

CASE REPORT: MITOCHONDRIAL ENCEPHALOMYOPATHY WITH ACIDOSIS AND STROKE-LIKE EPISODES IN A VIETNAMESE CHILD



CLINICAL, RADIOLOGICAL AND MOLECULAR GENETIC ANALYSIS.

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Mitochondrial encephalomyopathy, lactic acidosis and stroke-like episodes (MELAS) is a mitochondrial multisystem disorder. This disease has mainly been associated to the mitochondrial DNA mutation A3243G located in the tRNA leucine gene. We report the clinical, radiological and molecular results of a 7 year-old child with the classical mitochondrial encephalomyopathy, lactic acidosis and stroke-like episodes phenotype.

1. CASE REPORT

A 7 year-old girl presented with a focal seizure in the left side associated with bouts of vomiting. She had a history of hirsutism, recurrent episodes of nausea and vomiting, focal seizure in the right side last year.

Neurological examination revealed generalized muscle weakness with mild right-sided hemiparesis, slow perception and vision loss. Electroencephalography showed a right hemisphere epilepsy with secondary generalization.

Laboratory investigations was notable for an elevated lactate level in cerebrospinal fluid (8.5 mmol/l) and serum (6.2 mmol/l).

The MRI revealed signal abnormalities at the temporal and occipital lobe in both sides. The largest lesion was 105 x 60 mm in the right side, pushing the midline to the left # 7mm, suggesting the possibility of acute right side and chronic left side cerebral infarction.

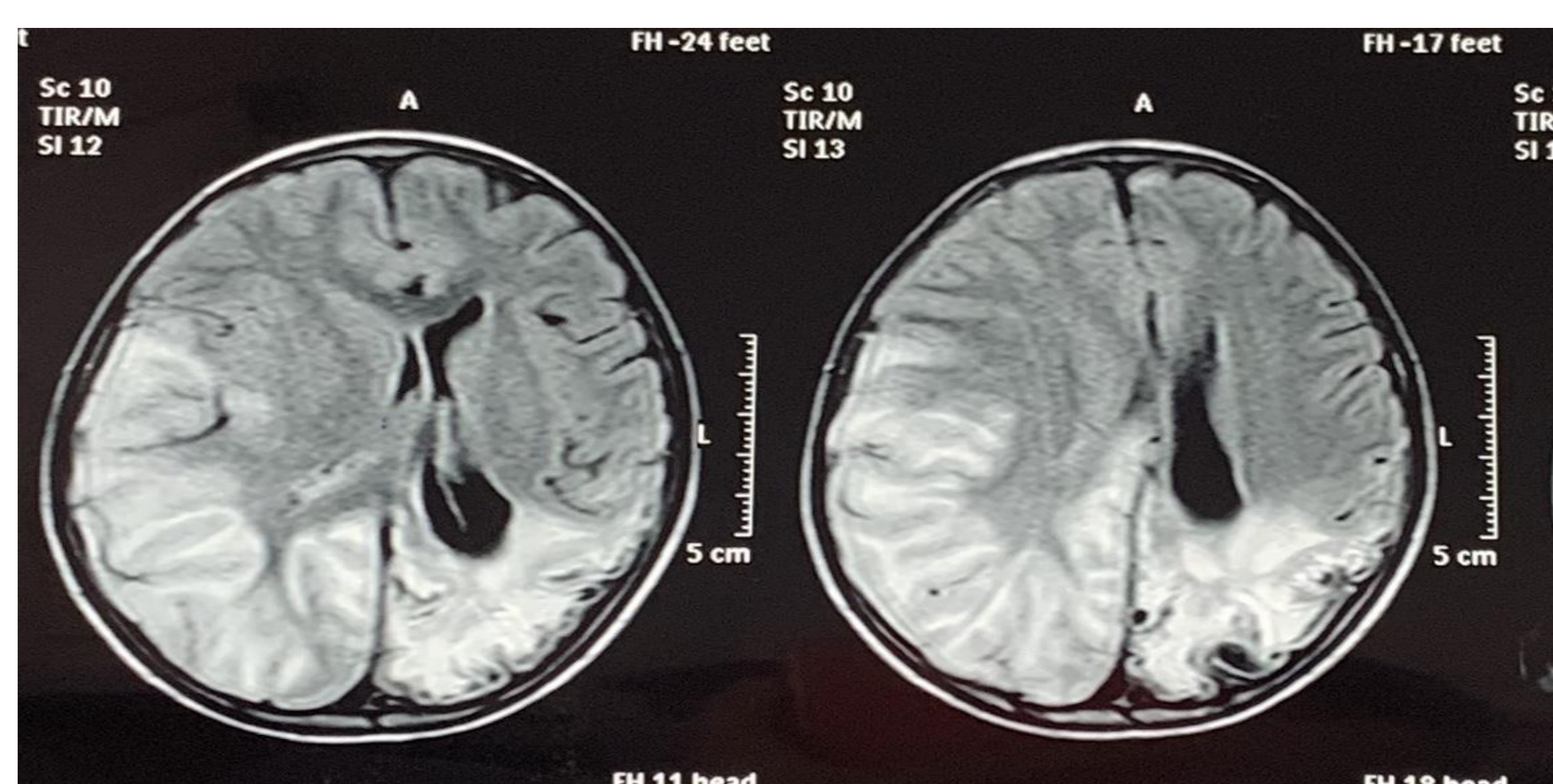


Figure 1. MRI showing infraction of the temporal and occipital lobe in both sides.

The mitochondrial DNA mutations m.3200-m.4340, m.11760-m.12500, m.13300-m.1400 were tested using Polymerase Chain Reaction- Restriction Fragment Length Polymorphism analysis and direct sequencing in the system of ABI 3500 Genetic Analyzer. The m.3243A>G mutation was detected in the blood of the patient.

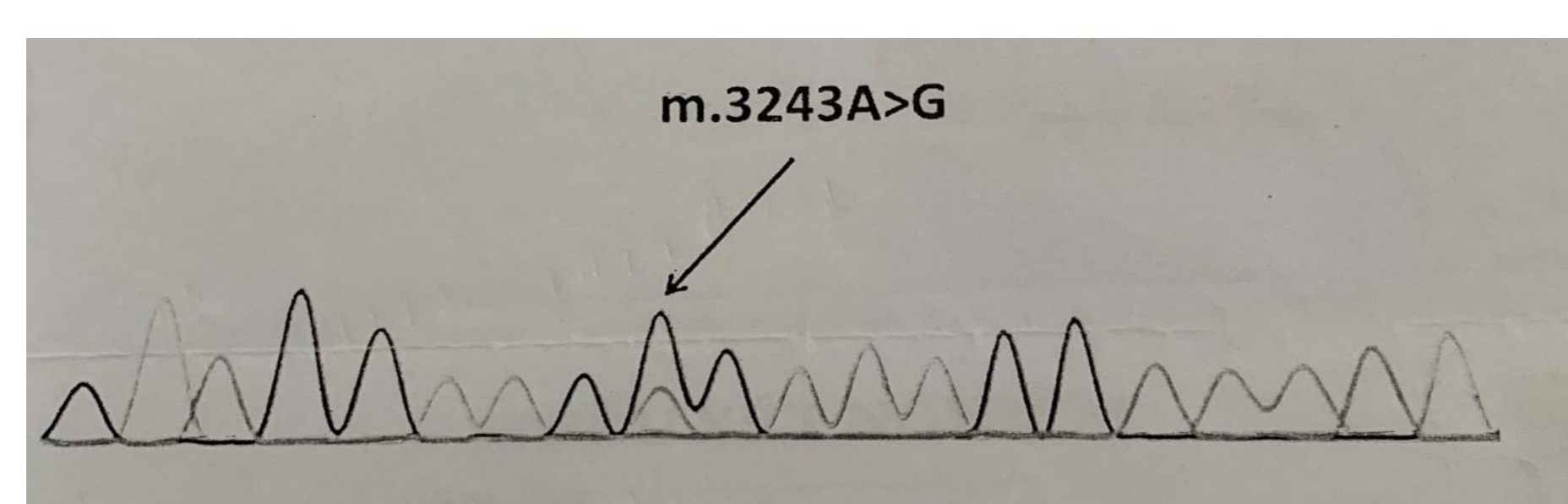


Figure 2. A3243G mutation confirmed by direct sequencing.

Treatment options for MELAS are limited and largely focus on supportive therapy. The patient was treated with L-carnitine 100 mg/kg/day, coenzyme Q10, cocktail vitamin supplements and optimised carbamazepine dosing. She underwent ophthalmological and cardiac evaluation to assess for multisystem involvement.

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2. DISSCUSION

A diagnosis of MELAS is based on clinical features, including recurrent stroke like episodes preceded by vomiting and headache, MRI abnormalities of infarct like lesions that are not confined to the major vascular territories and biochemical evidence for mitochondrial defects, such as lactic acidosis.

The proband of this case report expressed the classical picture of MELAS syndrome:

-MELAS usually affects patients by the age of 5–15 years. In concordance with this case, the proband started to manifest by the age of 7 years.

-The high level of lactate in plasma and *cerebrospinal fluid* in the proband was in agreement with the fact that high lactate is a marker of MELAS. In MELAS, lactic acidosis correlates with the severity of neurological impairment.

-Cerebral imaging plays a central role in further diagnostics relating to suspected or certain MELAS syndrome in children. Concomitant with these findings, the slow perception was due to the acute infarction of the right posterior cerebral artery. Visual loss was due to bilateral lobe injury from two episodes of posterior cerebral artery infarction. Local left seizure consistent with right hemispheric cortical lesions. The MRI of the proband showed infarct like lesions of the temporal and occipital regions in both side.

-At least 30 kinds of gene mutations had been reported in MELAS patients. The A3243G mutation is found in 80% of the patients. In this case, the proband were positive for the m.3243A>G mutation confirming the theory of maternal inheritance of MELAS.

-Many treatment options had been recently reviewed. L-carnitine was reported to be one of the promising therapeutic options for MELAS patients. Accordingly a preventive treatment was given to proband described in this case in the form of L-carnitine 100 mg/kg/day. Metabolic therapies have been used to increase the production of ATP. Coenzyme Q10, ascorbate, riboflavin, and vitamins K-1 and K-3 have proven quite successful.

3. CONCLUSION

MELAS syndrome is one of the most common clinical entities caused by mitochondrial tDNA mutations. Our case expressed the classical picture of MELAS syndrome was highlighting the role of discovery as soon as possible to prevent treatment delay . In the long term, both the patient and family members should receive genetic counselling, and the family should be educated about further deterioration and possible complications.