

Reversible cerebral vasoconstriction syndrome

Published on 23.04.2018

DOI: 10.1594/EURORAD/CASE.15285

ISSN: 1563-4086

Section: Neuroradiology

Area of Interest: Neuroradiology brain

Procedure: Diagnostic procedure

Imaging Technique: CT

Imaging Technique: MR

Imaging Technique: Catheter arteriography

Special Focus: Haemorrhage Haemodynamics / Flow
dynamics Ischaemia / Infarction Case Type: Clinical
Cases

Authors: Barreda-Solana M, Oprisan A, Aparici-Robles
F, Pérez-Girbes A, Carreres-Polo J, Mazón-Momparler
M.

Patient: 60 years, female

Clinical History:

A 60-year-old female patient presented with an episode of intense headache. She had a personal history of recurrent migraines, hypertension and smoking.

Imaging Findings:

On the first day, the initial non-contrast head CT demonstrated a small focus of subarachnoid haemorrhage and a small parenchymal haematoma on the right frontal lobe (Fig. 1). The MRI images (T2/FLAIR and T2*-weighted images) showed a subarachnoid haemorrhage associated with the frontal parenchymal haematoma (Fig. 2). On the third day, the digital subtraction angiography (DSA) demonstrated a segmental and a multifocal vasoconstriction in the small and the medium calibre vessels in the territory of the middle and the anterior cerebral arteries (Fig. 3). Ten days later, a follow up MRI was performed, showing an acute infarction of a small segment of the left occipital lobe, which is characterised by hyperintensity on DWI and T2-weighted images (Fig. 4). Six months later, a follow-up DSA showed a normalisation of the calibre of the vessels and of the contours of both carotid arteries (Fig. 5). Follow-up MRI showed the resolution of the right frontal haematoma and the absence of the new brain lesions.

Discussion:

Reversible Cerebral Vasoconstriction is a syndrome that debuts as an episode of intense headache secondary to a diffuse vasoconstriction of multiple segments of the cerebral arteries (1).

This vasoconstriction is produced by alterations in the cerebral vascular tone, either of spontaneous origin or triggered by the vasoactive drugs, the pregnancy, the postpartum period, traumas and some tumors, among others (1, 2).

It usually affects young women of reproductive age, manifesting itself as an acute episode of intense headache, and may be associated with some vegetative symptoms. The evolution of the disease is usually self-limited and monophasic, with resolution of the symptoms in weeks and the cerebral vasoconstriction in a maximum of 3 months

(2, 3). Most cases do not have complications; however, the cerebral infarctions or the intracranial hemorrhages may occur in a minority of patients, as in the case presented (3).

The self-limiting nature of the headache and the angiographies alterations is the characteristic that orientates us to differentiate it from the symptoms that may have a similar clinical presentation, such as subarachnoid hemorrhage or central nervous system vasculitis, and we must think about this diagnosis in a patient with an intense headache that presents a CT-scan and CSF analysis without alterations (2, 4).

Angiography is the gold standard test to visualize the cerebral vasoconstriction and allows the physicians to evaluate the evolution of the clinical picture, demonstrating the reversibility of it (5). It can also be studied through non-invasive studies, such as angio-CT or angio-MRI, which also allows the assessment of alternative diagnoses and the presence of complications (6, 7).

Although there is no standardized treatment, in general, the management is based on the basic medical measures such as removing the exogenous triggers, the pain management through medical treatment, and the use of vasodilators (3). The calcium channel blockers are the first-line drugs to be used. In general, better results are obtained with an effective resolution of the symptoms (2, 3).

Our patient received a conservative medical treatment, showing a favorable evolution, with pain resolution, angiographic alterations and without neurological sequelae.

Differential Diagnosis List: Reversible cerebral vasoconstriction syndrome, Subarachnoid haemorrhage with intracranial vasospasm, Primary angiitis of the central nervous system, Arterial dissection

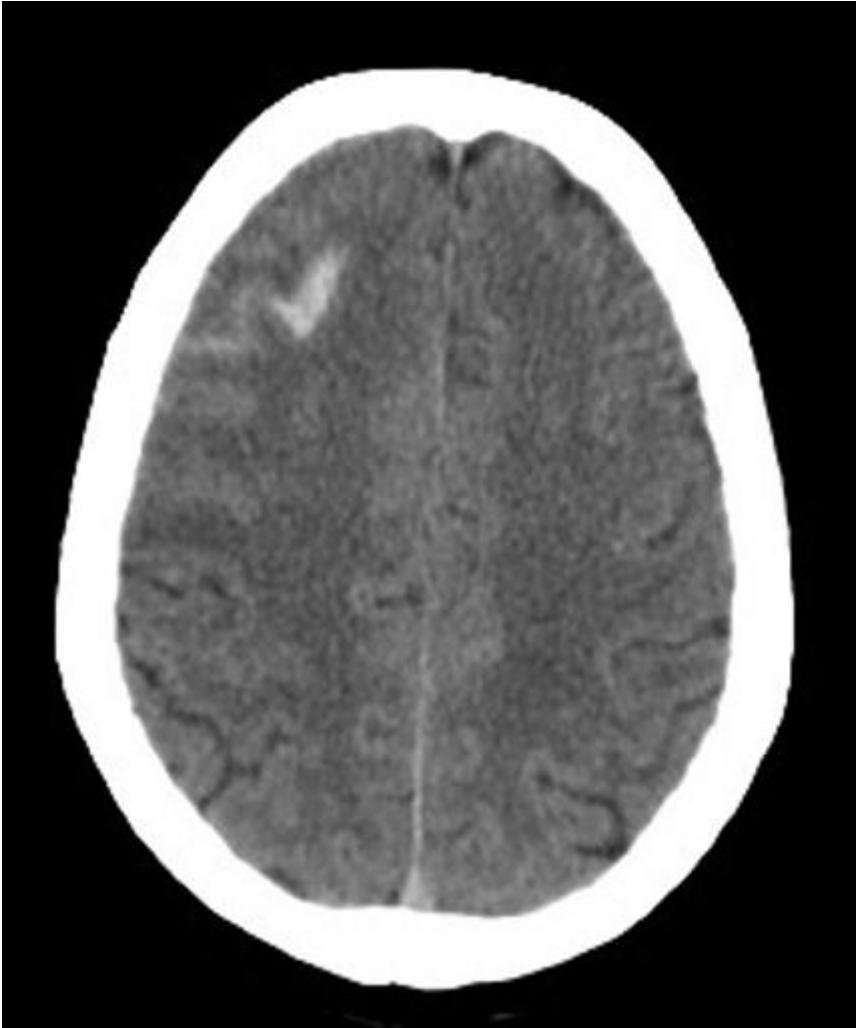
Final Diagnosis: Reversible cerebral vasoconstriction syndrome

References:

- Sattar A, Manousakis G, Jensen MB. (2010) Systematic review of reversible cerebral vasoconstriction syndrome. *Expert Rev Cardiovasc Ther* 8(10):1417-1421 (PMID: [20936928](#))
- Miller TR, Shivashankar R, Mossa-Basha M, Gandhi D. (2015) Reversible Cerebral Vasoconstriction Syndrome, Part 1: Epidemiology, Pathogenesis, and Clinical Course. *AJNR Am J Neuroradiol* 36:1392-1399 (PMID: [25593203](#))
- Ducros A. (2012) Reversible cerebral vasoconstriction syndrome. *Lancet Neurol* 11(10):906-917 (PMID: [22995694](#))
- Skeik N, Porten B, Kadkhodayan Y, McDonald W, Lahham F. (2015) Postpartum reversible cerebral vasoconstriction syndrome: Review and analysis of the current data. *Vascular Medicine* 20(3):256-265 (PMID: [25835347](#))
- Miller TR, Shivashankar R, Mossa-Basha M, Gandhi D. (2015) Reversible Cerebral Vasoconstriction Syndrome, Part 2: Diagnostic Work-Up, Imaging Evaluation, and Differential Diagnosis. *AJNR Am J Neuroradiol* 36:1580-8 (PMID: [25614476](#))
- Marder CP, Donohue MM, Weinstein JR et-al. (2012) Multimodal imaging of reversible cerebral vasoconstriction syndrome: a series of 6 cases. *AJNR Am J Neuroradiol* 33 (7): 1403-10 (PMID: [22422190](#))
- Chen SP et al (2010) Magnetic resonance angiography in reversible cerebral vasoconstriction syndromes. *Ann Neurol* 67(5):648-56 (PMID: [20437562](#))

Figure 1

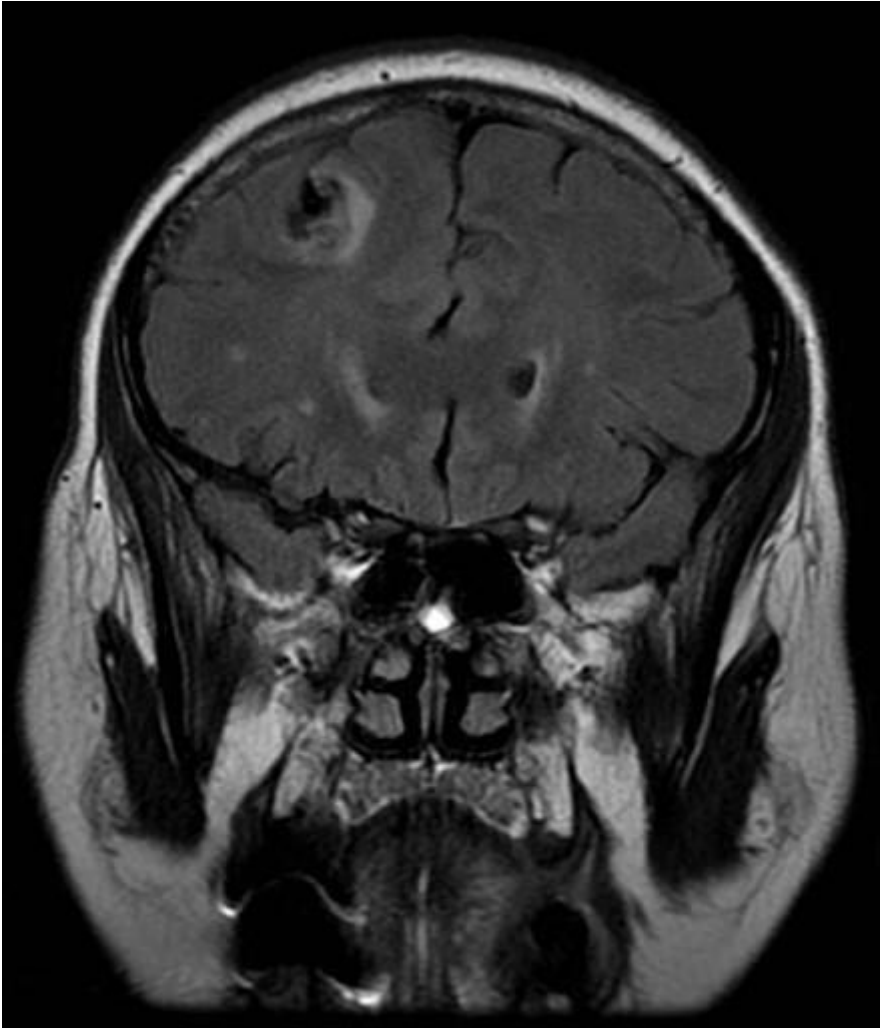
a



Description: Non-contrast head CT demonstrated a focus of subarachnoid haemorrhage and a small parenchymal haematoma on the right frontal lobe. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.

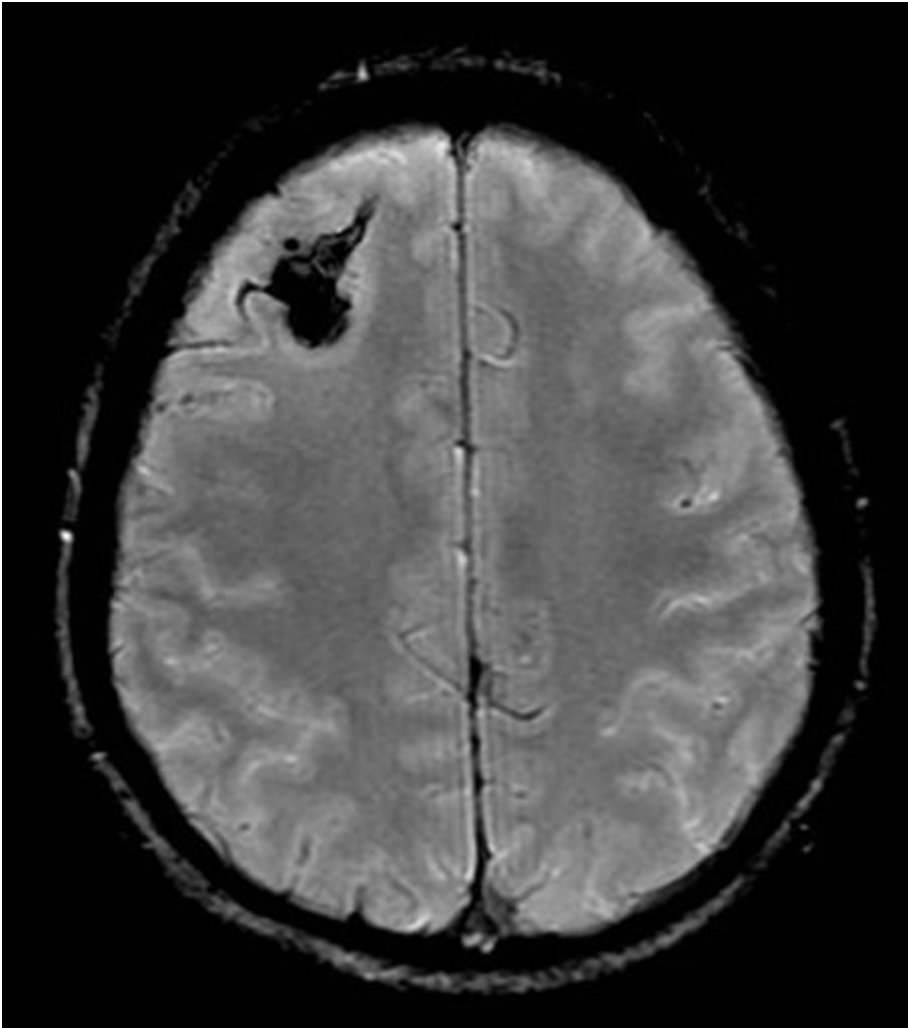
Figure 2

a



Description: T2/FLAIR coronal image showed a subarachnoid haemorrhage associated to a frontal parenchymal haematoma, characterised by hypointense signal, surrounded by hyperintense vasogenic oedema. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.

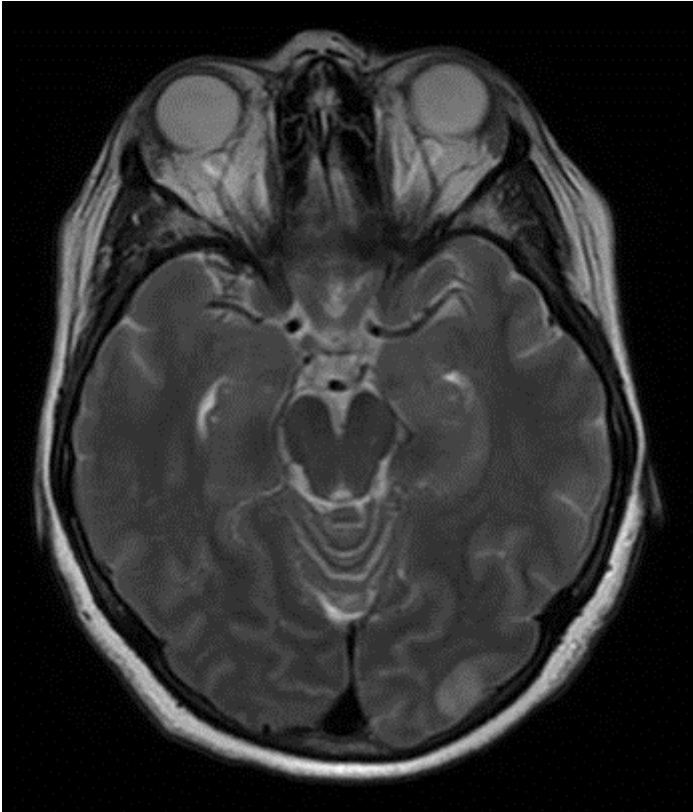
b



Description: T2*-weighted axial image showed a subarachnoid haemorrhage associated to a frontal parenchymal haematoma, characterised by hypointense signal. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.

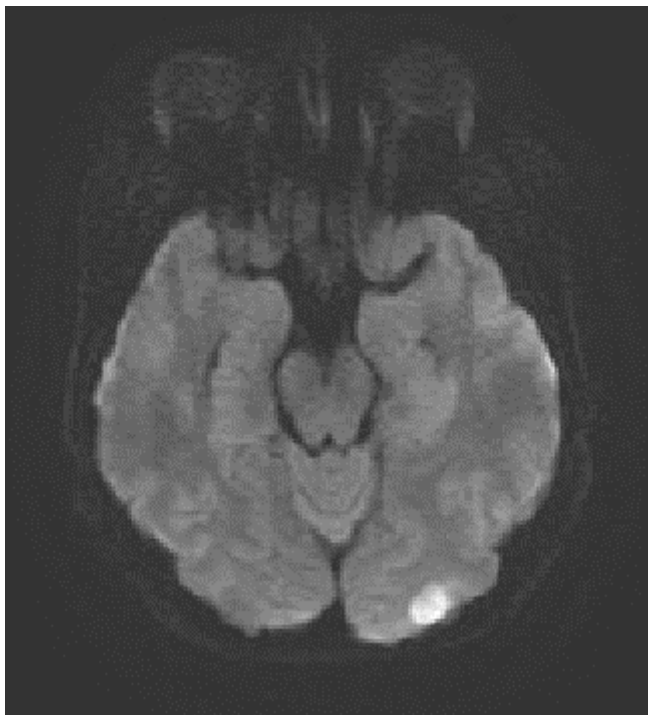
Figure 3

a



Description: T2-weighted axial image showed a small hyperintense focus on the left occipital lobe, corresponding to an acute infarct. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.

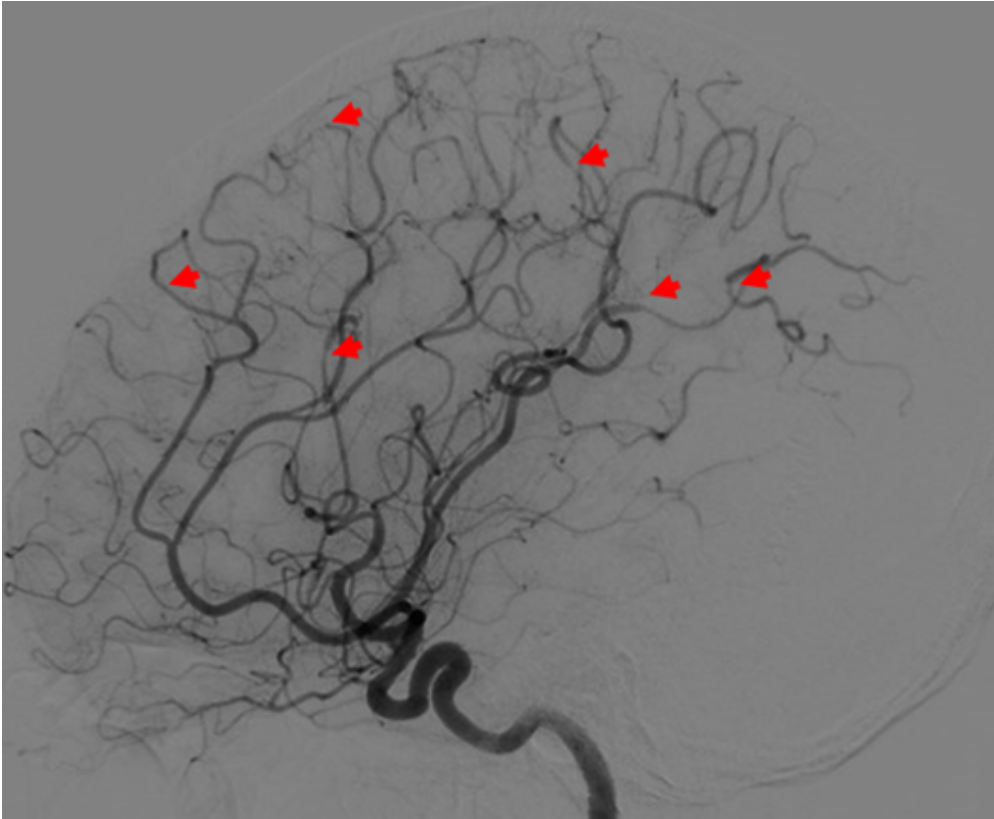
b



Description: DWI axial image showed a small hyperintense focus on the left occipital lobe, corresponding to an acute infarct. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.

Figure 4

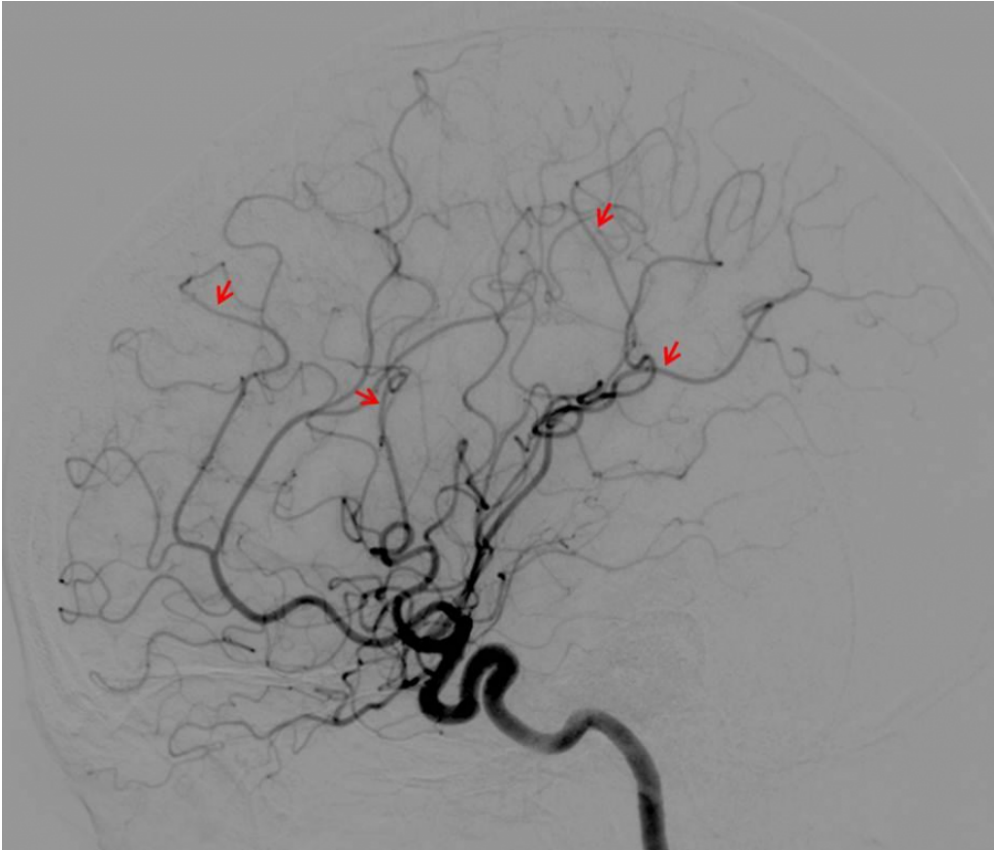
a



Description: Digital subtraction angiography demonstrated marked segmental vasoconstriction in multiple small and medium-calibre vessels in the territory of both middle cerebral arteries and both anterior cerebral arteries (red arrows). **Origin:** ACIM, Hospital Universitario y Politécnico la Fe, Valencia, Spain.

Figure 5

a



Description: Follow-up digital subtraction angiography showed a normalisation of the calibre of the vessels and of the contours of both carotid arteries. **Origin:** ACIM, Hospital Universitario y Politécnico La Fe, Valencia, Spain.