

FAHR DISEASE WITH BILATERAL VISUAL IMPAIRMENT

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ABSTRACT

Fahr disease is a rare neurodegenerative disease characterized by abnormal calcium deposition in the basal ganglia and cerebral cortex. The disease usually presents with alterations of memory, cognitive functions, movement disorders and psychiatric disorders, without reporting in the literature of visual impairment to date. We present the case of a patient with Fahr disease with bilateral visual impairment associated with cortical calcifications in the occipital lobe.

Keywords: Fahr disease; Fahr's syndrome; Visual impairment; Basal ganglia calcification; Case report.

DOENÇA DE FAHR COM COMPROMETIMENTO VISUAL BILATERAL

RESUMO

A doença de Fahr é uma doença neurodegenerativa rara caracterizada pelo depósito anormal de cálcio nos núcleos da base e no córtex cerebral. A doença costuma cursar com alterações da memória, funções cognitivas, distúrbios do movimento e psiquiátricos, sem relato na literatura de comprometimento visual até o momento. Apresentamos o caso de uma paciente com doença de Fahr com comprometimento visual bilateral associado a calcificações corticais no lobo occipital.

Palavras-chave: Doença de Fahr; Síndrome de Fahr; Comprometimento visual; Calcificação dos núcleos da base; Relato de caso.

INTRODUCTION

Fahr's disease (FD), also known as idiopathic Fahr's syndrome, is a rare neurodegenerative disease characterized by the abnormal deposition of calcium in the basal ganglia and cerebral cortex. The deposits are composed of calcium carbonate and calcium phosphate and are usually located in the lentiform nucleus, thalamus, hippocampus, cerebral cortex and subcortical cerebellar white matter⁽¹⁻³⁾. Its etiology has not yet been identified, but several associations have already been reported in the literature - among them, endocrinological disorders, mitochondrial myopathies, dermatological disorders and infectious diseases⁽²⁾⁽³⁾. The most common symptoms are memory changes and other cognitive functions, movement disorders and psychiatric disorders⁽³⁾. Its association with visual impairment is uncommon. We present the case of a patient with DF with bilateral visual impairment associated with cortical calcifications in the occipital lobe.

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CASE REPORT

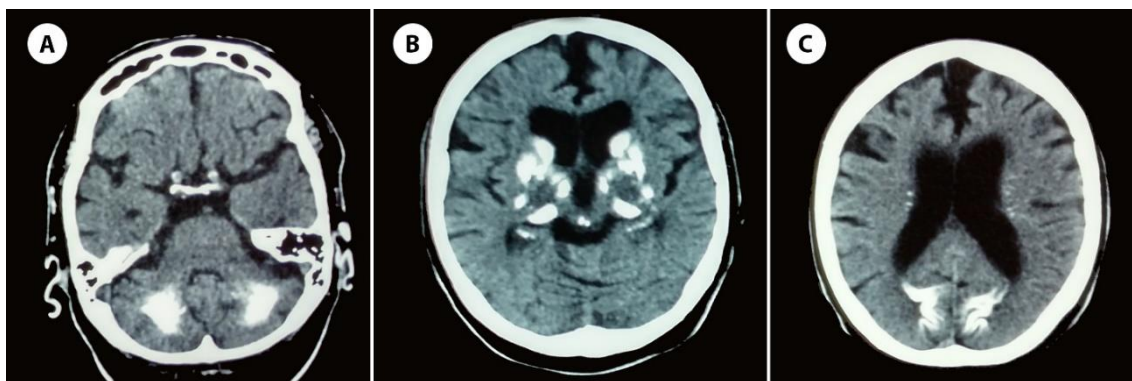
A 64-years-old female, black, completed elementary school, came to our service brought by a family member due to visual, behavioral and memory changes. The relative reports that about 2 years ago began to have difficulty in reading, apathy and emotional lability. Four months after the onset of symptoms, there was a progressive worsening of visual acuity, evolving to visual perception only for light stimuli bilaterally. In addition, she presented impulsiveness and aggressiveness in stress situations. The patient reported that she felt "turned off" and began to have difficulty remembering recent events.

She presented a morbid history of systemic arterial hypertension and dyslipidemia. Family history was negative for neurodegenerative diseases.

At the neurological examination, bilateral visual acuity reduction was identified, responding only to light stimuli, symmetrical resting tremor in both hands, dysmetria and positive Romberg test.

Screening for dementia (blood count, thyroid function, vitamin B12, TSH, free T4, viral serologies, lipid profile, renal function and electrolytes) and computed tomography (CT) scan of the head were requested. The laboratory tests did not present abnormalities, showing only a creatinine of 1.3 mg/dl and a slightly increase in total cholesterol and LDL. However, CT scan revealed calcifications involving the basal ganglia, cerebellar white matter and occipital cortex (Figure 1). At that time, the possibility of Fahr disease was raised based on the images alteration. Thus, he performed extensive investigation for pathological intracranial calcifications, including serology for viral hepatitis, syphilis, HIV, toxoplasmosis, cytomegalovirus, inflammatory activity tests, liver function, ionogram, parathyroid hormone and autoimmune diseases. The tests were unremarkable.

Figure 1 - Image of non-contrast CT scan of the head



A - Extensive calcification in the subcortical region of the cerebellum bilaterally. **B** - Various calcifications in basal ganglia bilaterally. **C** - Calcifications in the cortical region of the occipital lobe bilaterally.

Therefore, as a result of the normality of all exams, the diagnosis of FD was confirmed. Treatment for relief of symptoms was initiated with quetiapine 300 mg per day and pramipexole 3 mg per day. At 6-month follow-up, the patient was stable, but with maintenance of previous deficits. Currently, she has a clinical follow-up in a basic health unit.

DISCUSSION

Etiology and Diagnosis

FD is a rare entity, its incidence reported in the literature is $<1 / 1,000,000$, although it is believed that this value is not consistent due to lack of publications⁽³⁾⁽⁴⁾. The disease is usually observed in adults and the elderly, but the incidence rate in children is considerable⁽³⁾. It may present in familial or sporadic form, being that in familial form it is transmitted as autosomal dominant inheritance possibly through chromosome 14q, 8 and 2⁽³⁾⁽⁵⁾. The sporadic form is more rare and possibly occurs due to *de novo* mutations⁽⁵⁾.

The possible mechanism of injury of this condition is the deposit of calcium, eosinophilic and lipidic compounds in the perivascular space of the small cerebral arteries and veins. During the evolution of the disease, the calcifications extend to the neuronal tissue, causing a direct tissue injury. In addition, they cause microinfarction due to the occlusion of these small vessels⁽¹⁾⁽⁶⁾.

Diagnosis is made through history, physical examination, imaging, and exclusion of other conditions associated with calcification of the basal ganglia. These conditions include physiological causes, such as senility, and pathological causes, such as hypoparathyroidism, hypovitaminosis D, mitochondrial myopathies, lipid proteinosis, carbon monoxide poisoning,

syphilis, cytomegalovirus, rubella, herpes, and toxoplasmosis⁽³⁾⁽⁷⁾. In our case, the highly suggestive imaging findings, besides the presence of symptoms characteristic of the syndrome, were not sufficient to establish the diagnosis, requiring also extensive laboratory investigation.

CLINICAL FEATURES

The clinical manifestations of Fahr's disease have a broad spectrum, and the degree and extent of calcifications seems to be related to the intensity of symptoms⁽³⁾. The disease may present asymptotically, as an occasional radiological finding, or as a symptomatically progressive syndrome. The main clinical signs and symptoms can be divided into three major groups: neurological findings, movement disorders and psychiatric disorders. Neurological findings include spasticity, gait alteration, epilepsy, cerebellar ataxia, myoclonus, speech disorders, coma, and dementia. The frequency of extrapyramidal symptoms varies in the literature and it can reach up to 56%⁽³⁾⁽⁴⁾⁽⁸⁾. Other signs, such as papilledema, intracranial hypertension syndrome and cerebrospinal fluid pleocytosis have been reported in some studies⁽³⁾⁽⁹⁾.

Movement disturbances include parkinsonism (56%), choreic movements (19%), tremors (8%), dystonia (8%), athetosis (5%), orofacial dyskinesia, dysarthria and dysphagia (3%)⁽¹⁾⁽³⁾. It should be noted that the symptoms of parkinsonism may initially present only with hypokinesia and rigidity, with subsequent progression to the complete syndrome⁽¹⁾.

Psychiatric symptoms range from mild changes in concentration and memory to changes in personality, psychosis, depression, and dementia⁽³⁾⁽⁵⁾. Regarding these types of symptoms, it seems that the degree of calcification is not related to the severity of the condition in about 35% of patients⁽¹⁰⁾. These signs may be early manifestations of FD due to injury in the complex circuits of the basal ganglia⁽³⁾⁽¹⁰⁾.

In our case, the patient presented typical symptoms associated with FD, such as tremors, hypokinesia, changes in balance and behavioral and mood changes. However, we did not find cases of the literature associating FD with visual impairment related to calcifications of the occipital lobe.

TREATMENT AND PROGNOSIS

Currently there is no treatment that slows (or reverses) the course of the disease. Available therapies are limited to symptoms control. The main drugs used in the management are anticonvulsants, antipsychotic, dopaminergic agonists and benzodiazepines, according to

the main symptoms. There is no effective treatment for cerebellar symptoms⁽¹⁾⁽⁹⁾. As the main complaints of our patient were emotional lability and motor disturbances, we chose to prescribe an antipsychotic and a dopaminergic agonist.

The prognosis of FD is difficult to predict. The patients generally progress to severe dementia and motor impairment leading to functional disability, although there is no evidence on when this occurs. Nonetheless, the severity of the condition seems to be related to the age of onset of the disease and the extension of calcifications⁽¹⁾.

CONCLUSION

Fahr's disease is a rare neurological condition that may have a familiar or, rarely, sporadic pattern. It is a neurodegenerative condition that mainly affects the ganglia of the base and cerebral cortex through abnormal calcifications of the perivascular parenchyma⁽³⁾⁽⁶⁾. Clinical aspects associated with the disease include extrapyramidal symptoms, convulsions, psychiatric and cognitive alterations, and movement disorders⁽¹⁾⁽³⁾⁽⁵⁾⁽⁹⁾. This case demonstrated a patient with FD accompanied by the remarkable manifestation of severe visual impairment. Thus, due to the rarity of the syndrome and the lack of literature about it, complementary studies should be performed to elucidate etiological and therapeutic aspects, further other atypical manifestations slight described.

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