Case Report

Cerebral Hemorrhage as a Presenting Feature of Infective Endocarditis

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This case report describes a rare and fatal presentation of infective endocarditis (IE) initially manifesting as intracerebral hemorrhage due to a ruptured mycotic aneurysm. A 50-year-old man with atrial fibrillation presented with headache, fever, confusion, and hemiparesis. Brain imaging revealed left-sided hemorrhage, and echocardiography identified a mitral valve vegetation. Blood cultures grew Staphylococcus xylosus, a coagulase-negative staphylococcus. Despite empiric treatment with vancomycin and gentamicin, the patient's clinical status deteriorated with the onset of severe pulmonary edema and acute mitral regurgitation. Surgical intervention was indicated but could not be performed before the patient suffered a fatal cardiorespiratory arrest. This study underscores the diagnostic complexity and therapeutic dilemma in managing IE complicated by intracranial hemorrhage. It highlights the need for early multidisciplinary collaboration, careful risk–benefit assessment for cardiac surgery in the setting of recent cerebral bleeding, and vigilance for neurological complications in febrile patients with predisposing cardiac conditions.

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Introduction

"Infective endocarditis (IE) is associated with significant morbidity and mortality [1], with in-hospital mortality rates ranging from 15% to 30% [2] and one-year mortality approaching 40% in some populations [3]. The epidemiology of IE has evolved considerably over recent decades [4], with increasing prevalence among elderly patients and those with healthcare-associated infections [5]. Staphylococcus aureus has emerged as the predominant causative pathogen in developed countries, surpassing

streptococcal species [6], while the proportion of cases related to rheumatic heart disease has declined in high-income regions but remains significant globally [7].

Diagnosis remains challenging and often delayed, requiring a multidisciplinary approach integrating clinical, microbiological, and imaging modalities [8]. Echocardiography plays a central role, with transesophageal techniques offering superior sensitivity for detecting vegetations and perivalvular complications [9]. Recent advances in imaging, including cardiac CT, PET/CT, and cardiac MRI, have improved diagnostic accuracy, particularly in prosthetic valve endocarditis and cardiac device-related infections [10].

Treatment typically involves prolonged antimicrobial therapy, with surgical intervention required in approximately 50% of cases [11]. The timing of surgery remains controversial, though evidence increasingly supports early surgical intervention in cases with severe valvular dysfunction, large vegetations, or uncontrolled infection [12]."

We report a case of a patient admitted for cerebral hemorrhage secondary to an infective endocarditis

Case Presentation

A 50-year-old man with atrial fibrillation presented to the emergency department with a two-day history of diffuse headache. Physical examination revealed a fever of 40°C with stable hemodynamic and respiratory parameters. Neurological examination showed a Glasgow Coma Scale (GCS) score of 14/15, confusion, and right-sided hemiparesis. Brain CT revealed left cerebral hemorrhage **(Figure 1)**. Chest X-ray ruled out suspected right basal pneumonia, and abdominal-pelvic CT showed no abnormalities.

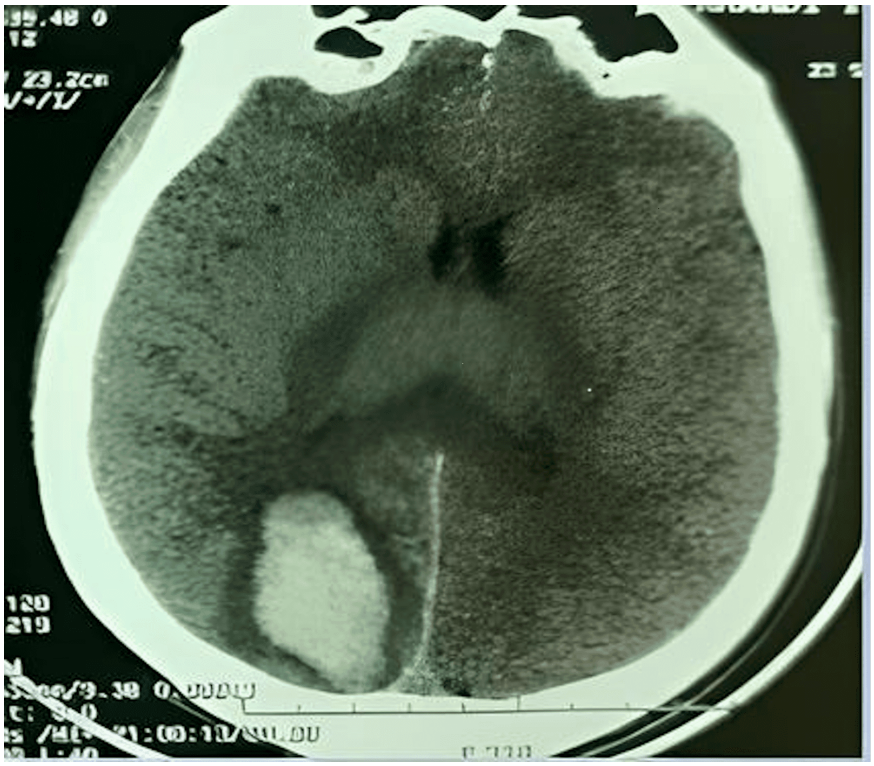

Figure 1. Brain computed tomography scan revealing left parietooccipital acute hemorrhage with perilesional edema

Transthoracic echocardiography identified a probable 11 mm mitral valve vegetation **(Figure 2)**. Transesophageal echocardiography was not performed due to technical limitations. Laboratory tests showed elevated white blood cell count (18,000/mm^3), thrombocytopenia (28,000/mm^3), and markedly elevated C-reactive protein (>320 mg/L). Blood cultures grew coagulase-negative Staphylococcus xylosus.

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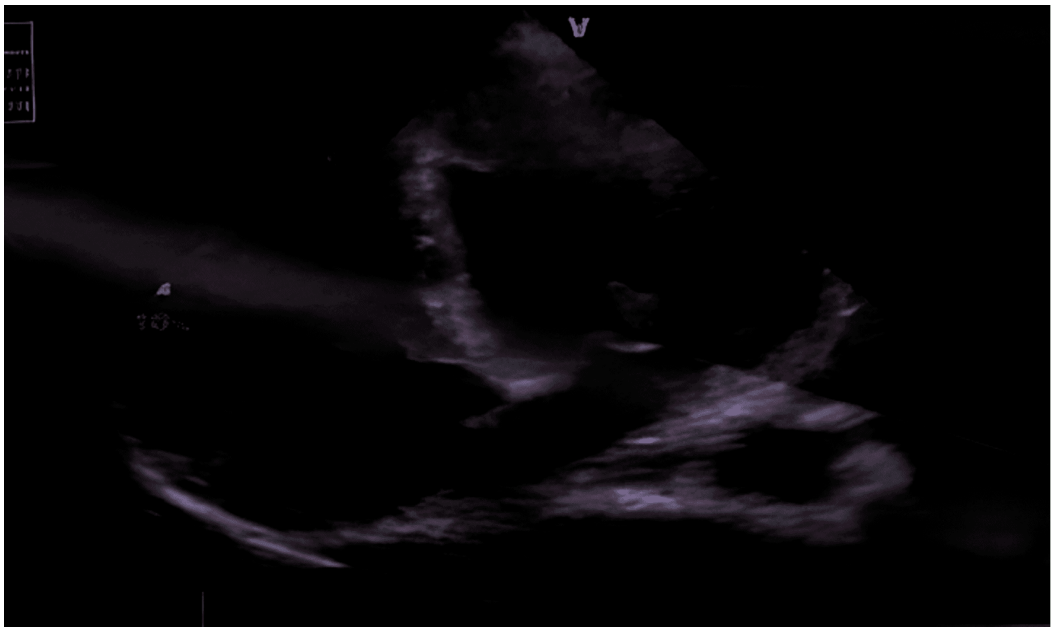

Figure 2. Apical four-chamber transthoracic echocardiography (TTE) showing a vegetation attached to the mitral valve

The presentation was consistent with cerebral hemorrhage due to mycotic aneurysm rupture complicating infective endocarditis. The patient was admitted to intensive care and treated with vancomycin (30 mg/kg/day) and gentamicin (3 mg/kg/day), with measures to prevent systemic brain injury. The patient's course was marked by persistent fever despite vancomycin therapy and progressive deterioration of consciousness.

On day six in ICU, the patient developed severe pulmonary edema **(Figure 3)** requiring mechanical ventilation and diuretics. Subsequent difficulty weaning from mechanical ventilation due to recurrent pulmonary edema prompted a second transthoracic echocardiogram, which revealed mitral valve prolapse with significant valve thickening, a probable 15 mm vegetation, and acute massive mitral regurgitation. Mitral valve replacement was indicated.the patient unfortunately present a cardiorespiratory arrest due to hypoxia that was refractory to treatment.

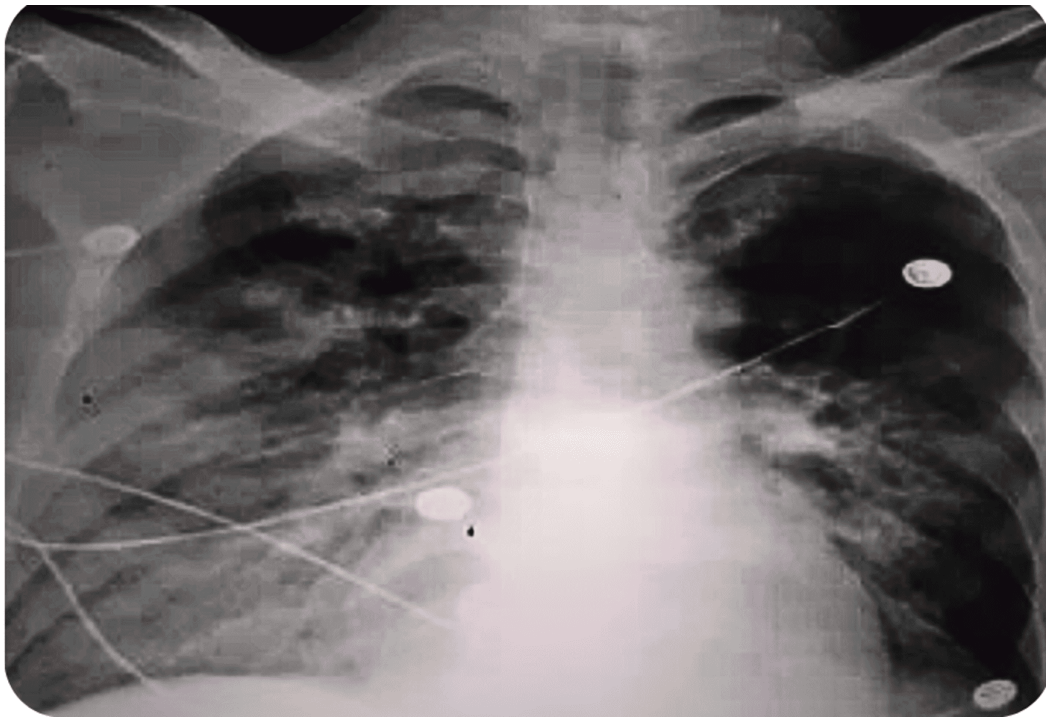

Figure 3. Chest X-ray showing pulmonary oedema

Discussion

This case presents a complex case of infective endocarditis complicated by intracranial hemorrhage in a 50-year-old patient with underlying atrial fibrillation. The presentation with fever, neurological deficits, and cerebral hemorrhage initially posed diagnostic challenges, as the combination of these findings required careful consideration of multiple etiologies. The patient's presentation with diffuse headache, high fever (40°C), confusion, and right-sided hemiparesis, combined with the finding of left cerebral hemorrhage on CT, strongly suggested a neurological complication of systemic infection. The preserved hemodynamic stability initially was somewhat reassuring but did not exclude serious underlying pathology.

The cerebral hemorrhage was attributed to mycotic aneurysm rupture, a well-recognized complication of infective endocarditis occurring in 2-5% of cases. These aneurysms form due to septic emboli causing arterial wall infection and subsequent weakening, leading to dilatation and potential rupture [1][2][3][4][5].

The choice of vancomycin and gentamicin was appropriate for coagulase-negative staphylococcal endocarditis. However, the persistent fever despite therapy raised concerns about inadequate source

control, ongoing embolic phenomena and the need for surgical intervention[1][6].

The case highlights the challenging decision-making regarding surgical intervention in endocarditis complicated by intracranial hemorrhage [4]. While mitral valve replacement was indicated due to acute massive regurgitation, the timing was complicated by recent cerebral hemorrhage (traditional contraindication to cardiopulmonary bypass), progressive hemodynamic deterioration and the need to balance bleeding risk (curative anticoagulation) versus hemodynamic collapse[7][8][9]

The development of pulmonary edema and requirement for mechanical ventilation reflected the hemodynamic consequences of acute mitral regurgitation [7][10].

This case emphasizes the importance of maintaining high clinical suspicion for infective endocarditis in patients presenting with fever and neurological symptoms, particularly those with predisposing cardiac conditions[4][11].

Management required multidisciplinary approach and coordination between emergency medicine for initial stabilization, cardiology for valve assessment and management, neurology/neurosurgery for intracranial hemorrhage, infectious diseases for antimicrobial selection, cardiac surgery for definitive valve intervention and critical care for overall management [12][13]

The combination of intracranial hemorrhage, acute valve regurgitation, and delayed surgical intervention created a scenario with limited therapeutic options and poor prognosis[14][15].

Conclusion

This case illustrates the complex interplay between infective endocarditis and its neurological complications. The management of such cases requires rapid diagnosis, appropriate antimicrobial therapy, and careful consideration of surgical timing. The presence of intracranial hemorrhage significantly complicates management decisions and leads to poor prognosis. Early recognition and multidisciplinary care remain essential for optimizing outcomes in these challenging cases, though mortality remains high despite appropriate treatment.

Statements and Declarations

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Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ethics

Written informed consent was obtained from the next-of-kin of the participant for the publication of this case report and any accompanying images. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. As this is a report of a single case, formal ethics committee approval was not required by our institution's policy.

Data Availability

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

Reporting Guidelines

This case report was prepared in accordance with the CARE (Case Report) guidelines.

Author Contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Declarations

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