

Case Report

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In infectious endocarditis, a lesion can hide another one

Monique Boukobza^{1*}; Emilallic Habensus²; Jean Pierre Laissy³

¹Department of Radiology, Bichat Hospital, 46 rue Henri Huchard, 75018, Paris, Assistance Publique-Hôpitaux de Paris, France.

²Clinical Investigation Center, Assistance Publique-Hôpitaux de Paris, Bichat Claude-Bernard, Hospital, 46 rue Henri Huchard, 75018, Paris, France.

³Department of Radiology, Bichat Hospital, Assistance Publique-Hôpitaux de Paris, Paris, France ; INSERM U1148, Paris, France; Paris University, France.

*Corresponding Author: Monique Boukobza

Department of Radiology, Assistance Publique-Hôpitaux de Paris, Bichat Hospital, 46 rue Henri Huchard, 75018, Paris, France.

Tel: +33 6 24 65 29 32, Fax: +33 1 40 25 83 05;

Email: m.boukobza@orange.fr.

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Abstract

A 24-year-old immune-competent man, with no significant past medical history, presented a *Streptococcus viridans* Infective Endocarditis (IE). Work-up for IE showed on post-contrast brain CT-scan a ring-enhancing lesion suggesting a cerebral abscess, with a contiguous nodular enhancing lesion. Given this radiological aspect, and because immediate cardiac surgery was indicated, a cerebral angiography was performed, which exhibited an Intracranial Aneurysm (IA) of a distal branch of the left middle cerebral artery. The association of an IIA and a brain abscess is even rare in IE-patients and IIAs can be completely silent.

The interest of the current case is in its unusual radiological presentation. Faced to unusual cerebral imaging findings in IE context, an IIA must be considered and a vascular imaging must be performed urgently, initially by non-invasive methods.

Keywords: Infective endocarditis; Infectious intracranial aneurysm; Brain abscess; Ring-enhancing brain lesion; Emergency; Cerebral angiography; Brain-CT.

Abbreviations: IE: Infectious Endocarditis; IA: Intracranial Aneurysm; IIA: Intracranial Infectious Aneurysm; BA: Brain Abscess.

Introduction

Neurological complications of Infective Endocarditis (IE) occur in 20-40% of cases, can be classified into the following categories: Encephalopathy, ischemic stroke, cerebral hemorrhage, intracranial infectious aneurysms, meningitis and brain abscess.

We report a rare presentation of 2 brain complications in the same IE-patient, whose appearance on brain-CT adds an extra diagnostic challenge

Case presentation

A 24-year-old immune-competent man, with no significant past medical history, presented to the emergency department with a 2-day history of headache and fever. At admission, the patient was febrile at 38.5°C. His blood pressure was 108/66 mm Hg. Physical examination and chest radiography was unremarkable. Blood tests showed leukocytosis ($15.6 \times 10^9/L$) and blood cultures were positive for *Streptococcus viridans*.

Transthoracic and transesophageal echocardiography revealed 13 mm mobile vegetation on a bicuspid aortic valve. IE

of dental origin was diagnosed and antibiotic treatment was started on. Post-contrast brain CT-scan showed a ring-enhancing lesion suggesting a cerebral abscess, with a contiguous nodular enhancing lesion (Figure 1a, arrow). Given this radiological aspect, and because immediate cardiac surgery was indicated, a cerebral angiography was performed (Figure 1b).

Cerebral angiography exhibited an infectious Intracranial Aneurysm (IIA) of a distal branch (M4) of the left middle cerebral artery (Figures 2a, 2b), which was successfully treated by glue embolization. The day after the patient underwent mechanic aortic valve replacement and mitral valve plasty. Brain and cardiac outcome was favourable.

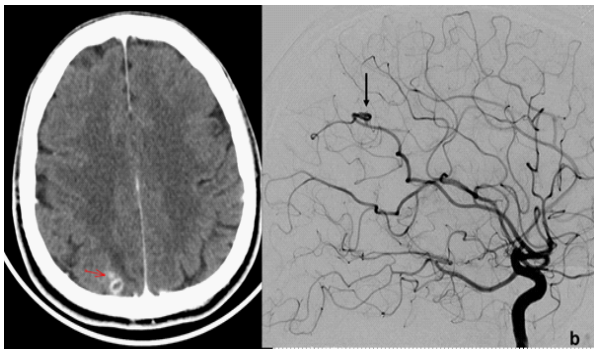


Figure 1a: Post-contrast brain CT shows a ring-enhanced lesion (2.0x1.5 cm) in the left parietal lobe, and a contiguous nodular enhancing lesion (2.5 mm) located anteriorly (arrow).

Figure 1b: Catheter cerebral angiography (lateral view, b, c, arrow; orthogonal view, d) shows an aneurysm.

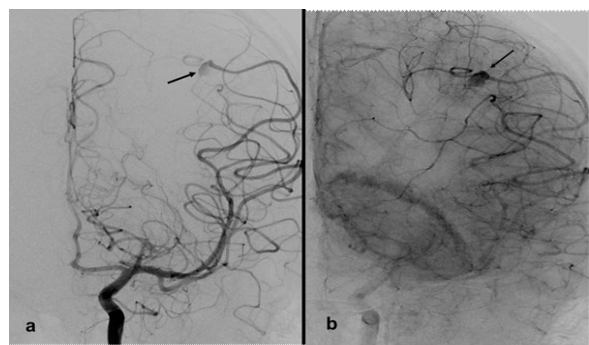


Figure 2: Catheter cerebral angiography (orthogonal view, a, arrow) shows an aneurysm. The maximal opacification is observed during a later phase (parenchymal phase) showing slow filling of the infectious aneurysm (b, arrow).

Discussion

Systemic septic emboli from vegetations complicate between 22 and 50% of cases of IE. Previous studies have shown that valve vegetation size (≥ 10 mm), location (mitral vs aortic) and mobility are associated with higher risk of embolic events [1]. The brain is the most frequent site of embolism in left-sided IE. These septic emboli are at the origin of brain ischemia (the most common complication) or hemorrhage, Brain Abscesses (BAs) and infectious aneurysms.

Symptomatic neurological complications (15–30% of patients) may be the presenting symptom [2,3]. These complications are associated with a high morbidity and mortality. Bacterial brain abscess is a rare complication of IE, affecting from 1% to 5% of patients [2]. Although a BA can present as a solitary

lesion like in our case, multiple ring-enhancing lesions are usually seen [2].

The reported frequency (2–4%) of IIAs in IE is probably underestimated, since they may be clinically silent and resolve under antibiotic therapy [4].

They are produced by inflammation and destruction of arterial walls and carry a high risk of rupture and hemorrhage. *Staphylococcus aureus* and *Streptococcus viridans* are the most frequent germs found in this context.

Their evolution is unpredictable: IIAs, whether silent or symptomatic, may rupture at any time during the course of the IE. Rapid onset and rupture and rapid growth of IIA during IE have been reported in a few cases [5]. The current case was due to *S. viridans* and the IIA was silent: the headaches were most likely related to the BA. IIAs diagnosis is challenging and cerebral angiography is the gold standard for diagnosis and monitoring, but is invasive. Many non-invasive imaging methods are widely utilized for the screening of IIAs (Brain angio-CT, MR angiography, contrast-enhanced MR angiography) but all these methods have limitations related to the size these IIAs, often very small- less than 3 mm in diameter- and very distally located on cerebral arteries. The association of an IIA and a brain abscess is even rare in IE-patients.

The interest of the current case is in its unusual radiological presentation: A ring-enhancing abscess with side by side a small round-shaped enhancing lesion, raises the question of the nature of this rounded lesion, and adds an extra diagnostic challenge. Given the IE context, these findings lead to rule out the diagnosis of unruptured IIA. This «signet-ring» aspect may be misinterpreted for a daughter-abscess.

Conclusion

Intracranial aneurysm in IE context may be silent and their association with a brain abscess is even rare.

Faced to unusual cerebral imaging findings in IE context, an IIA must be considered and a vascular imaging must be performed urgently, initially by non-invasive methods.

Declarations

Conflicts of interest: The authors declare that they have no conflicts of interest.

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