Case Report

Susac's syndrome

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ABSTRACT

We describe a 25-year-old woman that presented with frequent rotational dizziness, visual loss of the right eye one month later, and unilateral deafness one year after. After 2 years, she presented with a right hemiparesis and deafness greater for low frequency tones. Magnetic resonance imaging with angiography of the brain showed constriction in the first segment of the cerebral anterior artery diagnosed as Susac's syndrome.

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Susac's syndrome was first described in 1979, it is characterized by an encephalopathy, a retinal arteriolar occlusion and deafness caused by a small infarct in the cochlea, retina and brain.[1-4] This disease is also called SICRET syndrome (small infarctions of cochlear, retinal and encephalic tissue) or RED-M (Microangiopathy with retinopathy, encephalopathy and deafness). This entity is more frequent in young women;[5] the pathogenesis remains unknown. Several hypothesis are evoked: the embolic one, immunological and arterial spasm. Through this observation, we reinforce the last hypothesis that is the less suggested one in the literature.

Case Report. A 25-year-old woman, right-handed, operated at the age of 15-years for congenital strabismus, presented since May 1999 with headache and personality changes associated with vertigo. During July 1999, she presented an abrupt loss of vision in the right eye. Ophthalmoscopy suggested occlusion of the inferior temporal branch of the right central retinal artery; this was confirmed by fluorescing angiography **(Figure 1)**. Perimetry disclosed para central scotoma. General examination was normal, and she had no fever. Routine blood tests were normal including sedimentation rate and C-reactive protein levels. Serological tests, cultures and polymerase chain reaction for infectious agents in blood and cerebral spinal fluid (CSF) were all negative. Protein C, protein S, antithrombin III and homocysteine blood levels were normal. Tests for serum antibodies, including antinuclear factor, anti-Ro antibodies, anti-DNA, rheumatoid factor, anticardiolipin, lupus anticoagulant, and anti neutrophil cytoplasmic antibodies, were negative. Cerebral spinal fluid showed 2 lymphocytes/mm^3 and 0.5mg/l, immunoglobin G (Ig) index was normal with no oligoclonal bands. Magnetic right mentoanterior (MRA) of the brain showed a left cerebral anterior artery striation in its first segment **(Figure 2)**. Trans esophageal echocardiography during which the patient presented a transient brachio-facial right palsy, was normal; cardiac holter and supra-aortic echo doppler artery were also normal. Initial treatment included heparin relayed with oral anticoagulation therapy. The patient suffered from repeated reversible abrupt loss of vision in the left eye. During May 2000, right eye visual loss was persistent, but severe hearing loss occurred suddenly; standard audiometric tests revealed a mild bilateral high frequency sensorineural hearing loss with low and high frequency hearing loss in the

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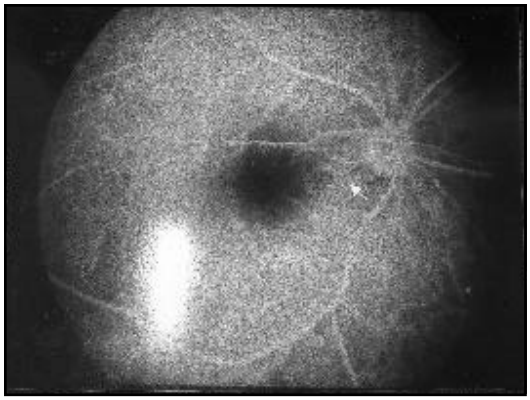

Figure 1 - Fluorescing angiography. Occlusion of the inferior temporal branch of the right central retinal artery.

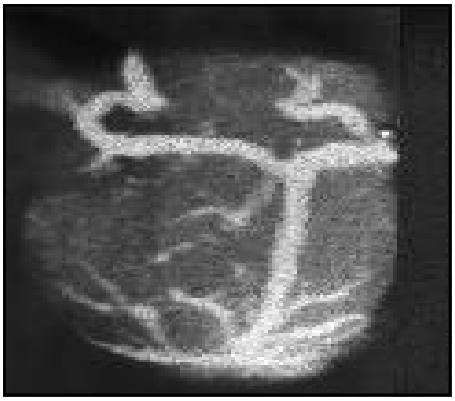

Figure 2 - Magnetic resonance angiography of the brain showed a left cerebral anterior artery striction in its first segment.

right ear. During July 2000, she suffered from recurrent brachial palsy; physical examination showed a right hypoesthesia, normal deep tendon reflexes and tonicity. Resonance magnetic angiography and CSF were normal; visual potential evoked showed stigmatic for optical neuropathy. A presumptive diagnosis of Susac's syndrome was made, the patient received high dose steroids (1g per day for 3 days) and heparin relayed with oral anticoagulation. After 6 months, anticoagulation was stopped and the patient took low dose aspirin with nimodipine. At follow up, she had no new clinical manifestations and all medication was stopped.

Discussion. Since the original description of the syndrome, fewer than 100 patients have been reported with this distinct clinical syndrome. The disease is likely under diagnosed; many receive another diagnosis, such as multiple sclerosis, migraine, lupus erythematous, Meniere disease, cardio embolic stroke and even schizophrenia.[3,6,7] This woman fulfilled the criteria of Susac's syndrome as detailed in the original description by Susac et al[8] in 1979. She had a multiple retinal arterial occlusions; an asymmetric hearing loss and neurological manifestations without numerous high-intensity-signals on T2-weighted images and on T1 weighted images after gadolinium enhancement. There are many reports of cases where not all of the clinical triad were found.[2,5,8] The most common manifestation of brain involvement in Susac's syndrome are related to problems with cognition, memory, confusion, behavioral disturbance, headaches and a bilateral pyramidal syndrome. These manifestations correspond to the characteristic multiple, small, punctate areas of T2 signal increase and contrast enhancement seen in both gray matter and white matter on MRI.[2,5,8,9] The CSF study may reveal such specific abnormalities as an elevated protein level and pleocytosis. Serum biochemical and immunological profiles are within normal limits and can, therefore, help rule out other differential diagnoses. When performed, the brain biopsy most often shows multiple microinfarctions. Ophthalmologic disorders characterized by branch retinal artery occlusions, as can be seen on ophthalmoscopy and fluorescein angiography. When symptomatic, this can determine vision field defects or vision distortion.[10,11] Cochleovestibular disorders, chiefly marked by hearing loss. It mainly involves low and medium frequencies. The disorder may be symptomatic or solely revealed by an audiometric evaluation.[2,12,13] Gait impairment is frequent and can be caused by lesions in different organs, as this syndrome involves the brain, ears, and eyes.

The pathogenesis of the syndrome is unknown. Brain and muscle biopsy specimens show small infarcts with some minimal perivascular lymphocytic infiltration, but not necrotizing vasculiti.[5,11,14,15] No procoagulant state has been documented consistently. Rarely, the IgM anti-phospholipid antibody isotype has been positive. But the IgG isotype associated with thromboembolism and results of detailed functional coagulation tests have been negative in most patients tested.[8,13,16] Vasospasm has been postulated to cause sudden hearing loss and monocular blindness in patients with migraine, although vasospasm may not be the primary mechanism for classical visual aura. A vasospastic arteriolar occlusion seems unlikely in Susac's syndrome, mainly due to CSF and brain biopsy findings.[2,5,17]

The distribution of small infarcts is attributed to the common origin embryologic of retina, inner ear and blood brain barrier. The endothelium of these structures have specific features. Structural, functional, or antigenic properties of this common endothelium may be abnormal and lead to arteriolar occlusion in Susac's syndrome.[13] Since these patients tend to improve spontaneously, it is

difficult to determine whether there is any effective treatment. Inflammatory and thrombotic physiopathogenic hypotheses have provided a basis for treatment. In the immune inflammatory hypothesis, steroids, cyclophosphamide, azathioprine, plasma exchanges and high dose intravenous immunoglobulin therapy have been tried. Following the thromboembolic hypothesis, anticoagulants, aspirin and calcium antagonists have been used to improve micro vascular blood supply. In fact, patients could improve under immunosuppressive or intra venous immunoglobulin therapy[8,9,10,13,16,17] or deteriorate despite steroids or immunosuppressive therapy;[2,8,13] also, they could improve on anticoagulation[18] or antiplatelet associated with calcium antagonist therapy,[17,19] or deteriorate despite combined anticoagulation and antiplatelet treatment[19] or recover without any therapy.[20] Due to the lack of efficacy and the side effect potential of anticoagulants and immunosuppressants, Susac et al[8] recommended starting treatment with aspirin and nimodipine. If the patient deteriorated while on this combination, we can use high dose intravenous methylprednisolone therapy; if that were unsuccessful, then we can try cyclophosphamide. Fortunately, the disorder is usually self limited, but some patients will have significant residual dysfunction.[4]

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