• 35-year-old woman with progressive difficulty walking and using her left hand since age 14
• Progressive vision loss and ophthalmoparesis since age 8
• Examination: macrocephaly, absent ocular pursuits, left arm and leg dystonia, spastic ataxic gait
• Progressive vision loss was attributed to retinitis pigmentosa (RP) (Fig. 1)
• Initial MRI: right frontal lobe mass, porencephalic cyst
• Mass and cyst were resected at age 9, with a rendered diagnosis of pilocytic astrocytoma (PA), WHO grade I
• Serial surveillance MR imaging showed variable enhancement in the left middle cerebellar peduncle, hypothalamus and thalamus (Fig. 2, Image A)
• Diagnosis was changed to Alexander disease (AD) after re-examination of pathology, which showed profuse Rosenthal fibers and Rosenthal fiber-like granular inclusions in astrocytic cell bodies, characteristic of AD and not a feature of PA (Fig. 3)
• Alexander disease is an autosomal dominant progressive leukodystrophy caused by mutation in the glial fibrillary acidic protein (GFAP) gene
• Three clinical variants: infantile, juvenile and adult onset

Background
Hemidystonia Associated with Alexander Disease
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Imaging Findings

Figure 2. A: Left middle cerebellar peduncle lesion (arrow); B: Porencephaly, post-resection of right frontal mass

Pathology
• In addition to AD, Rosenthal fiber formation can be seen in pilocytic astrocytoma, ganglioglioma and pleomorphic xanthoastrocytoma
• Cytologically atypical astrocytes, a recognized feature of AD, could contribute to misdiagnosis as brain tumor
• This diagnostic pitfall can be avoided by awareness of one distinctive histologic feature of AD - the presence of Rosenthal fiber-like eosinophilic cytoplasmic inclusions in astrocyte cell bodies, which is not typically seen in other mimicking conditions

Movement Disorder
• Ataxia and palatal myoclonus are the two most frequent movement disorders in patients with AD (typically late onset)
• Ataxia is present in about 46% of juvenile AD, and in 82% of adult onset AD
• Palatal myoclonus is present in about 34% of adult onset AD, 2% of juvenile AD, and almost never seen in infantile variant
• “Extrapyramidal symptoms,” “rigidity,” “spasticity” and “unsteady gait” have been previously described, but this is the first case of AD associated with dystonia
• Although left hemidystonia in our patient is probably due to the right frontal porencephalic cyst, cystic degeneration and basal ganglia lesions are frequently found in patients with AD

Selected References