

# Fatal Outcome of a Cerebral Mycotic Aneurysm in the Context of Infective Endocarditis

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## Abstract

Cerebral mycotic aneurysms are rare complications of infective endocarditis, occurring in approximately 2% - 3% of cases, often asymptomatic and underdiagnosed. This report describes the case of an 80-year-old female with infective endocarditis caused by *Enterococcus faecalis*, who developed a cerebral mycotic aneurysm complicated by rupture, leading to a fatal outcome. Despite appropriate antibiotic treatment and clinical support, the progression was unfavorable, highlighting the severity of this complication. The case underscores the importance of early diagnosis and multidisciplinary management in high-risk patients.

## Keywords

Cerebral Mycotic Aneurysm, Infective Endocarditis, Intracranial Hemorrhage, Septic Embolism, *Enterococcus faecalis*

## 1. Introduction

Infective endocarditis (IE) is a serious condition with significant morbidity and mortality, often complicated by neurological manifestations in up to 20% of cases [1] [2]. Among these, cerebral mycotic aneurysms (CMA) are rare but carry a high risk of fatal outcomes, with an estimated incidence of 2% - 3% [3] [4]. These aneurysms arise from septic embolization, leading to focal infection and progressive weakening of the arterial wall, most commonly caused by *Staphylococcus aureus* or *Enterococcus faecalis* [5].

Several risk factors increase the likelihood of developing mycotic aneurysms. Advanced age, immunosuppression, and the presence of comorbidities such as diabetes mellitus, hypertension, and chronic renal failure are significant contributors [6] [7]. Additionally, the type of pathogen plays a crucial role, with *Staphy-*

*Staphylococcus aureus* and *Enterococcus faecalis* being particularly associated with higher risk due to persistent bacteremia [5] [8]. Patients with left-sided infective endocarditis, valvular prostheses, or a history of previous endocarditis are also at elevated risk [2] [4] [8]. The use of intravenous drugs and long-term intravascular devices further predisposes patients to these complications [1] [9].

Clinically, CMA may remain asymptomatic or present with non-specific symptoms such as headache or altered mental status, complicating early diagnosis. Angio-CT and MRI with contrast are crucial for initial evaluation, while digital subtraction angiography remains the gold standard for definitive diagnosis [6] [10]. Management involves prolonged targeted antibiotic therapy, often combined with surgical or endovascular intervention in cases of large or ruptured aneurysms. The prognosis remains poor in cases of rupture, with reported mortality rates as high as 80% despite aggressive treatment [6] [10]. This case highlights the importance of early diagnosis and a multidisciplinary approach in managing CMA in high-risk patients, particularly those with multiple comorbidities.

## 2. Case Description

An 80-year-old female patient presented with intermittent fever and productive cough lasting for two weeks. Her medical history included hypertension, type 2 *diabetes mellitus*, grade 2 obesity, atrial fibrillation on novel oral anticoagulants, and aortic valve replacement with a bioprosthesis in 2020 for severe aortic stenosis. She was initially diagnosed with acute tracheobronchitis and treated empirically with amoxicillin-clavulanate.

Upon re-evaluation in the emergency department, she reported persistent fever but no additional symptoms such as headache, neurological deficits, or weight loss. The differential diagnosis included recurrent respiratory infection, infective endocarditis, and malignancy. Initial laboratory tests showed elevated C-reactive protein (93.4 mg/L) without leukocytosis or neutrophilia. Chest-abdomen-pelvis CT and non-contrast cranial CT scans were unremarkable.

A transthoracic echocardiogram didn't show definitive signs of infective endocarditis. However, transesophageal echocardiography revealed two masses attached to the aortic prosthesis, consistent with vegetations, confirming the diagnosis of acute infective endocarditis.

## 3. Antibiotic Regimen

Empirical treatment with ceftriaxone (2 g every 12 hours, IV), ampicillin (2g every 4 hours, IV), and gentamicin (3 mg/kg/day, divided doses) was initiated. After blood cultures confirmed *Enterococcus faecalis*, gentamicin was discontinued, and the patient remained on a combination of ampicillin (2 g every 4 hours) and ceftriaxone (2 g every 12 hours) for targeted therapy. Clinical improvement was noted during the first seven days.

On the seventh day, the patient developed sudden altered consciousness and was found to have a large right hemispheric hematoma on cranial CT. The hem-

orrhage was of extra-axial origin, with blood filling the pentagonal and ambient cisterns. Angio-CT identified an aneurysmal ectasia at the M1/M2 transition of the right middle cerebral artery, measuring approximately 8 mm in diameter. Despite neurosurgical consultation, surgical intervention was deemed unfeasible due to the extent of the hemorrhage and the patient's clinical deterioration. Supportive care was provided, but the patient succumbed eight hours later.

#### 4. Discussion

Cerebral mycotic aneurysms are rare but severe complications of infective endocarditis. The pathogenesis involves direct infection of the arterial wall following septic embolization, often associated with pathogens such as *Staphylococcus aureus* or *Enterococcus faecalis*. Many aneurysms remain asymptomatic, but rupture is catastrophic, with high mortality rates [7].

Early diagnosis requires a high clinical suspicion and the use of imaging such as angio-CT or contrast-enhanced MRI. Management includes prolonged antibiotic therapy and, in selected cases, surgical or endovascular intervention [8] [11]. In this case, advanced age, comorbidities, and the severity of the hemorrhage limited therapeutic options. This case highlights the need for rigorous monitoring of neurological complications in patients with infective endocarditis, particularly in the presence of *Enterococcus faecalis*. The unfavorable outcome underscores the importance of multidisciplinary management and the early identification of mycotic aneurysms before rupture [6] [8].

Cerebral mycotic aneurysms are rare but devastating complications of infective endocarditis. This report emphasizes the importance of early diagnostic approaches, strict monitoring, and multidisciplinary evaluation in managing this condition. Case reports like this contribute to the growing clinical knowledge of these severe complications.

#### 5. Key Points

- **Rare Complication:** Cerebral mycotic aneurysms are uncommon but severe complications of infective endocarditis, with an incidence of 2% - 3%.
- **High Mortality:** Rupture of these aneurysms carries a poor prognosis, with mortality rates ranging from 60% - 90%.
- **Pathogenesis:** The condition arises from direct infection of arterial walls due to septic embolization, often linked to pathogens like *Enterococcus faecalis*.
- **Diagnostic Challenge:** Early detection relies on high clinical suspicion and advanced imaging techniques such as angio-CT or MRI.
- **Management:** Treatment includes prolonged antibiotic therapy and, in some cases, surgical or endovascular intervention. Advanced age and comorbidities may limit therapeutic options.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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