NEUROCOGNITIVE DISORDER AND DYSGENESIS OF CORPUS CALLOSUM

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ABSTRACT

We report the case of a 68 year-old female (O.F.), referred to our clinic for a neurological evaluation after an episode of loss of consciousness that occurred three days before admittance. She was also diagnosed with cognitive impairment (July 2011).
Case particularity: the MRI examination, which was the investigation of choice in this case, revealed structural brain abnormalities – dysgenesis of the corpus callosum.

Key words: corpus callosum, MRI, neurocognitive disorder

INTRODUCTION

The corpus callosum is the largest connective pathway in the human brain. It is made of more than 200 million nerve fibers that connect the left and right hemispheres.

Each hemisphere is specialized in controling movement and perception in the opposite half of the body, while also processing certain types of information (such as language or spatial patterns) (1, 2).

The two hemispheres must communicate with each other in order to control movements or to process complex information and the corpus callosum is the main connector that enables this communication.

Disorders of the corpus callosum, such as complete agenesis, partial agenesis, hypoplasia and dysgenesis (3), occur when the corpus callosum does not develop in a typical manner(4) and they can easily be diagnosed using imaging investigational methods.(2, 5).

CASE REPORT

O.F. is a 68 year-old woman with a low level of education (she abandoned after the 10th grade), a former employee in the chemical industry, who has been medically retired for a depressive disorder since 1998.

The patient has been diagnosed with arterial hypertension for over 30 years (with maximal systolic values up to 280 mmHg), with a depressive disorder in 1998 and cognitive impairment in 2011 and was treated with indapamidum, enalaprilum, escilatopram, sulpiridum, bromazepamum and donepezilum.

In july 2011, when the neurocognitive disorder was diagnosed, the patient had a computerized axial tomography (CT scan) examination that showed internal hydrocephalus and a fat-density image of 17/10 mm medially and left parasagitally to the ambiens cisterna, without other abnormalities.

In august 2011, she had a psychological evaluation that revealed a MMSE score of 22/30 points and a cognitive deficit with anomia, agnosia, apraxia, fixation hypomnesia, evocation hypermnesia, apato-abulia, depressive dysfunction, impaired attention and concentration. She started treatment.

The annual psychological evaluation performed in august 2013 showed a cognitive impairment with a MMSE score of 24/30 points.

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The patient was referred to our clinic in September 2013 for a neurological evaluation after an episode of loss of consciousness that occured three days before admittance. This episode lasted for 15 minutes, the patient had no seizures, no sphincter relaxation, but showed retrograde amnesia.

The neurological examination revealed a swallowing disturbance, bilateral ataxic syndrome, constructional apraxia and sphincter incontinence. She also underwent a series of tests, such as MMSE (24/30), Sunderland Clock Test(3/10), and Reisberg Scale (3/7).

As the CT scan from July 2011 was not available and the patient presented with new symptoms, a cerebral MRI examination was performed. The investigation revealed agenesis of the septum pellucidum (figure 1), partial agenesis of the corpus callosum, with the absence of the splenium (Figure 2 a, 2 b, 2 c), internal hydrocephalus (Figure 3) and an ambiens cisterna lipoma (Figure 4a, 4b, 4c, 4d, 4e).

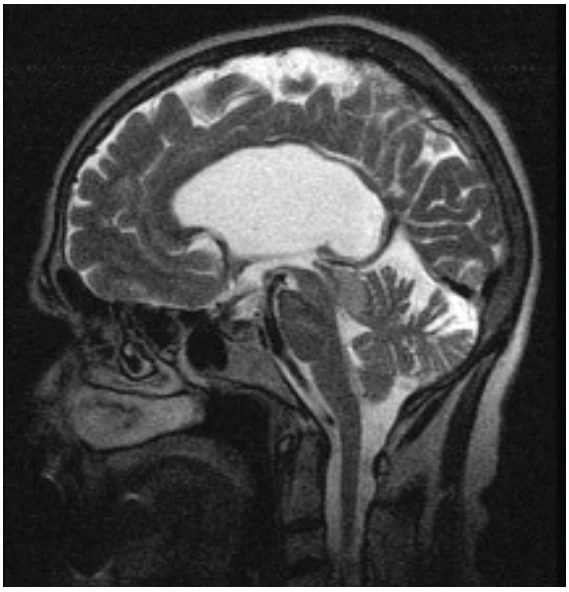

FIGURE 1. *Cerebral MRI – Agenesis of the septum pellucidum*

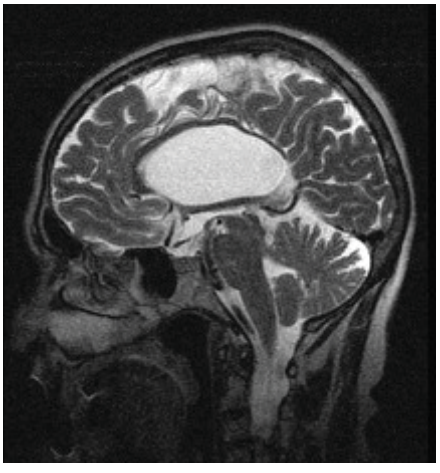

FIGURE 2a.

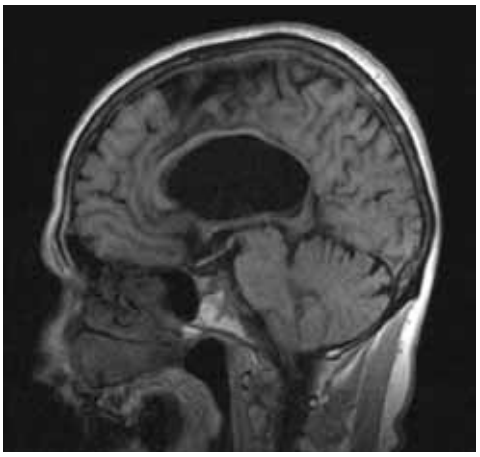

FIGURE 2B.

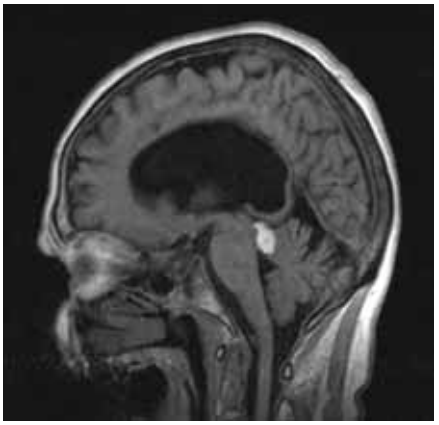

FIGURE 2c.

FIGURE 2. a, b, c. *Cerebral MRI images showing the partial agenesis of the corpus callosum, with the absence of the splenium*

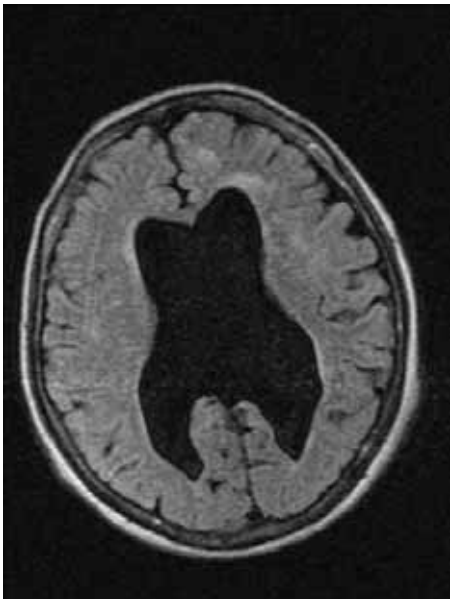

FIGURE 3. *Cerebral MRI – internal hydrocephalus*

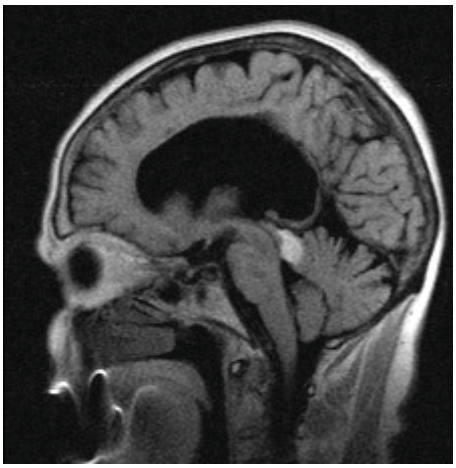

FIGURE 4a.

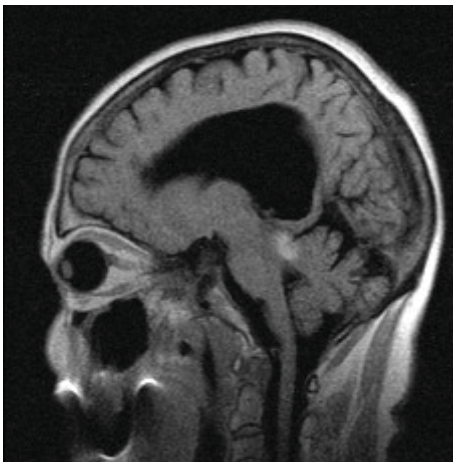

FIGURE 4b.

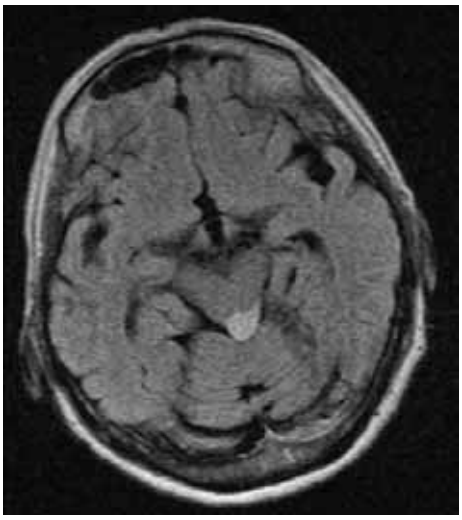

FIGURE 4c.

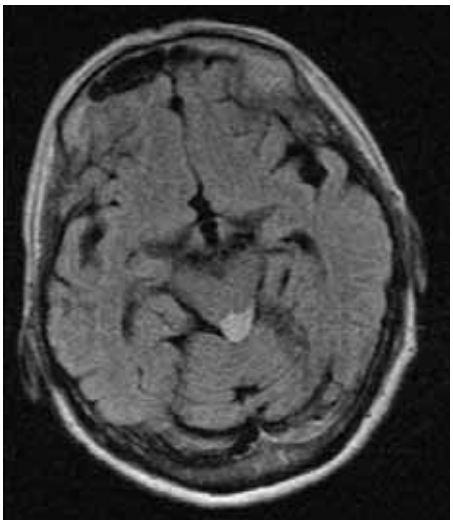

FIGURE 4d.

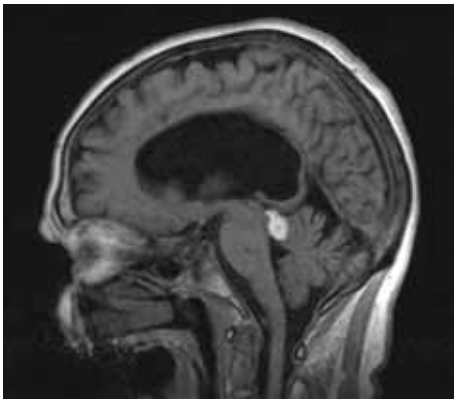

FIGURE 4e.

FIGURES 4. a, 4.b, 4.c, 4.d, 4.e *– Cerebral MRI – ambiens cisterna lipoma*

The electroencephalogram showed no significant changes, with a subdominant, spindle modulated resting medium voltage basal rhythm, of 9 cycles/sec present in the posterior areas. Hyperpneea registration showed no changes (Fig. 5.a, 5.b).

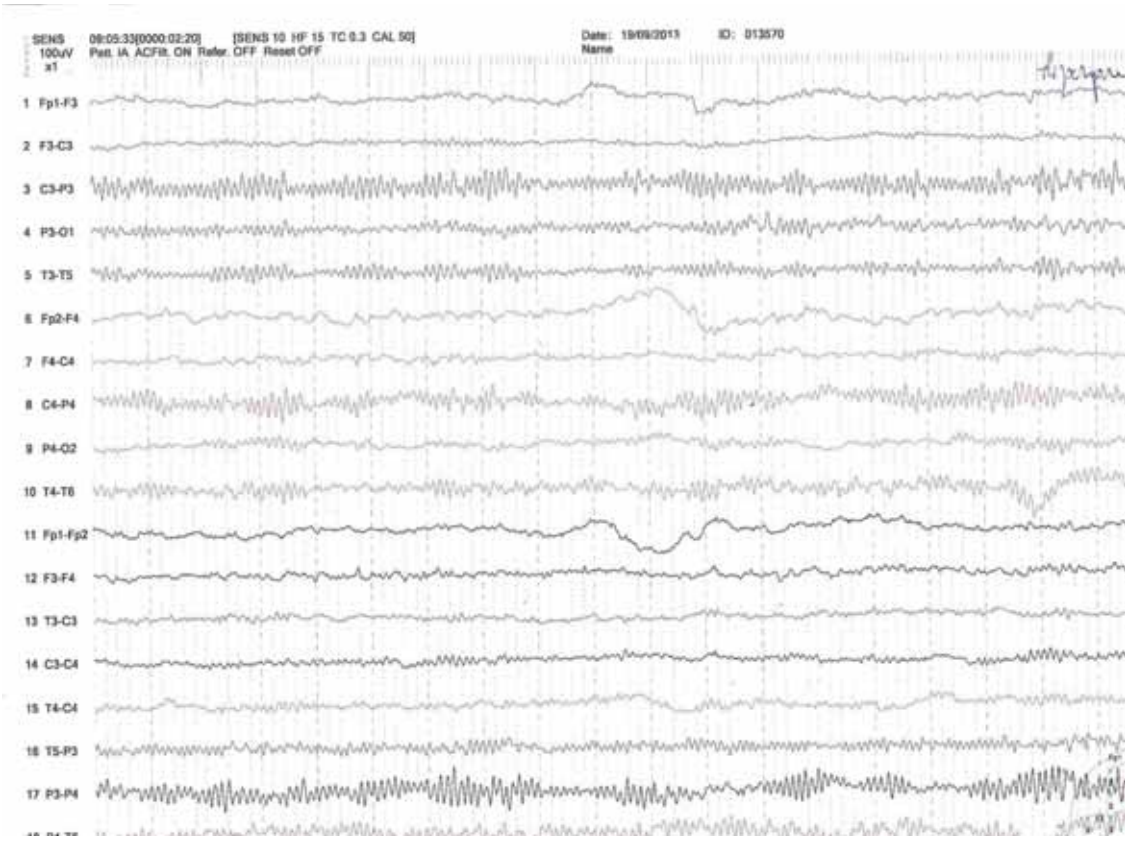

FIGURE 5a.

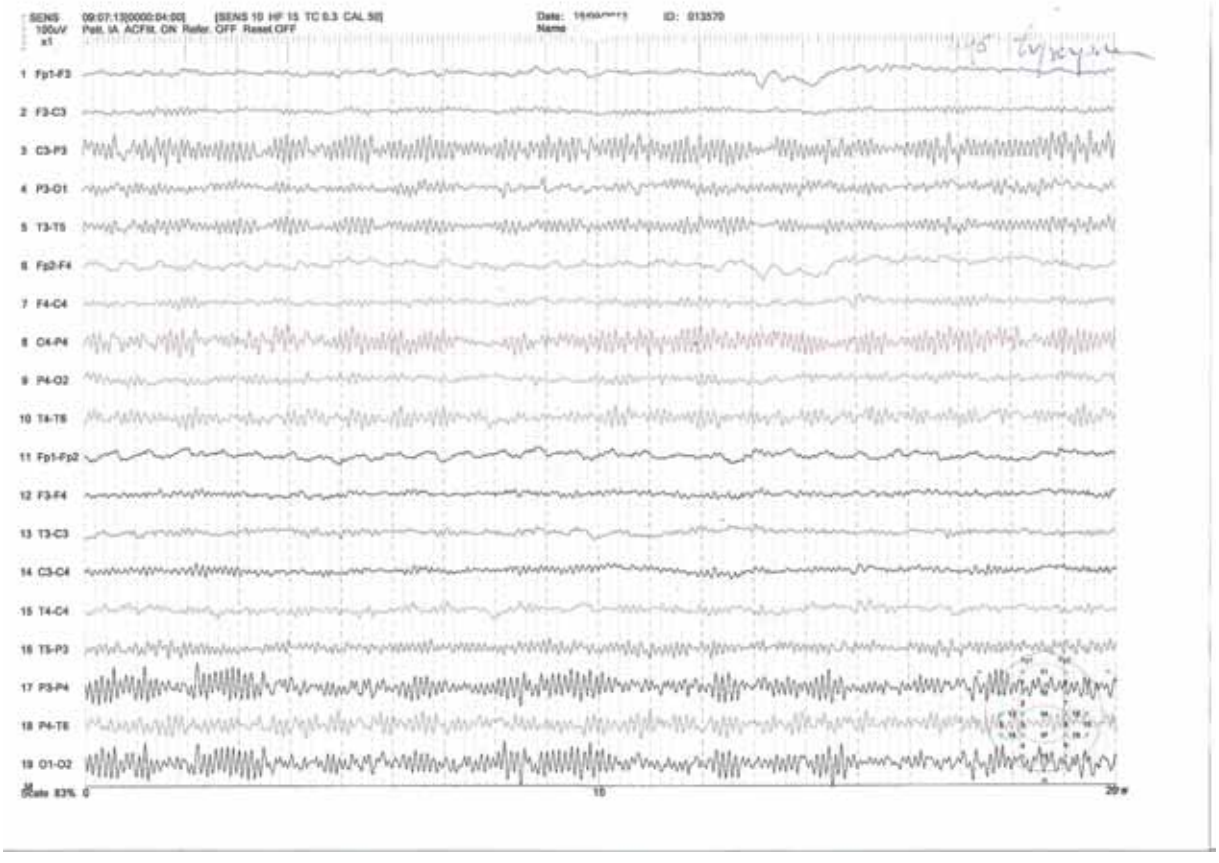

FIGURE 5b.

FIGURES 5.a., b. *– EEG: subdominant, spindle modulated resting medium voltage basal rhythm, of 9 cycles/sec present in the posterior areas, not altered by hyperpneea*

DISCUSSION

The patient obviously has had a functional impairment since her youth, as she didn't pursue her education after the 10th grade and she also retired at the age of 53, because of a depressive disorder. The functional impairment may actually have been generated by a disturbance of attention and concentration, or even by the apraxia and agnosia, which may have been overlooked. She never underwent an imagistic investigation until 2011, when her neurocognitive symptoms became more obvious and her family decided to seek medical help.

Although the 2011 CT scan also showed internal hydrocephalus, no other investigations were done until 2013, when the patient presented with additional symptoms.

CONCLUSIONS

Disorders of the corpus callosum are not illnesses or diseases, but abnormalities of the brain structure. Many people with these disorders live a healthy life, however, other individuals require medical attention due to seizures and/or other medical problems they have in addition to these abnormalities.(4).

The diagnostic process of every patient with a psychiatric disorder should always include neuroimagistic investigations in order to exclude any organic causes.

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