytosis (16 cells/mm<sup>3</sup>), elevated protein (85 mg/dL), and negative microbiological studies.
- **Brain MRI with contrast**: parenchymal enhancement, tissue swelling, and eccentric thickening of the basilar artery wall with distal narrowing—suggestive of vasculitis.
- **Whole-body PET-CT**: focal ileal uptake and heterogeneous skeletal activity, but oncologic workup was unremarkable.
- One week later, **serum IgM for *Borrelia*** was positive (28.39 [index] [Negative: <9, Borderline: 9-11, Positive: >11]).
- Retrospectively, the patient reported prior insect bites and a pustular rash on the lower limbs.



First brain MRI



Magnetic Resonance Imaging (MRI) of the brain with intravenous contrast agent (gadolinium-based) after 1 week

### Therapy

→ Based on clinical, radiological, and CSF findings, **intravenous methylprednisolone** was started for suspected autoimmune encephalitis or inflammatory vasculitis of the posterior circulation.

→ Oral **doxycycline** was initiated for suspected vasculitic LNB.



### Follow-up

One-month follow-up **brain MRI with contrast**: reduced swelling of the pontomesencephalic lesion, now non-enhancing and with CSF-like areas. Basilar artery wall thickening and enhancement persisted, with slight distal caliber increase. No other significant changes were observed.

*Parenchymal contrast-enhancing lesions are rare in LNB, which typically presents with meningeal or cranial nerve involvement [1]. Brainstem infarctions due to vasculitic LNB are rare but documented [2,3].*



Magnetic Resonance Imaging (MRI) of the brain with intravenous contrast agent (gadolinium-based) after 1 month

## Conclusions

This case illustrates a rare presentation of LNB with posterior circulation vasculitis and stroke, in the absence of systemic signs. Early diagnosis is crucial to achieving a favorable clinical outcome.

## References

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