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MULTIPLE SYSTEM ATROPHY

CLINICAL-RADIOLOGICAL CORRELATION

Report of two cases

Adolfo V. de Albuquerque[1], Marcos R.G. de Freitas[2], Daniel Cincinatus[3], Maria Beatriz B. Harouche[1]

ABSTRACT - Multiple system atrophy (MSA) is a sporadic, neurodegenerative disorder, clinically characterized by parkinsonian, autonomic, cerebellar and pyramidal signs. We describe two patients showing different presentations of the same disease. The patient on case 1 presents features of MSA-C or olivopontocerebellar atrophy with the pontine "cross sign" on brain MRI. The second case reports a patient presenting MSA-P or striatonigral degeneration and the brain MRI shows lenticular nucleus sign alteration. We think that brain MRI might increase the accuracy diagnostic of MSA.

KEY WORDS: multiple system atrophy, olivopontocerebellar atrophy, striatonigral degeneration, Shy-Drager syndrome.

Atrofia de múltiplos sistemas: correlação clínico-radiológica. Estudo de dois casos

RESUMO - A atrofia de múltiplos sistemas (AMS) é uma doença neurodegenerativa esporádica caracterizada clinicamente por diferentes combinações de sinais parkinsonianos, autonômicos, cerebelares e piramidais. Descrevemos dois pacientes apresentando diferentes formas clínicas da mesma afecção. O caso 1 tem características da AMS-C ou atrofia olivopontocerebelar, apresentando na ressonância magnética (RM) o "sinal da cruz" na ponte. Já o caso 2 tem AMS-P ou degeneração nigro-estriatal, a RM mostra alteração do sinal no núcleo lentiforme entre outras alterações. Acreditamos que a RM cerebral possa contribuir para o melhor diagnóstico da AMS.

PALAVRAS-CHAVE: atrofia de múltiplos sistemas, degeneração nigro-estriatal, atrofia olivopontocerebelar, síndrome de Shy-Drager.

Multiple system atrophy (MSA) is a sporadic, neurodegenerative disorder, characterized by several combinations of parkinsonian, autonomic, cerebellar and pyramidal signs[1-5]. The incidence is 0.6 cases/100000/year and the prevalence ranges from 1.86 to 4.9 cases/100000[1]. The term MSA defines a distinct clinicopathological entity, including olivopontocerebellar atrophy, striatonigral degeneration and Shy-Drager syndrome, which have been described as different diseases for many years and still lead to terminology confusion. The actual consensus tries to define the diagnostic criterions and recommends the term MSA-P when parkinsonian features predominate, and the term MSA-C when cerebellar signs rules the clinical picture. There is some doubt if the term Shy-Drager syndrome should be substitute, as most cases of MSA patients develop autonomic dysfunction during their course[6]. Horimoto et al.[7] believe that some patients present a distinct form of MSA in which dysautonomic symptoms predominate, considering the utility to classify that form as MSA-A. Recently, neuroimaging studies, especially the MRI, have showed some alterations that, although not specific, may help the diagnostic of different forms of MSA.

We report two MSA cases with different clinical features and their characteristic MRI alterations.

CASES

Case 1 – A 57 year-old man, has presented erectile dys-

Neurology Division, Internal Medicine Department, Hospital Universitário Antonio Pedro, Federal Fluminense University, Niterói RJ, Brazil: [1]Neurologist; [2]Full Professor; [3]Associate Professor.

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Dr. Marcos R.G. de Freitas - Rua Gastão Ruch 16 / 1402 - 24220-100 Niterói RJ - Brasil. E-mail: mgdefreitas@hotmail.com

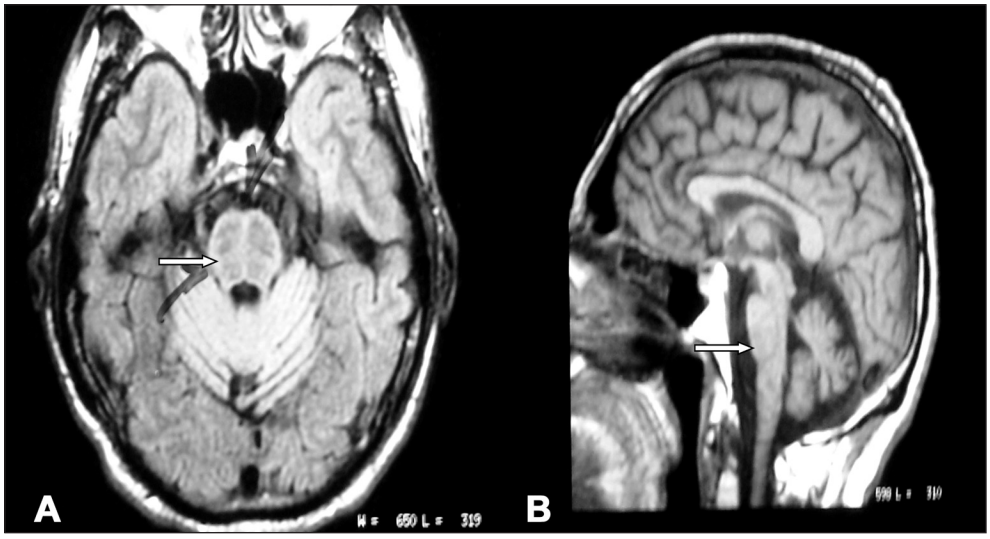

Fig 1. Case 1. MRI: (A) Pontine atrophy with the "cross sign" in T1 image (arrow). (B) Cerebellar and brainstem atrophy in T1 image (arrow).

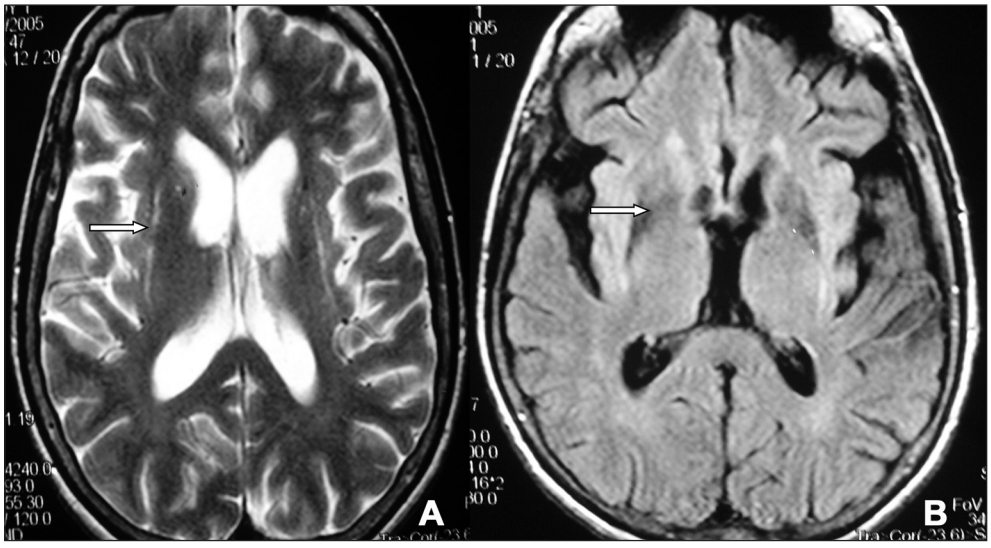

Fig 2. Case 2. MRI: (A) Marginal hyper intensity in T2 image (arrow). (B) Putaminal hypo intensity in T1 image (arrow).

function accompanied by urinary urgency since he was 53. Eighteen months after he noted gait and speech alteration. On physical and neurological examination he presented slurred speech, gait ataxia and bilateral appendicular cerebellar ataxia. The deep tendon reflexes were +++/4 and there was bilateral Babinski sign. Arterial pressure (AP) was 130X80 mmHg and radial pulse frequency 60 bpm with the patient laying down; 100X70 and 70bpm when standing up. Brain MRI showed important pontine atrophy with the "cross sign" (Fig 1A) as well as cerebellar and brainstem atrophy (Fig 1B). Six months later he presented with the same complains and the same alterations on physical examination except for worsing on orthostatic hypotension: 120X80 laying down and 80X0 standing up. Treatment with midodrine started. After six months he presented nystagmus and many episodes of syncope. Then fludrocortisone started without success. In the last 6 months, he became aid-requiring walking and presented intestinal constipation. His speech, the erectile dysfunction and the urgency incontinence have worsened. There was no familiar history of neurological disease.

Case 2 – A 64 year-old woman presented diffuse pain since she was 60. A diagnosis of fibromyalgia was given. Four years later she complained of rigidity of arms and legs mainly on the right side. Levodopa started as the diagnosis of Parkinson's disease was made but there was no improvement. She reported urinary incontinence and insomnia almost every night in the last 2 years. There was progressive deterioration of daily activities and she required aid

to walk. On general physical and neurological evaluation, she presented extrapyramidal rigidity (mainly on her right side), bradykinesia and some periods of akinesia. There was no rest or postural tremor, but the speech was slurred, very difficult to be understood. There was hyperreflexia with sinreflexia and Babinski sign on both sides. AP laying down was 149X90 and seated was 90X 50mmHg. Brain MRI shows sign alteration on lenticular nucleus (Fig 2A and 2B). She presented progressive deterioration. There was no neurological disease in her family.

DISCUSSION

We report two patients presenting two different forms of MSA, although in the first case cerebellar syndrome was the main feature and in the second case, parkinsonian symptoms were predominant. Both of them presented orthostatic hypotension and urinary incontinence (autonomic system alterations).

In the first case, the disease started when the patient was 53 years old with autonomic dysfunction and progressed with cerebellar signs within one year and six months after onset. As the cerebellar signs clearly predominate, it is classified as MSA-C or olivopontocerebellar atrophy using the old nomenclature. MRI of the brain showed the pontine "cross sign", one more feature of this type of disease (Fig 1A). In the second case, diffuse pain was the first symptom, probably resulting from extrapyramidal rigidity that soon became evident with clear asymmetry (right side more intense than the left). Two years later autonomic dysfunction and pyramidal signs have appeared. Due to the predominance of parkinsonian signs this case was classified as MSA-P. She presented a more severe clinical picture and functional deterioration, despite the same time of disease evolution.

Watanabe et al.[8] evaluating the progression of MSA in 230 Japanese patients concluded that patients presenting MSA-P have a more rapid functional deterioration when compared to those with MSA-C. In the other hand, there was no difference in the survival time.

Slurred speech was the patients main complain, limiting his daily activity. This disturb of speech is reported by other authors[9]. Kluin et al.[10], in his 46 MSA patients, found dysarthria in all of them, with different degrees of hypokinetic, ataxia and/or spasmodic component. This same study reported that in patients with MSA-P hypokinetic dysarthria predominates as much as the hypomimic facial features, and lips or tongue tremor.

Our patient number 2 presented insomnia. According to Ghorayeb et al.[11], sleep disorders are more frequent in MSA (70% of patients) than in Parkinson's disease (51%). The most common sleep disorder is fragmentation (53%), followed by early awake (33%) and insomnia (20%).

In the pathological analysis of 59 living patients who were considered to have MSA, Osaki et al.[12] tried to assess the sensibility of neurological evaluation confronting it with Quinn's criteria and the criteria defined by the consensus. They concluded that both criteria are more sensitive in the early stage of the disease, compared to the clinical assessment, but they have the same accuracy as the neurological clinical assessment in later stages of MSA. The majority of misdiagnosis patients on the study above had in fact supranuclear palsy[4,12]. MSA histopathological findings include glial cytoplasmic inclusions and neuron loss that predominates in different areas according to the clinical form of presentation[5,13,14]. These inclusions are constituted by alfa-synuclein, ubiquitin and tau protein[6,15,16].

MRI is a useful diagnostic tool in the early course of MSA-C and MSA-P. Horimoto et al.[7] report that pontine "cross sign" and lenticular nucleus sign alteration appears early in MSA-C and MSA-P respectively. Both of them appears lately in MSA-A. The characteristic T2 hyper intense sign in pons and middle cerebellar peduncle ("cross sign") reflects pontocerebellar fibers degeneration and despite very suggestive of MSA it can be found in other forms of parkinsonism[17]. Asato et al.[18] have showed that the anteroposterior diameter of the inferior portion of the pons in MSA-C patients is lower when compared to patients in the control group or with progressive supranuclear palsy. Putaminal abnormalities may be present in MSA-P patients MRI, other findings include hypo intense sign of the putamen with marginal hyper intense sign in T2. Atrophy or hyper intense sign at the pons, middle cerebellar peduncle and cerebellum may be seen. Putaminal atrophy is the most specific finds in MSA-P[17]. Our case number 2 presented putaminal hypo intensity (Fig 2B) as well as marginal hyper intensity (Fig 2A) in T2 images.

It is hard to establish the differential diagnosis with Parkinson's disease, as it can be seen in our case. Colosimo et al.[19] found, among 27 pathologically confirmed cases of MSA, 16 within an early stage only with parkinsonism. They concluded that instability due to previous falls, lack of tremor, fast progression of the disease and poor response to levodopa may be the firsts symptoms of MSA. These same authors

refer to an early asymmetric beginning of parkinsonism in 43.7% of the patients with MSA, against 25% of the patients with Parkinson's disease, although such asymmetry is not useful information for the differential diagnosis.

There is no specific treatment to MSA until the present, only symptomatic interventions[20].

Our cases are classified as likely MSA according to criteria in consensus, since the diagnosis of MSA is defined just with pathological analysis[6]. In the two cases, we try to contribute to the better acknowledgement of different ways of MSA presentations. We mainly draw attention to the importance of a good neuroradiological assessment. We concluded that the brain MRI changes might increase the accuracy diagnosis of MSA.

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