

# CADASIL (Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy) in a young adult with migraine

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## Case Presentation

A 44-year-old female presented to our practice with the complaints of sudden onset of severe headache and migraine associated with visual aura, dizziness and foggy in her head. This was her first episode of the kind and she could only see through half of her vision. She was having daily headaches and migraine in the lead up to this episode.

Past medical history included depression, migraine and rosacea. She was medicated with citalopram 20 mg daily for treatment of depression and was on minocycline 50 mg twice daily for rosacea.

On physical examination she had malar rash, her visual acuity was normal with no evidence of papilloedema or vascular changes. Extra ocular movements were normal. The rest of the cranial nerves' examination were normal. Upper and lower limb examinations were normal. A gait examination did not reveal any abnormality. Cognitive assessment was unremarkable.

As part of the initial assessment and due to suspicion of a possible intracranial pathology a CT brain scan was performed, showing patchy low-density regions throughout the white matter and a recommendation was made for an MRI scan for a detailed assessment. The patient was referred to a neurologist and subsequent investigation with MRI revealed

extensive bilateral periventricular and deep white matter hyper intensity throughout the cerebral hemispheres as well as anteromedial aspects of the anterior temporal poles bilaterally, favouring CADASIL. Differentials considered were, Systemic Lupus Erythematosus (SLE), CADASIL and Fabry disease. Further investigations included serum autoantibodies, inflammatory markers, spinal fluid analysis and thrombophilia screen which returned normal results. For confirmation of diagnosis of CADASIL patient was referred for skin biopsy by a dermatologist. A confirmed diagnosis of CADASIL was made by presence of osmophilic granular deposits in the arterioles. Investigation for Fabry disease was deferred.

Corroborative history was taken from family members. Patient's mother suffered from migraine and was under care of a neurologist. Patient's father had long standing history of epilepsy, since the age 18. No other relevant history of note. Both parents were alive, both were in their late sixties and none were diagnosed with CADASIL.

The patient declined genetic testing and following skin biopsy, declined genetic counselling initially due to fear of implications it held for her three young children. After further discussions with empathetic approach, the family decided to have genetic counselling.

## Discussion

Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL) is a hereditary vascular disease the onset of which can be early causing multiple asymptomatic strokes and commonly accompanied by migraine, psychiatric symptoms i.e. depression and progressively severe neurological deficits over a period of time (1). MRI of the brain can be an important tool to aid diagnosis. A pathognomonic feature of the condition is typical involvement of the temporal lobes and external capsule. MRI changes have been detected in younger adults even below the age of 35 (2,3,4). Most affected individuals with CADASIL will have an affected parent. Nevertheless no apparent family history of CADASIL should not preclude the diagnosis, for example, the case mentioned above (5,6). A conclusive diagnosis of the condition requires genetic testing detecting mutation in NOTCH 3 gene or electron microscopy of skin biopsy specimens showing osmophilic granular deposits in the arterioles (7). However, a significant proportion of genetic testing for CADASIL may yield false negative results. If there is strong suspicion for the disease, a skin biopsy should be considered (7).

## Conclusion

The case of CADASIL reported, in addition to the typical MRI findings, was confirmed by presence of granular deposits in the arterioles, from skin biopsy. The patient's presentation with worsening migraine and aura were consistent with those mentioned in literature. Important information not to be missed here was the history of depression, which is also well recognised, evident from the studies. The patients' refusal to have genetic testing and later declining genetic counselling indicates how the affected individuals are confronted with such a predicament in the diagnostic process and management planning.

## Important learning points

1. CADASIL should be considered a possible cause in patients with migraine and aura associated with psychiatric disorder i.e. depression
2. A lack of apparent family history should not preclude the diagnosis of CADASIL.
3. Diagnosis of affected patients will allow family members to seek genetic counselling, but one has to be mindful of the predicament of the affected individual which may hinder management.
4. MRI scan of the brain can be an important diagnostic aid.

**Ethical concerns:** Consent for case presentation taken from patient.

**Conflict of interest:** None

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