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Selected Topics: Neurological Emergencies

INFECTIVE ENDOCARDITIS PRESENTING WITH INTRACRANIAL BLEEDING

Andrea Morotti, MD,* Massimo Gamba, MD,† Paolo Costa, MD,* Loris Poli, MD,* Nicola Gilberti, MD,† Ilenia Delrio, MD,† Dikran Mardighian, MD,‡ Roberto Gasparotti, MD,‡ Alessandro Padovani, MD, PHD,* and Alessandro Pezzini, MD*

*Dipartimento di Scienze Cliniche e Sperimentali, Clinica Neurologica, Università degli Studi di Brescia, Brescia, Italy, †Dipartimento di Scienze Neurologiche e della Visione, Neurologia Vascolare, Spedali Civili di Brescia, Brescia, Italy, and ‡Dipartimento di Diagnostica per Immagini, Neuroradiologia, Università degli Studi di Brescia, Brescia, Italy

Corresponding Address: Andrea Morotti, MD, Dipartimento di Scienze Cliniche e Sperimentali, Clinica Neurologica, Università degli Studi di Brescia, Piazzale Spedali Civili 1, 25123 Brescia, Italy

☐ **Abstract—Background: Infective endocarditis (IE) can be complicated by intracranial bleeding (ICB) caused by different pathologic mechanisms. The occurrence of ICB in patients with IE significantly influences therapeutic decisions and has a negative impact on outcome. Case Report: We describe the clinical courses of 3 patients with aortic prosthetic valve IE presenting with ICB. Patients 1 and 2 experienced subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH), respectively, caused by rupture of an intracranial infectious aneurysm (IIA). Both underwent endovascular treatment of IIA with good outcome. In patient 3, ICB was the hemorrhagic conversion of an acute ischemic lesion from septic brain embolization. In the subacute phase of the disease, aortic valve replacement was performed, with excellent outcome. Why Should an Emergency Physician be Aware of This?: ICB is a relevant complication and sometimes the first clinical feature of IE. Imaging of brain vessels should be performed to investigate the pathologic mechanism underlying ICB. The prevalence of IIA is probably underestimated and may influence the therapeutic strategy. Cerebrovascular imaging may therefore also be considered in asymptomatic subjects with left-sided IE. Withdrawal of anticoagulant treatment and delay of cardiac surgery are recommended in all cases of IE complicated by ICB. Because of the impact of ICB on IE management and outcome, a high level of clinical suspicion and prompt recognition and treatment of this complication are necessary.**

☐ **Keywords—infectious aneurysm; infective endocarditis; intracerebral hemorrhage; subarachnoid hemorrhage**

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INTRODUCTION

Up to 40% of patients with infective endocarditis (IE) develop central nervous system involvement (1). Stroke is the most frequent neurologic complication of IE and the main cause of death after heart failure; it usually occurs in the early phase of the disease and in >50% of these patients represents the presenting symptom (2–4). In particular, intracranial bleeding (ICB) accounts for 30% of neurologic complications and has a negative impact on IE prognosis (1,5). Several mechanisms explain the occurrence of ICB in patients with IE (6). We describe 3 cases of IE presenting with different types of ICB.

CASE REPORTS

Patient 1

A 35-year-old man on oral anticoagulant therapy (OAT) for a mechanical prosthetic aortic valve presented with a thunderclap headache after a 3-day fever.

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Neuroimaging revealed a subarachnoid hemorrhage (SAH; Figure 1A) from a ruptured right pericallosal aneurysm and an unruptured aneurysm of the middle cerebral artery (MCA; Figure 1C). Laboratory findings revealed an elevated C-reactive protein level (457 nmol/L [normal, 0–48 nmol/L]) and *Enterococcus faecalis* was isolated from blood cultures. Prosthetic valve vegetation was identified on transesophageal echocardiography (TEE; Figure 1B) and a diagnosis of IE was made. OAT was promptly discontinued and the patient had good recovery after treatment of the ruptured aneurysm by endovascular occlusion of the parental artery (Figure 1D) and antibiotic therapy. Three months postdischarge, despite appropriate prolonged antimicrobial treatment, the unruptured aneurysm of the distal right MCA was unchanged. Therefore, the patient underwent endovascular treatment by glue embolization of the parental artery (Figure 1E), with excellent outcome.

Patient 2

A 60-year-old man was admitted to our division for a right parieto-occipital intracerebral hemorrhage (ICH; Figure 2A). His vital signs and a general examination were unremarkable except for fever with chills. The patient's medical history was significant for the presence of a mechanical prosthetic aortic valve and OAT. Cerebral computed tomography angiography (CTA) and subsequent digital subtraction angiography (DSA) revealed the presence of an intracranial infectious aneurysm (IIA) originating from the right calcarine artery (Figure 2B–D), located at the base of the hematoma. IE

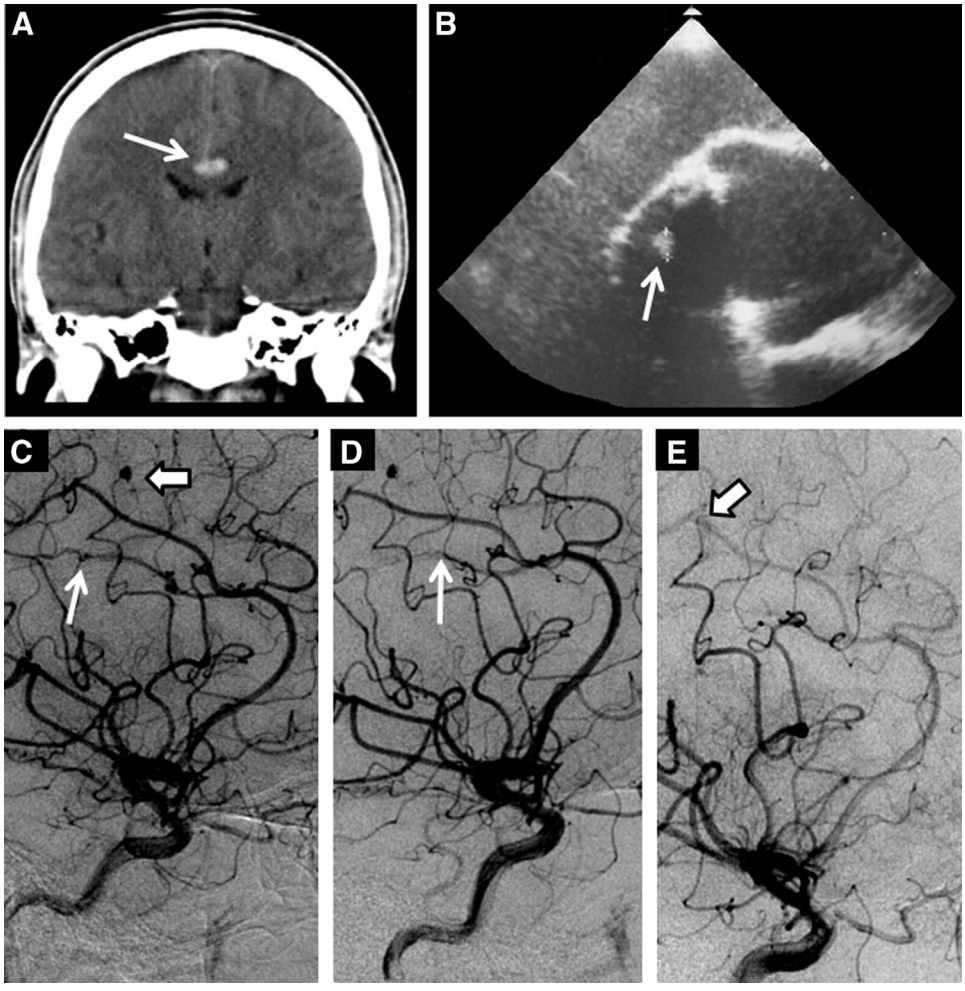

Figure 1. Coronal computed tomography scan of the brain showing subarachnoid hemorrhage in the supracallosal cistern (arrow, A) and transesophageal echocardiography with evidence of vegetation over the mechanical prosthetic aortic valve (arrow, B). Digital subtraction cerebral angiography revealing a ruptured aneurysm of the right pericallosal artery (thin arrow, C) and an aneurysm in the M4 division of the right middle cerebral artery (thick arrow, C). Digital subtraction cerebral angiography showing treatment of the infectious aneurysms with endovascular glue embolization of the parental artery (thin arrow, D and thick arrow, E).