CASE REPORT

Familial Fahr's Disease Presenting with Parkinsonism in a Young Male

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ABSTRACT

Fahr's syndrome is a rare idiopathic neurodegenerative disorder which can present with wide spectrum of symptoms. It is characterized by bilateral symmetrical dystrophic intracranial calcification. It most commonly involves basal ganglia. A 30 years old male patient presented with progressive speech slurring and tremors of the right upper limb for last five years. His brain imaging studies revealed findings of extensive dystrophic calcification. He had an elder sister who had progressive limb weakness, tremors and speech slurring. Her brain imaging studies also showed same findings. On the basis of family history, neuroimaging findings and laboratory investigations, patient was diagnosed with the case of familial Fahr's disease. Fahr's disease should be considered as an important differential diagnosis in cases of Parkinsonism refractory to the treatment.

Key Words: *Neurodegenerative disorder. Calcification. Basal ganglia. Parkinsonism. Striopallidodentate calcinosis. Fahr's disease.*

INTRODUCTION

Idiopathic basal ganglia calcification, also known as Fahr's disease or Fahr's syndrome or bilateral striopallido-dentate calcinosis, is a rare inherited neurodegenerative disease that is characterized by the bilaterally symmetric deposition of calcium (and other minerals) in the basal ganglia, thalamus, dentate nuclei, and centrum semiovale in the absence of any metabolic abnormality including hypoparathyroidism. Patients present with a slow onset of non-specific symptoms such as headache, vertigo, movement disorders, syncope, and seizures, paresis, spasticity, gait disturbance, speech disorders, parkinsonism, chorea, and orthostatic hypotension.

To authors' knowledge, only two cases of Farh's disease has been reported in local journals. Earliest reported was a case of basal ganglia calcification, seen quite commonly as an incidental finding.[1,2]

We present a case of extensive familial form of Fahr's disease in a male who presented with progressive parkinsonism and dysarthria commencing at the age of 25 years.

CASE REPORT

A 30 years old male presented with gradual onset of progressive involuntary tremors of right hand and slurring of speech for five years. Neurological examination revealed dysarthria and pill rolling tremors of the right hand labelled as Parkinsonism. He had been visiting local physicians and neurosurgeons but his symptoms kept on worsening gradually. The patient is the youngest amongst his three siblings. His elder sister married with two children, also had similar episodes of gradual onset progressive extrapyramidal symptoms since 28 years of age, leaving her bed ridden for past few months. Family history also revealed consanguineous marriage of the parents (first maternal cousins). On examination, he had slurred speech and occasional involuntary tremors of both upper limbs.

Computed tomography of brain of the patient revealed bilateral symmetrical calcification of basal ganglia (Figure 1a), thalami, cerebellum (Figure 1b) and subcortical white matter. MRI also confirmed extensive dystrophic calcification without any enhancement on post-contrast images (Figure 2). His ultrasound abdomen showed cholelithiasis. Serum calcium, phosphorus, iron, copper and magnesium were normal. Assay for parathyroid hormone and thyroid function tests were normal. Blood complete picture, liver function tests and serum urea creatinine were also within normal limits. Computed tomography of brain of his sister also showed bilateral symmetrical calcification of basal ganglia, thalami, subcortical white matter and cerebellum. The final conclusion of Fahr's disease was made on the basis of history, familial association of the disease and exclusion of normal metabolic disorders like Wilson's disease and parathyroid hormones related disorders. Patient and family counselling was done.

DISCUSSION

Fahr's disease is a rare degenerative neurological disorder characterized by the presence of abnormal

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Received: March 12, 2012; Accepted: August 31, 2013.

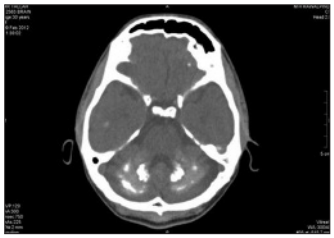

Figure 1a: Axial CT slice showing calcification of dentate nuclei and cerebellar white matter.

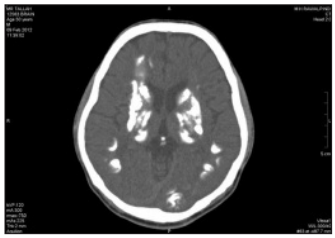

Figure 1b: Axial CT slice showing calcification of basal ganglia and subcortical white matter.

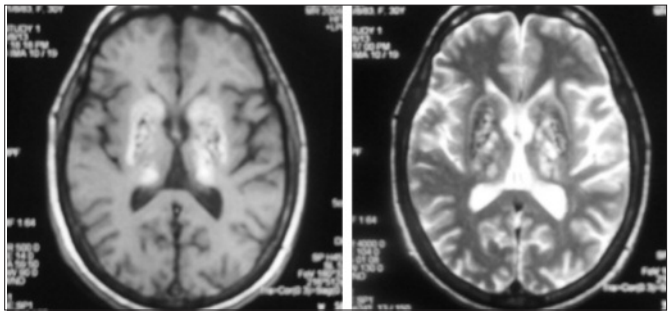

Figure 2: Axial T1WI and T2WI showing calcification of basal ganglia as signal.

calcium deposition and associated cell loss in the areas of the brain that control movement, including basal ganglia and cerebral cortex.[3] The disease was first noted by the German neurologist Karl Theodor Fahr in 1930.[4] The disease is also referred to as 'bilateral striopallido-dentate calcinosis,' or 'idiopathic non-arteriosclerotic intracerebral calcifications.'

Fahr's disease is often familial transmitted as an autosomal dominant inheritance or autosomal recessive trait. Calcium deposition is thought to be due to a disorder of neuronal calcium metabolism, associated with defective iron transport and free radicals that result in tissue damage and dystrophic calcification. The age at onset of clinical symptoms is 30 - 50 years. The patient usually presents with Parkinsonism, choreoathetosis, and cerebellar ataxia, pyramidal signs, psychiatric symptoms, and urinary incontinence. On neuroimaging, the condition is characterized by bilaterally symmetric dense calcifications in the basal ganglia, dentate nuclei, thalamus, and subcortical white matter of the cerebrum. Previously CT provided a better diagnostic specificity for cerebral calcification than MR imaging, but studies have shown that susceptibility-weighted MR imaging may be more sensitive for early changes.[5] Although magnetic resonance (MR) imaging is the modality of choice for evaluation, the correct diagnosis can be made only by taking all relevant clinical and laboratory information into account. Usually, calcium are hyperintense on T1W MRI images whereas, varying signal intensities of calcified lesions detected on MRI are related to stage of disease and the volume of calcium deposit. Additionally, no contrast enhancement is found in these areas.[6] Radiologists may detect bilateral abnormalities of the basal ganglia and thalamus in different acute and chronic clinical situations. The neuroimaging diagnosis is also influenced by detection of abnormalities involving other parts of the brain, especially the cerebral cortex, brainstem, and white matter. Judicious use of confirmatory neuroimaging investigations of these abnormalities and help narrow the differential diagnosis.[7] Important alternatives in the radiologic differential diagnosis for Fahr's disease include hypoparathyroidism or pseudohypoparathyroidism (end-organ resistance to parathyroid hormone), which can be confirmed with measurements of serum calcium, phosphorus, and parathyroid hormone levels. Pseudohypoparathyroidism, in which there is no abnormality of calcium metabolism in asymptomatic patients, is another possible diagnosis in patients with widespread cerebral calcification.[7] The important differential diagnosis of basal ganglia calcification of familial nature are, Fahr's syndrome (familial idiopathic symmetrical basal ganglia calcification), Cockayne's syndrome, tuberosclerosis, and familial degenerative disorders. There is no cure for Fahr's syndrome, nor is there a standard course of treatment.[8] Treatment addresses symptoms on an individual basis. Case reports have suggested that haloperidol or lithium carbonate may help with psychotic symptoms.[9] The prognosis for any individual with Fahr's syndrome is variable and hard to predict. There is no reliable correlation between age, extent of calcium deposits in the brain, and neurological deficit. Since the appearance of calcification is age-dependent, a CT scan could be negative in a gene carrier who is younger than the age of 55. Progressive neurological deterioration generally results in disability and death.

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