* Corresponding author.
E-mail address: alba.lopez.bravo@gmail.com
(A. Lopez-Bravo).

https://doi.org/10.1016/j.nrleng.2021.01.001
2173-5808/

Spontaneous spinal epidural hematoma and nonaneurysmal subarachnoid haemorrhage in patient with eosinophilic granulomatosis with polyangiitis☆

Hematoma epidural espinal espontáneo y hemorragia subaracnoidea no aneurismática en paciente con granulomatosis eosinofílica con poliangitis

Dear Editor:

Eosinophilic granulomatosis with polyangiitis (EGPA) is a type of systemic necrotising vasculitis affecting small- and medium-sized vessels, which belongs to the spectrum of anti-neutrophil cytoplasmic antibody (ANCA)—associated vasculitis. Disease progression presents 3 phases, which may or may not be sequential: an allergic phase (asthma, rhinitis, and nasal polyposis), an eosinophilic phase (eosinophilia in peripheral blood or lung or gastrointestinal tissues), and a vasculitic phase, which may involve multiple organs, including the peripheral and, rarely, the central nervous systems (CNS). In 1990, the American College of Rheumatology created a set of diagnostic criteria (asthma, eosinophilia > 10% in peripheral blood, mono- or polyneuropathy, non-fixed pulmonary infiltrates, paranasal sinus abnormalities, and extravascular eosinophilia), with diagnosis being established in patients meeting 4 of the 6 criteria; these criteria have sensitivity of 85% and specificity of 99.7%[1]. Treatment includes corticosteroids and such immunosuppressants as cyclophosphamide in refractory cases. Current series suggest a clear improvement in survival rates, increasing from 70% to 90% at 5 years[2]. Cardiac involvement is the main cause of death in patients with EGPA, followed by brain haemorrhage.

We report the case of a 54-year-old man diagnosed with EGPA due to history of severe cortico-dependent asthma, paranasal polyposis, eosinophilic dermatitis, peripheral eosinophilia, and recently diagnosed axonal sensory polyneuropathy. He was treated exclusively with prednisone, dosed at 5 mg/day.

The patient was assessed at the emergency department due to a 48-h history of spontaneous, sudden-onset low back pain, developing into progressive weakness of the left leg, paraesthesia in the left thigh, pollakiuria, and constipation. Physical examination identified no fever, and arterial blood pressure was 157/111 mm Hg. Neurological examination revealed proximal weakness (3/5) in the left leg, hypoaesthesia at the L1 level, exaggerated left patellar and Achilles reflexes, and left Babinski sign. At baseline, laboratory results (glycaemia, ions, liver and kidney function) and coagulation were normal. A complete blood count revealed leukocytosis (20 000 cells/μL; normal range: <10 200) and eosinophilia (1300 cells/μL [14.8%]; normal range, 500 [<5% of total]). A chest radiography displayed no abnormalities. A thoracolumbar MRI study (Fig. 1A) identified epidural haemorrhages at the T8-L1 and S1-S2 levels; emergency T12-L1 laminectomy and evacuation of the haemorrhages were performed. A spinal cord arteriography performed 24 h after the procedure revealed normal findings.

On the third day after admission, the patient presented a sudden decrease in the level of consciousness; a head CT scan (Fig. 1B) detected a spontaneous subarachnoid haemorrhage (SAH), classed as grade IV on the Fisher scale. A subsequent CT angiography identified no relevant alterations. A brain arteriography performed 36 h later yielded normal findings. The patient died on day 6 after admission.

Our patient meets diagnostic criteria for EGPA of 3 years of progression; given the recent diagnosis of polyneuropathy, it may be classified as being in the vasculitic phase[3].

CNS involvement is reported in 6%—10% of cases of EGPA[4], with ischaemic stroke and brain haemorrhages being particularly common; multiple strokes may occur, and stroke may be the first sign of the disease[4—12]. Spinal haemorrhages are much rarer[13,14].

The largest series of haemorrhagic complications involving the CNS in patients with EGPA is probably that reported by Sabio et al.[3] Of 28 patients diagnosed with EGPA, 14 (50%) presented spontaneous SAH, 13 (46%) presented intraparenchymal haemorrhage, 5 (17.9%) presented intraventricular haemorrhage, and 3 (10.7%) presented spinal haematomas. Ross et al.[14] report 6 cases of EGPA with spinal complications, including 4 with subdural or subarachnoid haemorrhage.

Our patient initially presented a spontaneous spinal epidural haematoma (SSEH), as observed in the neuroimaging study and confirmed during surgery, and subsequently a spontaneous SAH.

It has been suggested that spontaneous SAH in the context of EGPA may be explained both by vasculitis, with disruption of the internal elastic lamina, and by rupture of the post-stenotic dilatation caused by granuloma formation

☆ Please cite this article as: Lázaro Romero A, Carilla Sanromán A, Horna Cañete L, Serrano Ponz M. Hematoma epidural espinal espontáneo y hemorragia subaracnoidea no aneurismática en paciente con granulomatosis eosinofílica con poliangitis. Neurología. 2021;36:723—725.

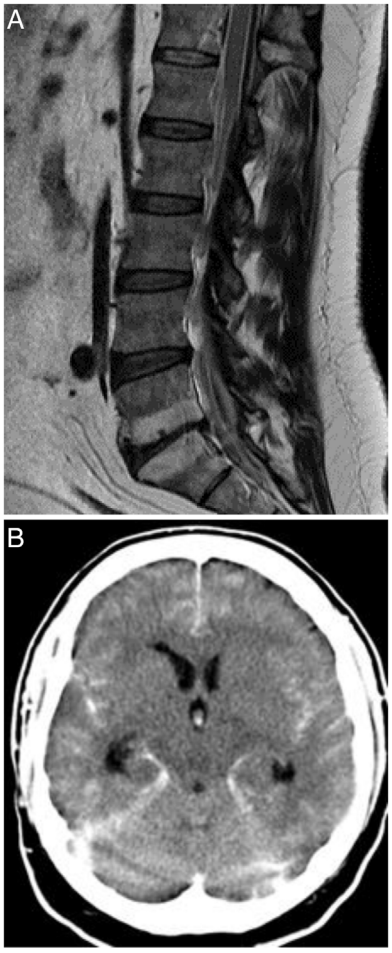

Figure 1 (A) T1-weighted MRI study of the spine (sagittal plane), showing epidural haemorrhage of the thoracolumbar spine. Loculi with greater posterior blood pooling are observed at the T12-L1 and S1—S2 levels. The morphology of the spinal cord is normal. (B) Non-contrast head CT scan showing perimesencephalic, intraventricular, and cerebellar subarachnoid haemorrhage (Fisher grade IV).

in small vessels. The cause of SSEH is undetermined in 40% of cases. Some authors propose that it may be caused by venous plexus involvement, whereas others consider it to originate in the epidural arteries.

In our patient, the fact that SSEH occurred in the context of EGPA, almost simultaneously with spontaneous SAH, suggests vasculitis as the most probable cause[15]. To our knowledge, this is the first case of SSEH in a patient with EGPA. The simultaneous presentation of spontaneous SAH in the brain is also unusual.

Funding

This study has received no specific funding from any public, commercial, or non-profit organisation.

Consent

Consent was not obtained from the patient due to his death. The final author certifies the effort made to search for family contacts and the complete anonymisation of patient data.

Acknowledgements

We would like to thank Dr J.M. Sabio of the internal medicine department at Hospital Virgen de las Nieves, Granada (Spain), for his series of patients with EGPA and CNS complications.

References

1. Masi AT, Hunder GG, Lie JT, Michel BA, Bloch DA, Arend WP, et al. The American College of Rheumatology 1990 criteria for the classification of Churg-Strauss syndrome (allergic granulomatosis and angiitis). Arthritis Rheum. 1990;33:1094—100, http://dx.doi.org/10.1002/art.1780330806.
2. Moosig F, Bremer JP, Hellmich B, Holle JU, Holl-Ulrich K, Laudien M, et al. A vasculitis centre based management strategy leads to improved outcome in eosinophilic granulomatosis and polyangiitis (Churg-Strauss, EGPA): monocentric experiences in 150 patients. Ann Rheum Dis. 2013;72:1011—7 http://dx.doi.org/10.1136/annrheumdis-2012-201531
3. Sabio JM, Rivero-Rodriguez M. Demographic and clinical characteristics associated with central nervous system hemorrhage in patients with eosinophilic granulomatosis with polyangiitis: a case report and review of the literature. J Rheumatol. 2017;44:1413—5, http://dx.doi.org/10.3899/jrheum.160886.
4. André R, Cottin V, Saraux JL, Blaison G, Bienvenu B, Cathebras P, et al. Central nervous system involvement in eosinophilic granulomatosis with polyangiitis (Churg-Strauss): report of 26 patients and review of the literature. Autoimmun Rev. 2017;16:963—9, http://dx.doi.org/10.1016/j.autrev.2017.07.007.
5. Go MH, Park JU, Kang JG, Lim YC. Subarachnoid and intracerebral hemorrhage in patients with Churg-Strauss syndrome: two case reports. J Cerebrovasc Endovasc Neurosurg. 2012;14:255—61, http://dx.doi.org/10.7461/jcen.2012.14.3.255.
6. Calvo-Romero JM, del Carmen Bonilla-Gracia M, Bureo-Dacal P. Churg-Strauss syndrome presenting as spontaneous subarachnoid haemorrhage. Clin Rheumatol. 2002;21:261—3, http://dx.doi.org/10.1007/s10067-002-8293-4.
7. Sheerin UM, Barreto J, Brown MM, Brew S, Losseff NA. Subarachnoid haemorrhage as the first clinical manifestation of Churg-Strauss syndrome. J Neurol. 2008;255:607—8, http://dx.doi.org/10.1007/s00415-008-0975-7.
8. Taormina G, Andolina G, Banco MA, Costanza-Gaglio EJ, Bonurav A, Buscemi S. An uncommon presentation of eosinophilic granulomatosis with polyangiitis: a case report. J Med Case Rep. 2014;13:190, http://dx.doi.org/10.1186/1752-1947-8-190.
9. Matsuda S, Yoshida S, Fujiki Y, Satomi H, Takeuchi T, Hirose Y, et al. Eosinophilic granulomatosis with polyangiitis complicated by subarachnoid hemorrhage and coronary vasculitis: a case report and review of the literature. Rheumatol Int. 2018;38:689—96, http://dx.doi.org/10.1007/s00296-017-3875-2.
10. Lee MXW, Teng GG, Raju GC, Lim AYN. Catastrophic subarachnoid hemorrhage in eosinophilic granulomatosis with

polyangiitis without asthma. Int J Rheum Dis. 2017;20:2127—31, http://dx.doi.org/10.1111/1756-185X.12594.
11. Yamada Y, Ando S, Umeda Y, Umeda M, Oyake M, Fujita N. A case of multiple cerebral hemorrhage caused by sudden increase of eosinophil in a patient with eosinophilic granulomatosis with polyangiitis. Rinsho Shinkeigaku. 2018;58:565—9, http://dx.doi.org/10.5692/clinicalneurol.cn-001188.
12. Ito M, Kato N, Su CC, Kayama T. A case of Churg-Strauss syndrome with subarachnoid hemorrhage. Brain Nerve. 2014;66:283—8. PMID: 24607952.
13. Diamanti L, Berzero G, Bini P, Ravaglia S, Rognone E, Cavagna L, et al. Spinal hemorrhage in eosinophilic granulomatosis with polyangiitis (Churg-Strauss). J Neurol. 2014;261:438—40, http://dx.doi.org/10.1007/s00415-013-7217-3.
14. Ross L, Leung J, Ngian GS. Spinal cord injury secondary to eosinophilic granulomatosis with polyangiitis: case report and review of the literature. JClin Rheumatol. 2018. PubMed PMID: 30222627.
15. Harland TA, Seinfeld J, Cava LF, Neumann RT, Roark C, Kumpe D, et al. Anti-neutrophil cytoplasmic antibody associated central nervous system vasculitis with brain and spinal cord subarachnoid hemorrhage: a rare case report and review of the literature. J Clin Neurosci. 2019;62:253—5, http://dx.doi.org/10.1016/j.jocn.2018.12.001.

A. Lázaro Romero*, A. Carilla Sanromán, L. Horna Cañete, M. Serrano Ponz

Hospital Universitario Miguel Servet, Zaragoza, Spain

* Corresponding author.
E-mail address: albalazaroromero@gmail.com (A. Lázaro Romero).

https://doi.org/10.1016/j.nrleng.2020.12.002
2173-5808/

Abnormal growth of Virchow-Robin spaces secondary to radiotherapy☆

Crecimiento anormal de espacios de Virchow-Robin secundario a radioterapia

Dear Editor:

The terms perivascular space or Virchow-Robin space (VRS) refer to the spaces surrounding the vessels supplying the brain parenchyma, and constitute a separate structure from the subarachnoid space. In MRI studies, dilated VRS typically appear as round or linear shapes and are isointense to cerebrospinal fluid (CSF) on all sequences. Generally, the parenchyma surrounding these spaces presents normal signal intensity. While they usually appear in typical locations (basal ganglia, subcortical white matter, midbrain), dilated VRS may occur in practically any location.[1]

Dilated VRS are a frequent neuroimaging finding, and their prevalence is greater in elderly individuals or patients with small-vessel disease, associated with lacunar stroke and vascular leukoencephalopathy.[2,3] Despite this, the mechanism by which these spaces become dilated remains unclear; multiple theories have been proposed, including increased arterial wall permeability, alterations in CSF drainage, spiral elongation of blood vessels, and brain atrophy. A correlation has been described between dilated VRS and neuropsychiatric disorders, multiple sclerosis, traumatic brain injuries, and microvascular diseases.[1,4] Some of these situations are equivalent in pathological terms to the effects of radiotherapy, such as white matter oedema, demyelination, fibrinoid changes in blood vessels, coagulative necrosis, and cysts with liquefied centres and peripheral gliosis.[5] Recently, brain radiotherapy has been proposed as a likely cause of dilated VRS.[6,7]

We present the case of a 63-year-old man who attended the emergency department due to a seizure in 2012, reporting similar episodes of absence seizures in the previous months, with no other relevant personal history. An emergency head CT scan revealed an intra-axial lesion in the right frontal lobe. The study was subsequently expanded with an MRI scan and a biopsy study, which confirmed the diagnosis of diffuse astrocytoma with foci of anaplastic transformation. Four months later, the patient started chemotherapy (temozolomide) and radiotherapy, with a total dose of 60 Gy in fractions of 2 Gy/day between October and November 2012. The patient subsequently underwent clinical and neuroimaging (MRI) follow-up by the oncology department.

The follow-up brain MRI scan performed in 2017 detected a new cystic lesion in the right corona radiata, which displayed progressive growth in subsequent studies (Fig. 1). Clinical examination identified no new neurological alterations or deficits. The lesion was cystic and septated, isointense to CSF on all sequences, was not surrounded by oedema or gliosis, and presented no diffusion restriction or contrast enhancement. It was located in the radiation field and surrounded by multiple punctiform haemorrhagic foci, visible on magnetic susceptibility sequences, in the adjacent white matter (Fig. 2).[8]

In the light of these findings, differential diagnosis may include cystic neoplasm, infectious lesions, or ischaemic lesions. Purely cystic brain neoplasms are extremely rare, and the absence of oedema or contrast uptake makes this diagnosis highly unlikely. The lack of associated symptoms or diffusion restriction allows us to rule out such infectious lesions as abscesses. The absence of adjacent or distant white matter alterations and the progressive growth of the lesion favoured a diagnosis of dilated VRS, rather than a lacunar ischaemic lesion.

☆ Please cite this article as: Pérez García MC, Láinez Ramos-Bossini AJ, Martínez Barbero JP. Crecimiento anormal de espacios de Virchow-Robin secundario a radioterapia. Neurología. 2021;36:725—728.