



Lupus leukoencephalopathy simulating progressive multifocal leukoencephalopathy

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Abstract

Lupus neurological manifestations are various. Authors report a lupus leukoencephalopathy case simulating a progressive multifocal leukoencephalopathy (PML).

Female patient of 32 years old, hospitalized in internal medicine for a long-term fever exploration. Clinical examination found a symmetrical inflammatory peripheral joint syndrome, alopecia and facial erythema in versperitilio. Laboratory tests found: severe normotoc regenerative anemia (Hb=4, 9 g/dl), Erythrocyte Sedimentation Rate accelerated to 80 mm. Proteinuria was at 1630 mg/24 hours. This clinical situation led to suspect a systemic lupus. A 500 mg/24 h of Methylprednisolone bolus was started because kidney biopsy is not feasible in our context, relayed by 1 mg/kg/day of prednisone and a transfusion. The evolution was complicated from flaccid tetraplegia.

Brain scan found diffuse and asymmetric white matter lesions that suspect a PML. HIV status was negative and the immunological assessment revealed antinuclear antibodies at 1/1280 homogeneous and speckled fluorescence; native Anti-DNA and ENA (Anti-Sm, Anti-SSA, Anti-RNP) were positive. This assessment confirms a systemic erythematosus lupus. She received daily 400 mg of Hydroxychloroquine in combination with corticosteroid therapy. Evolution was favorable in two weeks with normalization of motor skills. Control CT scan was normal. The diagnosis of Leukoencephalopathy of lupus origin was therefore retained.

Keywords: Lupus leukoencephalopathy, PML, brain scan, Cotonou

Introduction

Lupus disease is an autoimmune disease of which etiopathogenesis is mainly based on the autoantibodies that can affect any tissue or organ; and thus manifests itself in several visceral disorders of various expressions [1]. Renal and neurological disorders are the most serious [1]. Neurological manifestations during lupus are variable and frequently cause a diagnostic and therapeutic problem [2]. Their prevalence in literature is very variable ranging from 14 to 75% [2]. Among them, we could individualize the Progressive Multifocal Leucopalopathy (PML) which, frequent during HIV infection, is exceptional in lupus. Its occurrence is often correlated with immunosuppressants use [3].

Authors report a lupus leukoencephalopathy clinical case

simulating a PML and documented by CT scan.

Observation

Female patient of 32 years old, hospitalized in December 2017 in internal medicine department of CNHU-HKM at Cotonou for a long-term fever exploration. In her history, there was mainly spontaneous miscarriage at 10 weeks of amenorrhea in 2015. The patient complained of inflammatory polyarthralgia and severe asthenia. Clinical examination revealed a systemic inflammatory response syndrome, a decompensated anemic syndrome with cutaneo-mucous pallor, tachycardia (100 beats/minute), tachypnea (32 cycles/minute), a bilateral peripheral joint syndrome with involvement of wrist, metacarpophalan-

geal, proximal interphalangeal and ankles joints, an alopecia and a versperilio facial erythema. Laboratory tests found : anemia (Hb=4.9 g/dl) normogenic (MCV=86 fl) normochrome (MCH=33pg) are genative (Ret=60 G/L), lymphopenia (1.31 G/L), normal neutrophilic polynuclear rate at 1.90 G/L, accelerated erythrocyte sedimentation rate at the first hour at 80 mm and a negative CRP. 24 hours proteinuria was at 1630 mg/24h. The renal function was normal (GFR=98 ml/min).

This clinical polymorphism suspected a systemic lupus erythematosus with joint, hematologic and renal involvement.

In emergency it has implemented a treatment with a 500 mg/24h bolus of Methylprednisolone on 3 days because kidney biopsy is not feasible in our context, relayed by a maintenance dose of 1 mg/kg/day of prednisone and 3 transfusion of isorhesus isogroup red blood cells.

Evolution was characterized by a decline in initial functional symptomatology, an improvement in the hemoglobin level to 11.7 g/dl. This evolution was complicated by the sudden installation at Day 5 of hospitalization of flaccid tetraplegia without increasing blood pressure (115/70 mmHg).

The brain CT scan with and without iodine contrast agents injection, finds white matter diffuse lesions under the frontal, parietal, asymmetric bilateral occipital and cerebellar cortex (**Figure 1**) making suspect a progressive multifocal leukoencephalopathy (PML).

The lumbar puncture was acellular with a normal tensioned fluid and a normal protein rate (0.4 g/l). A brain MRI was not performed due to the lack of financial resources.

HIV serology was negative and the immunological test revealed the positivity of antinuclear antibodies with a level of 1/1280 and a homogeneous and speckled fluorescence; the anti DNA were native but the soluble nuclear antigens (Anti-Sm, Anti SSA, Anti-RNP) were positive.

This immunological assessment confirms Systemic Lupus Erythematosus (SLE).

The patient was then treated with Hydroxychloroquine 400 mg/day twice after a normal ophthalmologic checkup.

The evolution was favorable with complete recovery of motor skills in all 4 limbs after 15 days. Control brain CT scan after four weeks of treatment (corticosteroids and hydroxychloroquine) had noted a total regression of white matter lesions (**Figure 2**) found on the initial CT scan. The diagnosis of Leukoencephalopathy of lupus origin was therefore retained.

Discussion

Clinically, there were several arguments in favor of a vascular origin because of the sudden onset of symptomatology and the lupus field. But the different descriptions on the scanner with distribution of lesions in the white matter after injection of the iodine contrast agent were at a disadvantage [4,5].

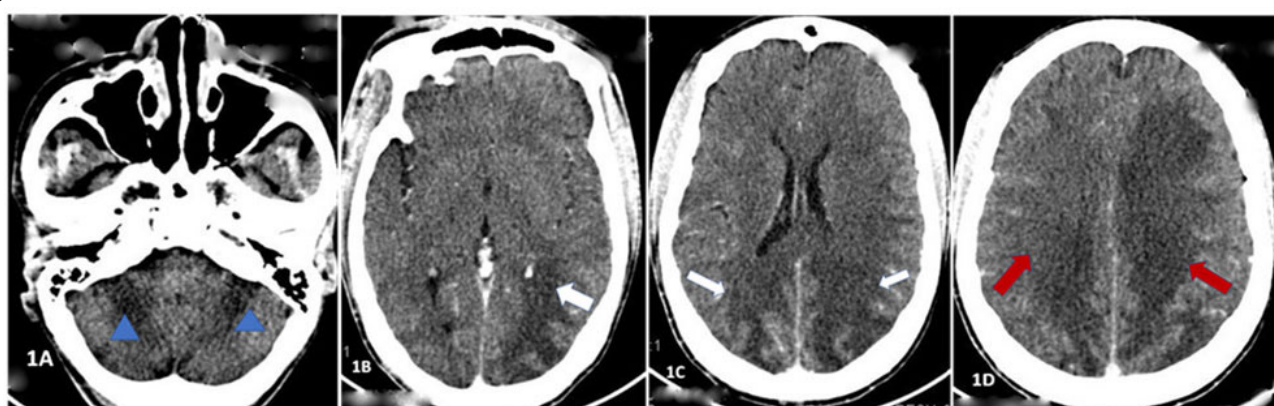
An infectious etiology could also be mentioned in this context of dysimmunitary disease especially as these manifestations occurred under corticosteroid therapy. However, the CT result and the absence of pleiocytosis at the CSF did not confirm this hypothesis.

An autoimmune inflammatory cause (disseminated acute encephalomyelitis) may also be suspected: despite diffuse cerebral involvement, the clinical context is not suggestive especially in the absence of vaccination and a recent viral infection [4].

Therefore, appearance is that of a predominantly posterior Leukoencephalopathy. This entity should discuss other assumptions:

Reversible posterior Leukoencephalopathy

Regressive Posterior Leukoencephalopathy (RPL) may be second-

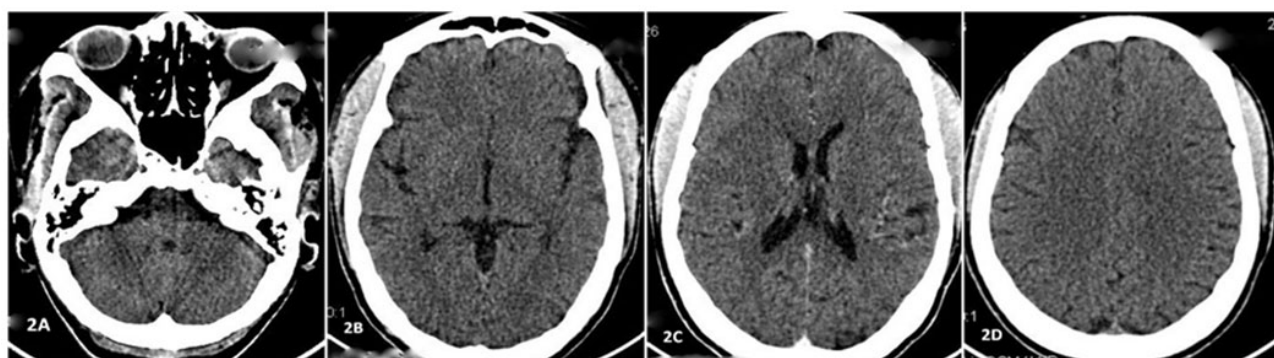


Figures 1 : Initial brain scan.

1A: Sub-tentorial axial section showing deep and subcortical white matter hypodensity of the cerebellar hemispheres (blue triangle).

1B, 1C: Axial sections showing a range of parieto-occipital (white arrow) involving deep and subcortical white matter.

1D: Supra-tentorial axial section showing a bilateral diffuse hypodensity range of the semi-oval centres (red arrows), predominant on the left with apseudo-nodular aspect (white arrow) in the left frontal region.



Figures 2. Axial infra-tentorial (2A) and supra-tentorial (2B, 2C et 2D) sections showing the total regression of the white matter hypodensity ranges.

ary to arterial hypertension often associated with renal insufficiency or immunosuppressive therapy (Cyclosporin, tacrolimus, interferon α , corticosteroids, etc.) [6] or immediately dysimmunity [7]. Symptomatology is usually regressive within two weeks if the contributing factors treatment is effective. Radiological lesions can last from six months to one year [8].

Most often, clinical manifestations are headache, confusion, visual disturbances, seizures and a hemiparesis. Evolution may spontaneously be favourable, but persistent and/or recurrent forms are described [9]. Our patient's clinical manifestations were similar but a little more severe with tetraplegia at once.

In imaging, whether on MRI or cerebral CT scan, it is a white matter lesion starting in the parieto-occipital region most often symmetrical in 98% of cases [5]. In CT scans, the lesion is marked by hypodensities not enhanced by contrast injection and MRI lesions appear in isosignal or hyposignal T1 and hypersignal T2 and FLAIR [5].

Our patient's clinical profile was more or less similar but a little more severe with quadriplegia immediately. She did not have high blood pressure or renal failure. She was also under corticotherapy. MRI could not be performed. Nevertheless, CT lesions topography was diffuse and asymmetrical. Corticotherapy was continued despite the hypothesis of its inductive role and the evolution was marked by clinical symptomatology reversibility; which allowed us to reject this diagnosis.

Progressive Multifocal Leukoencephalopathy

This is an opportunistic infection of the central nervous system by a Polyomaviridae: the JC virus, occurring in immunocompromised patients [10]. PML occurs late in the course of diseases associated with severe cellular immunity deficiency, mainly Acquired Immunodeficiency Syndrome (AIDS) and malignant blood diseases such as Hodgkin's disease and chronic lymphocytic leukaemia [11]. PML can also complicate autoimmune diseases such as systemic lupus erythematosus (SLE), most often treated with immunosuppressants [12]. Neurological manifestations are various. These are essentially confounding syndrome, motor deficit and language disorders [3]. Lumbar

puncture confirms the diagnosis when it finds a high protein level and viral DNA detection by PCR in the liquid [3]. MRI is the key diagnostic test. It reveals large multifocal ranges of hyperintense signal in T1, hyperintense in proton density, T2 and FLAIR [13]. Therapeutic trials with antivirals (cytarabine - cidofovir) have been suggested but the evolution remains fatal to date [10].

Despite the asymmetrical topography and lesions' distribution, clinical and radiological improvement in our patient oppose this diagnosis. PCR research for JC virus could not be conducted in our observation, but the CSF was acellular with normal protein rate.

Lupus-specific Leukoencephalopathy

This is a rare described clinical picture in 1992 by *Kaye and al* for the first time when they described a clinical picture simulating a PML [14]. Neurological manifestations are not particular. Imaging shows abnormalities close to multiple progressive leukoencephalopathy [13]. It seems to be an eliminatory diagnosis exclusively based on clinical and radiological evolution [7,13].

Lupus-specific lesion cannot therefore be excluded in our patient. The favourable evolution with complete disappearance of clinical symptomatology and CT lesions, corticosteroids and hydroxychloroquine therefore evoke an inflammatory origin specific to the dysimmunity disease of the patient Systemic Lupus Erythematosus.

Conclusion

Lupus-specific Leukoencephalopathy is a rare entity and could be a special form of neurolupus [7]. Difficult to diagnose because of the radiological polymorphism, clinical and radiological evolution is the keystone for diagnostic confirmation.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

Authors' contributions	AKA	ASBMG	PRDTK	WFA	ADMM	CGCD	KNFB	AKA	ZDM	HF
Research concept and design	✓	✓	✓	--	--	--	--	--	--	--
Collection and/or assembly of data	✓	✓	✓	--	--	--	--	--	--	--
Data analysis and interpretation	--	--	--	--	--	--	--	--	--	--
Writing the article	✓	✓	✓	--	--	--	--	--	--	--
Critical revision of the article	--	--	--	✓	✓	✓	✓	✓	✓	✓
Final approval of article	✓	--	--	--	--	--	--	--	--	--
Statistical analysis	--	--	--	--	--	--	--	--	--	--

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References

1. Mahfoudhi M, Mrabet N, Haddad S, El Euch M and Bani W. **Manifestations neurologiques au cours du lupus érythémateux systémique : à propos de 25 cas.** *Revue de médecine interne.* 2015; **2**:P A149.
2. Bruns A and Meyer O. **Manifestations neuropsychiatriques du lupus érythémateux disséminé.** *Revue du Rhumatisme.* 2006; **73**:1293-300.
3. Palazzo E, Yahia SA. **Leucoencéphalite multiple progressive dans les maladies auto-immunes.** *Revue du rhumatisme.* 2012; **79**:201-5. | [Article](#)
4. Lamy C, Oppenheim C, Meder JF and Mas JL. **Neuroimaging in posterior reversible encephalopathy syndrome.** *J Neuroimaging.* 2004; **14**:89-96. | [Article](#) | [PubMed](#)
5. Hugonnet E, Da Ines D, Boby H, Claise B, Petitcolin V, Lannareix V and Garcier JM. **Syndrôme d'encéphalopathie postérieure réversible (EPR) : aspects en imagerie TDM et IRM.** *Journal de radiologie diagnostique et interventionnelle.* 2013; **94**:44-51. | [Article](#)
6. Warnatz K, Peter HH, Schumacher M, Wiese L, Prasse A, Petschner F, Vaith P, Volk B and Weiner SM. **Infectious CNS disease as a differential diagnosis in systemic rheumatic diseases: three case reports and a review of the literature.** *Ann Rheum Dis.* 2003; **62**:50-7. | [Article](#) | [PubMed Abstract](#) | [PubMed FullText](#)
7. J. Cohen-Solal, C. Sordet, C. Bouvet, J.M. Woehl, J.L. Dietmann and J.L. Kuntz et al. **Leucoencéphalopathie au cours d'un lupus érythémateux systémique.** *La lettre du rhumatologue.* 2004; **304**:33-5.
8. Mohebi Amoli A, Mégarbane B and Chabriet H. **La leucoencéphalite postérieure réversible.** *Réanimation.* 2007; **16**:490-7.
9. Servillo G, Bifulco F, De Robertis E, Piazza O, Striano P, Tortora F, Striano S and Tufano R. **Posterior reversible encephalopathy syndrome in intensive care medicine.** *Intensive Care Med.* 2007; **33**:230-6. | [Article](#) | [PubMed](#)
10. Terrier B, Hummel A, Fakhouri F, Jablonski M, Hügler T and Gasnault J et al. **Leucoencéphalite multifocale progressive en dehors du sida : efficacité de l'association cytarabine-cidofovir.** *La Revue de médecine interne.* 2007; **28**:488-91.
11. Hou J and Major EO. **Progressive multifocal leukoencephalopathy: JC virus induced demyelination in the immune compromised host.** *J Neurovirol.* 2000; **6 Suppl 2**:S98-S100. | [PubMed](#)
12. Itoh K, Kano T, Nagashio C, Mimori A, Kinoshita M and Sumiya M. **Progressive multifocal leukoencephalopathy in patients with systemic lupus erythematosus.** *Arthritis Rheum.* 2006; **54**:1020-2. | [Article](#) | [PubMed](#)
13. Dieteman J-L. **Précis Neuro imagerie diagnostic.** Paris : Elsevier-Masson. 2008; 477-528.
14. Kaye BR, Neuwelt CM, London SS and DeArmond SJ. **Central nervous system systemic lupus erythematosus mimicking progressive multifocal leukoencephalopathy.** *Ann Rheum Dis.* 1992; **51**:1152-6. | [Article](#) | [PubMed Abstract](#) | [PubMed FullText](#)

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