When Milestones Reverse

MRI Findings of Metachromatic Leukodystrophy

A suspected late-infantile presentation

50th Annual Southeastern Neuroradiological Society Meeting

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Clinical presentation

28-MONTH-OLD BOY

Motor skills regress

Progressive spasticity

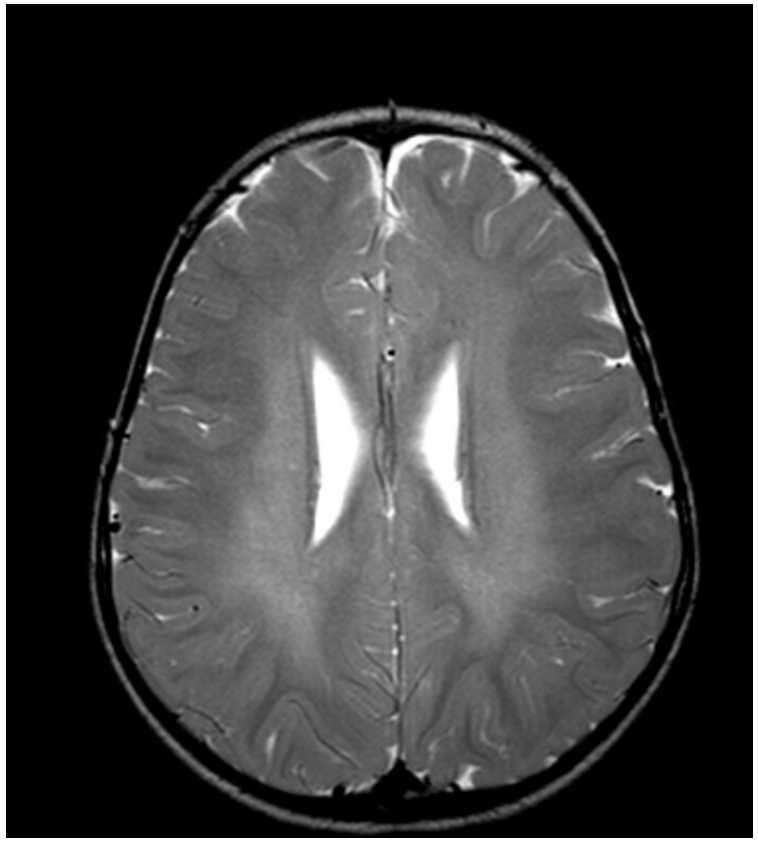
PRESENTING FINDINGS

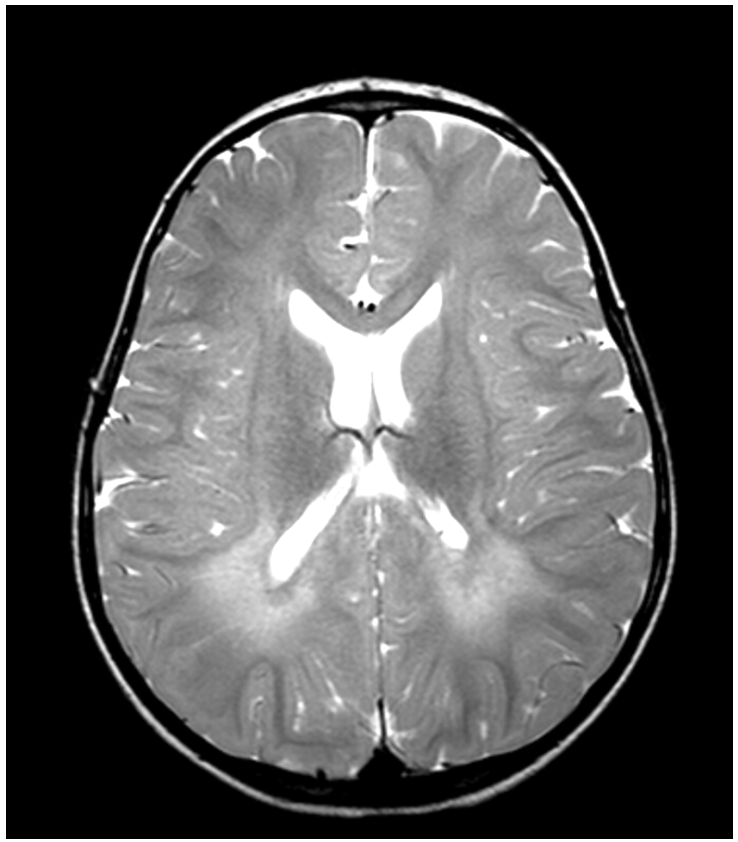
Loss of previously acquired motor skills
Upper motor neuron findings
Familial history of MLD

PRESERVED AT PRESENTATION

Speech and social interaction
No reported visual symptoms

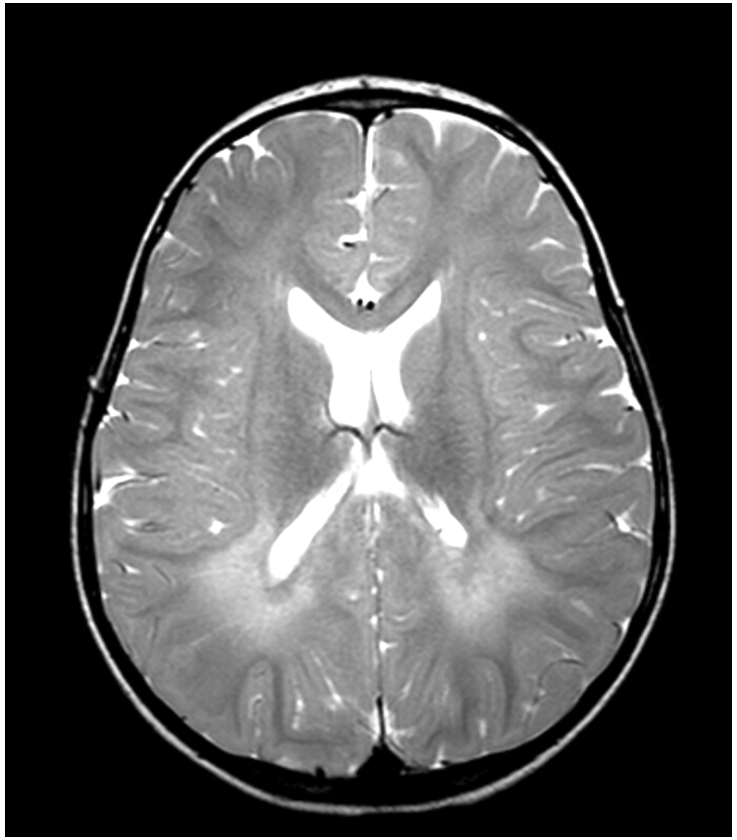
MRI overview: symmetric white matter disease





Axial T2/FLAIR-type images: confluent periventricular and deep white matter hyperintensity.

Relative subcortical U-fiber sparing



DISTRIBUTION

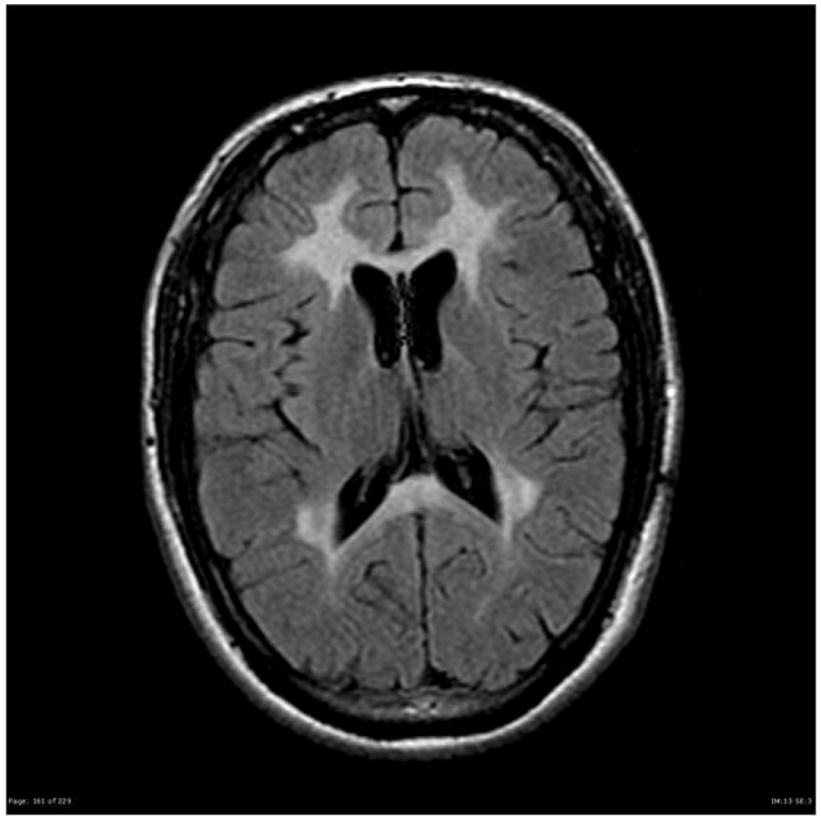
Deep white matter involvement

Relatively preserved superficial white matter

Symmetric pattern

The deep-to-superficial distribution helps narrow the leukodystrophy differential.

Corpus callosum involvement



POSTERIOR WHITE MATTER

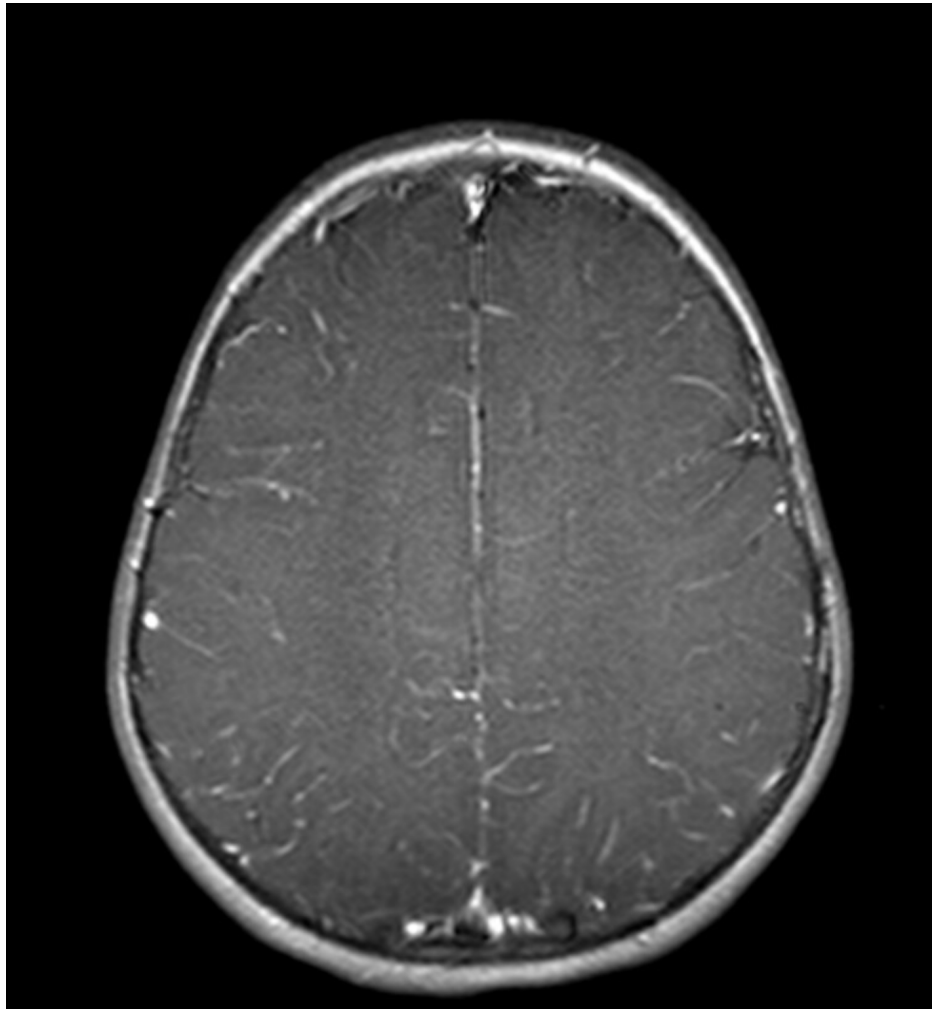
Periventricular signal abnormality

Splenial involvement

Relative U-fiber sparing

Callosal involvement supports the pattern, but MRI alone does not confirm MLD.

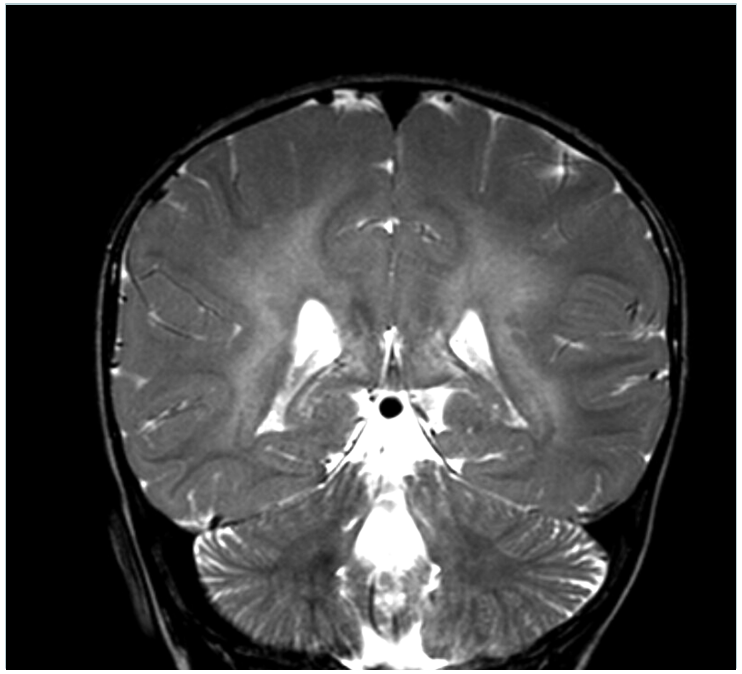
Enhancement

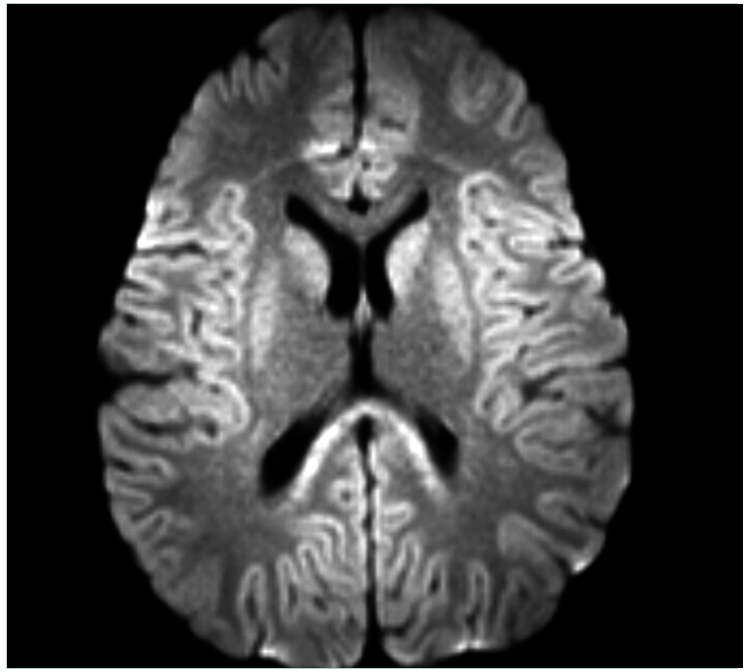


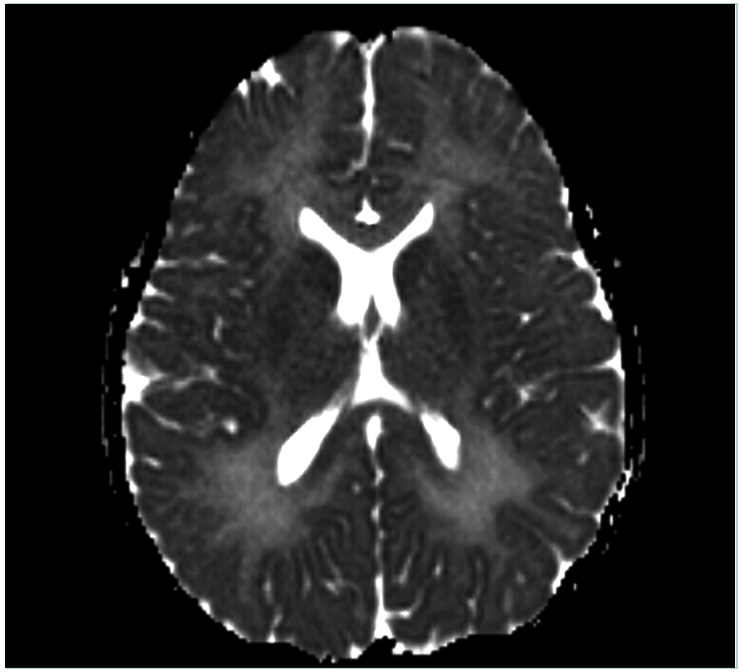
POSTCONTRAST T1

No abnormal enhancement reported

Additional MRI views to complete the case







Imaging differential

Diagnosis	Useful imaging clues
Metachromatic leukodystrophy	Symmetric deep white matter disease, early U-fiber sparing, callosal involvement
Krabbe disease	Tract / brainstem involvement, thalamic abnormalities, optic pathway enlargement
Cerebral X-linked ALD	Often posterior callosal disease with an enhancing active margin
Acquired white matter disease	Distribution and clinical time course may be atypical for inherited disease

Motor regression plus this MRI pattern favors MLD, with biochemical / genetic correlation.

Diagnostic confirmation

TESTING TO DOCUMENT

Arylsulfatase A enzyme activity

Urinary sulfatides

Molecular testing for ARSA variants

CASE INFORMATION STILL NEEDED

Actual enzyme result

Sulfatide result

Genetic findings and confirmation date

Low ARSA activity alone can reflect pseudodeficiency. Confirmatory results are not supplied.

Treatment window and referral

FDA-APPROVED GENE THERAPY

Atidarsagene autotemcel (Lenmeldy)

Presymptomatic late-infantile MLD
Presymptomatic early juvenile MLD
Early symptomatic early juvenile MLD

THIS PRESENTATION

A symptomatic suspected late-infantile case requires specialist assessment.

Refer promptly to neurology, genetics, and a leukodystrophy treatment center.

The FDA indication does not include symptomatic late-infantile MLD.

Reported clinical course

REPORTED OUTCOME

Progressive neurologic decline

Seizures worsened

Symptom-directed supportive care

SUPPORT AND FAMILY CARE

Spasticity and seizure management

Feeding, mobility, and comfort needs

Genetic counseling and evaluation of at-risk siblings

Obtain the clinical timeline and treatment assessment to connect MRI findings with outcome.

Take-home points

1 **Motor regression is a diagnostic clue**

Loss of acquired skills warrants evaluation for progressive white matter disease.

2 **Distribution matters**

Symmetric deep white matter disease, relative U-fiber sparing, and callosal involvement suggest MLD.

3 **Recognition should prompt action**

Confirm biochemically / genetically and refer early. Treatment eligibility depends on subtype and stage.

References
1. Groeschel S, Kehrer C, Engel C, et al. Metachromatic leukodystrophy: natural course of cerebral MRI changes in relation to clinical course. J Inherit Metab Dis. 2011 Oct;34(5):1095-102.
2. Metachromatic Leukodystrophy. Radiopaedia.org. radiopaedia.org/articles/metachromatic-leukodystrophy