

## Megalencephalic leukoencephalopathy with subcortical cysts in an adult

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A 22 year old man presented with episodes of generalized tonic clonic seizures since 5 years of age, declining scholastic performance and progressive difficulty in walking since 8 years of age. He was born as the second of twins of non-consanguinous parentage. The other twin, a female had a similar illness and succumbed to it by 20 years of age. Both were born at term. Their early developmental sequences were normal except for megalencephaly, which was noticed around 2 years of age.

They belonged to the Agarwal family, which is an ethnic community in India. On examination, his higher mental function showed an MMSE score of 21 and impaired frontal lobe functions. Saccadic eye movements were slow. He had bipyramidal and bilateral cerebellar signs. Rest of his neurological and systemic examination was normal.

An MRI scan of the brain showed bilateral symmetric diffuse long-TR hyperintensity involving the subcortical white matter, centrum semiovale, periventricular white matter, cerebellar white matter, and middle cerebellar peduncles. On T1W sequence, these areas were hypointense. No periventricular enhancement was noted. Large, oval, well-defined subcortical cysts of CSF signal intensity were noted in both anterior temporal lobes. Diffuse mild cortical atrophy was present. On MRS, mild reduction in NAA to creatine and choline to creatine ratio was noted in the abnormal white matter as compared to uninvolved white matter in the same patient (Fig. 1).

The clinical presentation and MRI features are diagnostic of Megalencephalic leukoencephalopathy with subcortical cysts (MLC).

MLC presents a clinical evolution milder than other forms of leukodystrophies and was first described by van der Knaap *et al.* (1995). The first abnormality noted is macrocephaly with onset during the first year of life, after which the skull growth stabilizes. After years of near normal development, slow motor and later mental deterioration

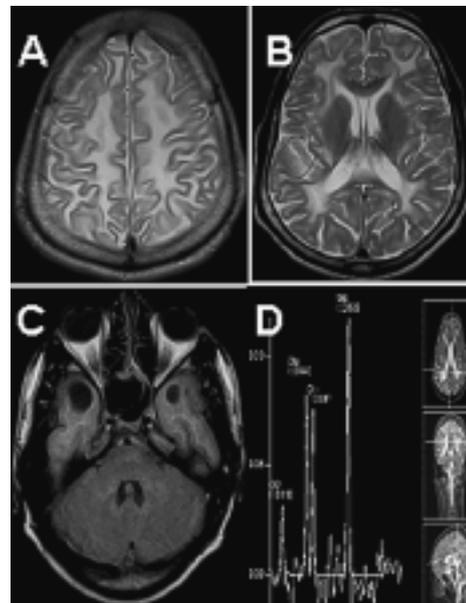


FIG. 1. — T2 W axial sequence showing bilateral symmetric diffuse hyperintensity involving the subcortical white matter and centrum semiovale (A), periventricular white matter with sparing of the basal ganglia and internal capsule (B), large, oval, well-defined subcortical cysts in both anterior temporal lobes in the FLAIR sequence (C), MRS from abnormal white matter showing mild reduction in NAA to creatine and choline to creatine (D) as compared to normal white matter (not shown).

become evident. Seizures, ataxia and spasticity are characteristic (Krishnan *et al.*, 2005). MLC is a rare disease with a low carrier rate. It has a high incidence in populations in which consanguinity is common. Parental consanguinity and disease in siblings suggest an autosomal recessive inheritance. The gene locus has been assigned to chromosome 22q<sub>tel</sub> and mutations in a gene renamed MLC1 have been identified as the cause (Patrona *et al.*, 2003). In India, the majority of patients belong to the Agarwal community (Sethi & Sethi 2004). Swelling of white matter on MRI is seen in children. This is later replaced by

enlargement of CSF spaces. Our patient, being 22 years old had reached the stage of mild brain atrophy due to long standing axonal damage. This finding is similar to the case described by Brockmann *et al.* (2003). All attempts to treat MLC have failed. Anticonvulsant therapy and physical therapy are the mainstay of treatment. Pre-natal diagnosis is possible by amniocentesis or chorionic villous sampling (Patrona *et al.*, 2003). The specific findings in MRI along with the clinical presentation are diagnostic of this condition. The MRI appearance in an adult is slightly different from that in a child and has been less commonly described in literature.

#### REFERENCES

- VAN DER KNAAP M. S., BARTH P. G., STROINK H., NIEUWENHUIZEN O. V., ARTS W. F., HOOGENRAAD F. *et al.* Leukoencephalopathy with swelling and a discrepantly mild clinical course in eight children. *Ann. Neurol.*, 1995, **37** : 324-334.
- KRISHNAN K. H., PAULINE C. L., KUMARESAN G., MALLIKAN T. K. Megalencephalic Leukoencephalopathy with Subcortical Cysts. *Indian Paediatrics*, 2005, **42** : 60-63.
- PATRONA C., DI GIACINTO G., EYMARD-PIERRE E., SANTORELLI F. M., RODRIGUEZ D., DE STEFANO N. *et al.* Genetic heterogeneity of megalencephalic leukoencephalopathy and subcortical cysts. *Neurology*, 2003, **61** : 534-537.
- SETHI P. K., SETHI N. K. Megalencephalic leukoencephalopathy with subcortical cysts. *The Indian Journal of Paediatrics*, 2004, **71** : 473-475.
- BROCKMANN K., FINSTERBUSCH J., TERWEY B., FRAHM J., HANEFELD F. Megalencephalic leukoencephalopathy with subcortical cysts in an adult : quantitative proton MR spectroscopy and diffusion tensor MRI. *Neuroradiology*, 2003, **45** : 137-142.

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