

A case of endocarditis with cerebral embolism successfully treated with daptomycin

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Abstract

A young girl was admitted for fever, headache, paresthesia of the hands, involuntary blinking of the left eye and aphasia. Imaging revealed mycotic cerebral aneurysms and finally infective endocarditis was diagnosed and successfully treated with daptomycin. She had a history of mitral prolapse and she had undergone dental procedures some months before without any antibiotic prophylaxis, according to the 2007 guidelines of the American Heart Association.

Case Report

A 26-year-old female was admitted to the Neurology Unit for fever, severe temporal, parietal and occipital headache, paresthesia of the hands and involuntary blinking of the left eye which had started 10 days before. A transient episode of aphasia was also reported.

The patient was a non smoker and was not taking any medication. Mitral prolapse with moderate insufficiency was detected when she was 8 years old. She had undergone dental procedures some months before without any antibiotic prophylaxis.

On physical examination a holosystolic murmur was heard.

The erythrocyte sedimentation rate and the C-reactive protein were slightly increased while the white blood count was normal. Haemoglobin was 9.8 g/dL.

A computed tomography scan detected two small areas of hyperintensity compatible with subarachnoid haemorrhage in the left parietal lobe; a smaller area with the same characteristics was detected in the right parietal lobe. Magnetic resonance imaging (MRI) and angiography revealed an irregular, nodular image of 4 mm with high flow, in the left parietal lobe, interpreted as a vascular malformation; two smaller areas with similar characteristics were observed in the left and the right parietal lobe. Angiography revealed three small aneurysmal dilatations along the course of the left paracen-

tral lobular artery, the left superior parietal artery and the left angular artery (Figure 1). Aneurysms were interpreted as possible mycotic aneurysms and an echocardiography was requested because infective endocarditis was suspected. A trans-thoracic ecocardiography confirmed the mitral prolapse with moderate insufficiency and revealed thickened mitral lemls. The patient was therefore transferred to the Infectious Diseases Unit. A trans-esophageal echocardiography revealed vegetation on the mitral valve suggesting infective endocarditis. A Tc-99m leukocyte scintigraphy demonstrated accumulation on the mitral valve. Areas of focal accumulation in the brain were also observed. One single blood culture resulted positive for methicillin resistant *Staphylococcus epidermidis*. Treatment with IV 500 mg daptomycin was given for six weeks. Therapeutic drug monitoring was conducted and daptomycin resulted in the therapeutic range. A follow up cerebral angiography showed complete resolution of the aneurysms. A follow up trans-esophageal ecocardiography documented remarkable reduction of the thickness of the lemls of the mitral valve and an improvement of the mitral regurgitation. A follow up MRI of the brain showed hemosiderin deposits as a result of bleeding. A follow up scintigraphy showed the resolution of the accumulation on the mitral valve and at brain level. Valvular replacement was planned.

Discussion

According to the most recent guidelines of the American Heart Association, issued in 2007, antibiotic prophylaxis is no longer indicated in patients with mitral prolapse undergoing dental procedures, as it was in the previous edition.¹ This decision has been criticized by some authors who reported cases of infective endocarditis occurring in patients with such a cardiac defect and undergoing dental procedures without any prophylaxis.^{2,3} Though infective endocarditis in these patients cannot be attributed to dental procedures for sure, we believe a more prudent approach should be considered. The diagnosis of endocarditis is based on the Duke criteria.⁴ In our case, the following occurred: one major criteria (major echocardiographic findings) and four minor criteria (fever, embolism, predisposing heart condition and minor microbiological criteria). Positive leukocyte scintigraphy is not included in the Duke criteria; however, in our case, it was consistent with the diagnosis of endocarditis with cerebral embolism. Some data suggests scintigraphy is of little value in the evaluation of patients with suspected endocarditis, since vegetations consist mainly of masses of fibrin, clotted platelets, blood cell debris, bacteria and only a few leuko-

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cytes.⁵ Other studies suggest a positive granulocyte scan correlates with high activity of the inflammatory process and predicts a poor prognosis for the patients concerned.⁶ Probably, more evidence is needed to define the role of scintigraphy in the diagnosis of infective endocarditis.

Indications for therapy with daptomycin approved by the FDA include *Staphylococcus aureus* bloodstream infections including right-sided endocarditis⁷ and daptomycin is also considered as an alternative option for the empirical treatment of endocarditis on native valves and the treatment of endocarditis due to Gram positive bacteria⁸. Daptomycin is not generally recommended for infections of the central nervous system since there is no adequate evidence on its penetration in the cerebral parenchyma and the cerebrospinal fluid. However, in our case, we considered cerebral mycotic aneurysms as caused by the infection of the vascular side of the wall of the vessels. Our report suggests that daptomycin is safe and effective in case of left endocarditis with cerebral embolism.



Figure 1. Brain angiography showing mycotic aneurysms due to septic embolism.

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