

# Lyme Polyradiculitis with Leg Paresis and Paresthesia: Case Report of Neuroborreliosis

## Abstract

Lyme polyradiculitis is a rare cause of motor and sensory dysfunction. We present a case of a man with one month of worsening bilateral leg paresis, paresthesias and pain. He recalled no erythema migrans or tick bite. Initial screening showed negative serum Lyme and positive EBV testing. At our hospital, imaging revealed polyradiculitis with cauda equina nerve root enhancement. Subsequent serum and CSF testing was positive for Lyme serology. He improved rapidly from a course of doxycycline.

This case highlights the importance of timing for Lyme serologies in early neuroborreliosis, and converging clinical, imaging and biofluid testing for diagnosis and clinical management.

## Clinical Presentation

A man in his 60s with hyperlipidemia, rosacea and prior appendectomy and cholecystectomy presented in July for 1 month of worsening leg weakness, paresthesias, back pain, constipation and urinary retention.

Four weeks prior, he saw his primary care provider for new onset fatigue and mild lumbar back pain for a few days. He felt tired after mowing tall grass on his lawn and had **small, raised, erythematous rashes on his leg and abdomen**, which he attributed to flying insect bites. These self-resolved and were not target-shaped. Screening labs noted **high AST/ALT and EBV IgM+/IgG+**. He reported no pets, recent travel, arthralgias or tick bites; **Lyme serology was negative**.

Two weeks later, he presented to a hospital for abdominal pain. CT imaging of chest, abdomen and pelvis revealed distension of the bladder and colon without bowel obstruction or enlarged prostate. He had mild leukocytosis with unremarkable AST/ALT, urinalysis and electrocardiogram. He was discharged with NSAIDs.

He was admitted to our hospital after 1 week of **severe lumbago, leg weakness, gait unsteadiness and paresthesias of his thighs**. Bowel and bladder retention worsened. He was previously active, but now had difficulty standing without falling. He had **new-onset paroxysmal atrial fibrillation** up to 150 beats/minute that converted to sinus rhythm with intravenous metoprolol and did not recur.

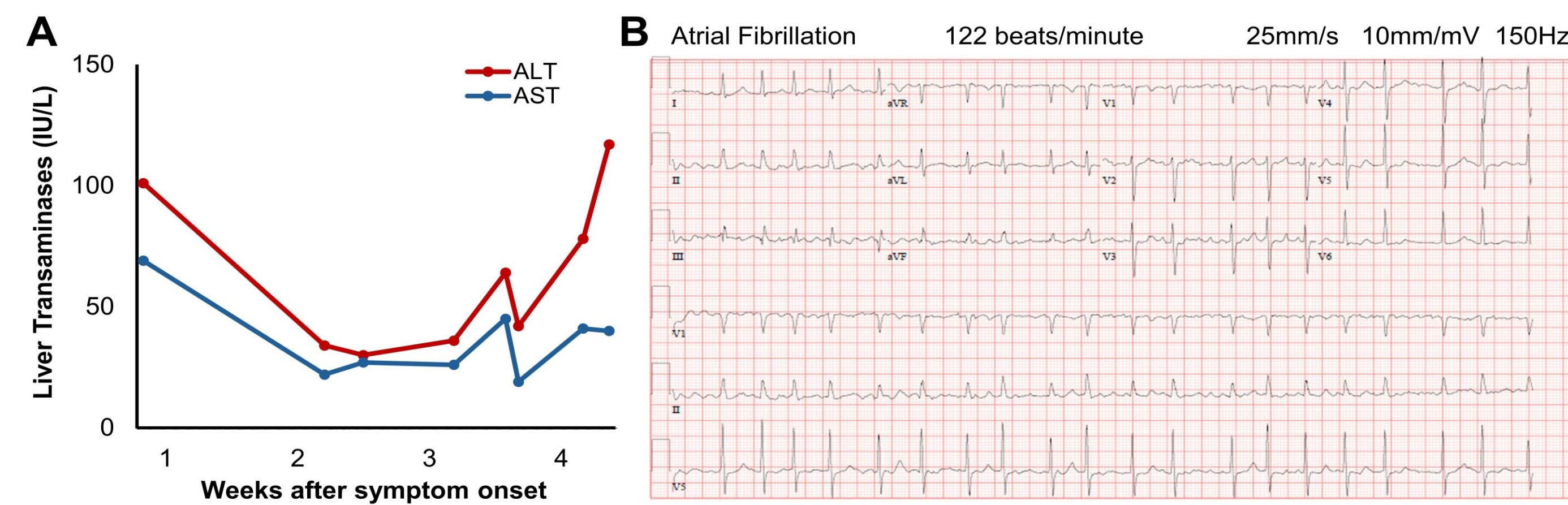
## Neurologic Exam

Notable for **weakness, sensory deficits and patchy hyporeflexia of proximal legs**.

- **Strength of bilateral hip flexors and extensors were 2/5**, knee flexors/extensors were 4/5 and foot dorsiflexors/plantarflexors were 5/5.
- **Medial and lateral thighs demonstrated decreased sensation to light touch, pinprick, temperature, vibration and proprioception**. Sensation in arms, lower legs and feet was intact.
- Patellar reflexes were 1+ bilaterally while ankle reflex was 1+ on left and 0 on right. Heal-to-shin maneuver was poor. No Babinski sign, Hoffmann sign or clonus.
- **Gait was unsteady and broad. Romberg sign was positive**. Arms were normal in strength and sensation. Cranial nerves were intact.

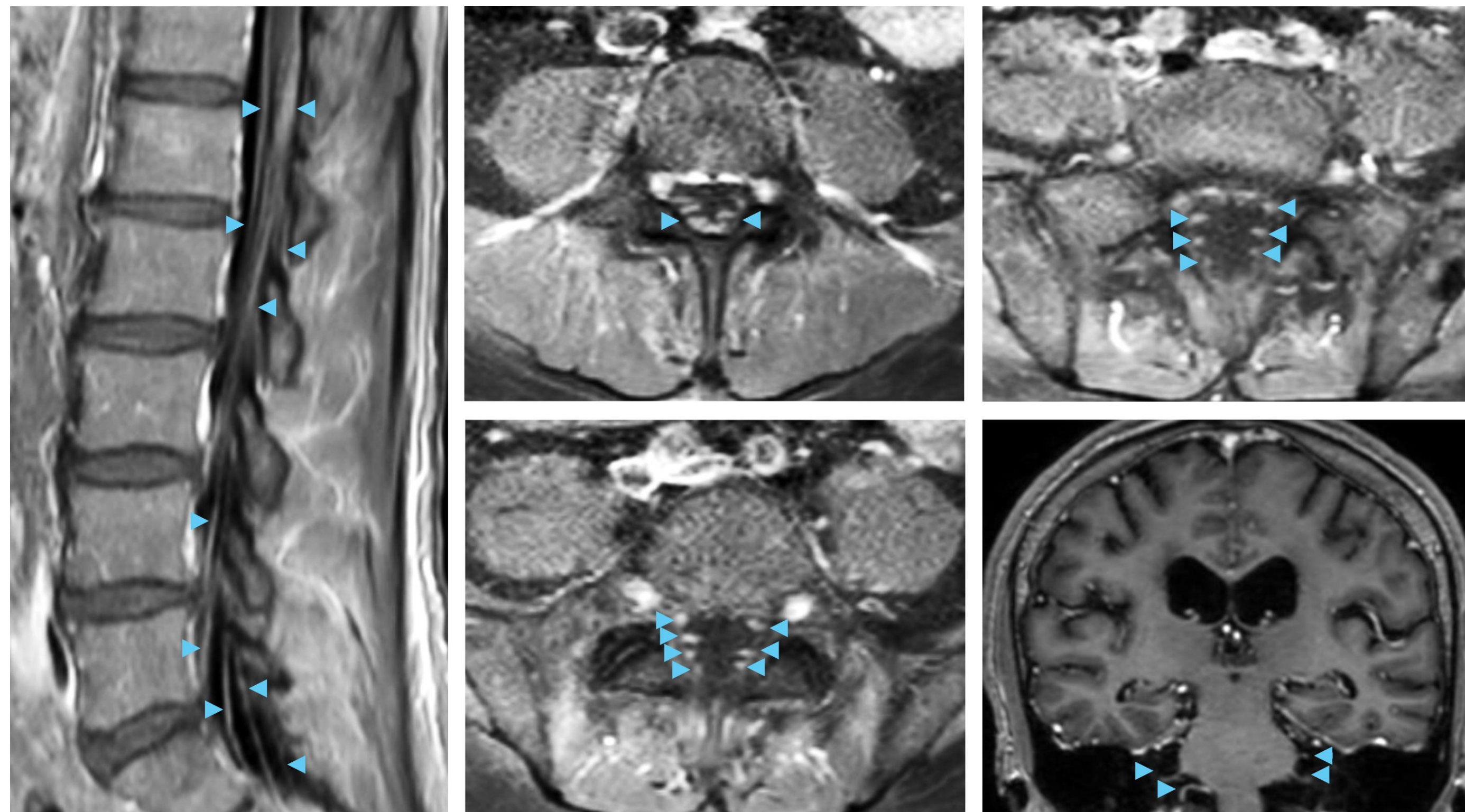
## Liver Injury and New-onset Atrial Fibrillation

**Elevated ALT** more than **AST** in this patient with normal baseline liver function. **New-onset atrial fibrillation** with heart rate from 120 to 150 beats/minute on ECG.



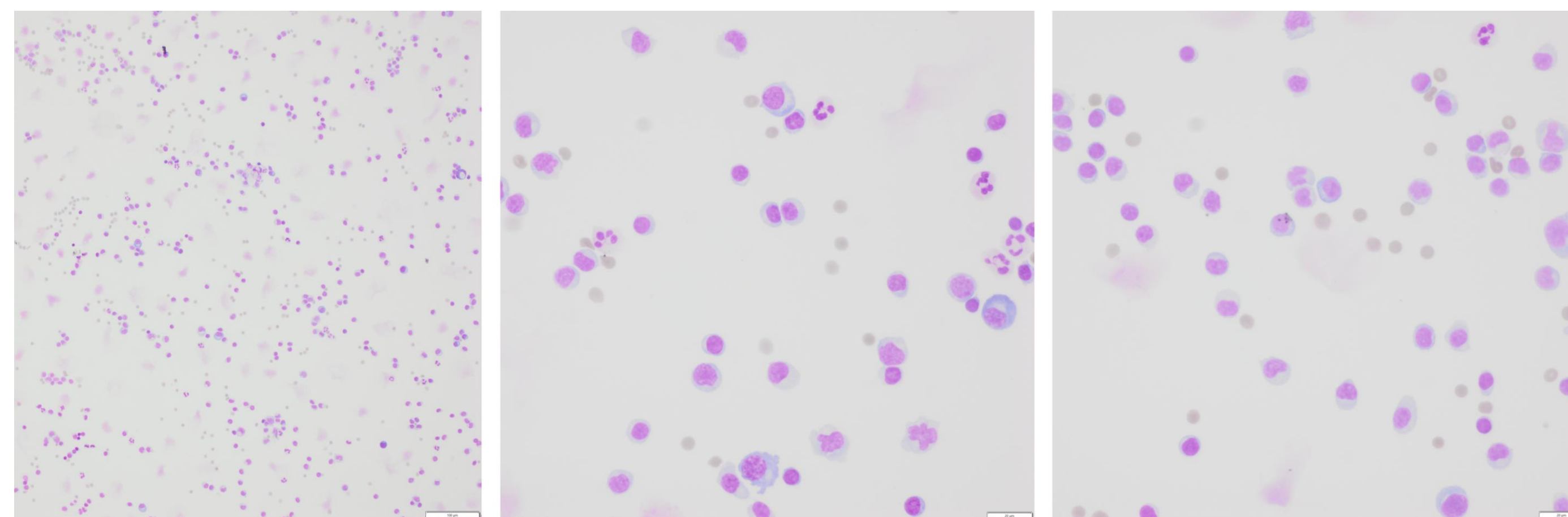
## Polyradiculitis on MRI Spine

Total spine MRI with enhancement of cauda equina nerve roots without abnormalities of the cord, vertebrae or neural foramina, indicating **lumbosacral polyradiculitis at levels L1 to L5**. Brain MRI suggested cranial nerve V enhancement.



## CSF Lymphocytic Pleocytosis

CSF testing showed **elevated protein** (147) and **pleocytosis** (114) with predominantly atypical polymorphous lymphocytes, plasma cells, and occasional neutrophils. CSF non-specific IgG was high and oligoclonal bands were reactive.



## Microbiological Studies

4 weeks prior to presentation

- Serum EBV IgM+/IgG+ and Lyme IgM-/IgG-

At presentation

- Serum negative for HIV, WNV, syphilis, *Anaplasma* and *Ehrlichia*
- Peripheral smear with no *Babesia* or *Malaria*
- CSF negative for WNV, HSV, VZV, HHV6, CMV, enterovirus and syphilis
- **Serum Lyme IgM+ (2/3 reactive bands)**
- **Serum Lyme with borderline IgG- (4/10 reactive bands, 5/10 is positive)**
- **CSF Lyme IgM+ and IgG+**

## Treatment Course

Differential diagnosis included polyradiculitis due to neuroborreliosis, neurosyphilis, flaviviruses and other tick-borne illnesses or atypical post-infectious acute inflammatory demyelinating polyradiculopathy (AIDP, Guillain-Barré spectrum). Before serologies resulted, empiric doxycycline and methylprednisolone were started.

**Doxycycline** 100mg was continued for a 21-day course. **Methylprednisolone** 250mg course was completed after 3 days. Lumbar pain, leg paresthesias and urinary retention were alleviated within 2 days. He regained strength to ambulate steadily. At a physical rehabilitation center 1 month after discharge, he reported improved ability to perform chores and walk around the house.

## Discussion

Initial Lyme screening at 1 week after exposure was negative. Repeat testing at 4 weeks was serum IgM+ and CSF IgM+/IgG+. EBV serology can be falsely positive in early disseminated Lyme due to epitope cross reactivity.

While cranial neuropathy is considered a common neurological presentation of Lyme disease, polyradiculitis is frequent, occurring in 75% of patients with CSF Lyme from some case series. Given our patient's bilateral paresis, paresthesias, hyporeflexia and dysautonomia, Lyme polyradiculitis can mimic AIDP, as both lead to nerve root enhancement on MRI, though clinical exam differentiates the two. AIDP has leg areflexia with CSF albuminocytologic dissociation, while Lyme can have patchy hyporeflexia with dually elevated CSF protein and WBCs.

Patients with Lyme disease can present with mild-moderate liver injury; ALT is often higher than AST. Disseminated Lyme can cause carditis leading to arrhythmia. Our patient had new-onset paroxysmal atrial fibrillation without heart block.

## Conclusions

Overall, Lyme polyradiculitis from neuroborreliosis can be considered in patients with leg weakness, paresthesia and elevated transaminases, including in those without a classic rash or initial Lyme serology.