CASE REPORT

Mycotic aneurysm: a rare and dreaded complication of infective endocarditis

Vivek Singla, Rajni Sharma, A C Nagamani, Cholenahally Nanjappa Manjunath

Department of Cardiology,
Sri Jayadeva Institute of
Cardiovascular Sciences and
Research, Bangalore,
Karnataka, India

Correspondence to
Dr Vivek Singla,
drviveksingla98@gmail.com

SUMMARY

Mycotic cerebral aneurysm is a rare and potentially fatal complication of infective endocarditis. A young man was diagnosed with culture negative infective endocarditis of mitral valve with cerebral aneurysm. The patient was started on conservative management, but he died owing to intracerebral haemorrhage. In the absence of large randomised trials, there is a lack of consensus regarding the management of unruptured aneurysms. Since mycotic aneurysms are known to resolve or decrease in size with antimicrobial therapy, several institutions advise the conservative approach. A few case reports like the present case have shown that the risk of aneurysmal rupture and death is considerably high with the conservative approach. Endovascular therapy has shown to reduce the mortality in this subgroup. These patients should be managed aggressively with endovascular or surgical procedure along with antimicrobial therapy.

BACKGROUND

Mycotic cerebral aneurysm (MA) is a rare complication of infective endocarditis, and is associated with high morbidity and mortality due to subarachnoid and intracerebral haemorrhage. The treatment of the unruptured aneurysm is debatable, as several institutions recommend antimicrobial therapy along with follow-up.¹ We report a young man presented with infective endocarditis and a cerebral mycotic aneurysm. The patient was started on conservative management, but he died due to intracerebral haemorrhage. We recommend a more aggressive approach to manage such patients.

CASE PRESENTATION

A 27-year-old man presented with high grade fever with chills, dyspnoea on exertion (The New York Heart Association (NYHA) III) and palpitations (NYHA II) of 15 days duration. On examination, he was febrile (102°F). The pulse rate was regular (106/min) and blood pressure was 100/80 mm Hg. Cardiac auscultation revealed soft first heart sound, normal aortic component and loud pulmonary component of second sound, a grade 3/6 pansystolic murmur at apex radiating to axilla and S3 gallop rhythm.

INVESTIGATIONS

Haemogram revealed leucocytosis (13 000/mm³) with predominant neutrophilia (76%) and normal platelet count (4.29 lakhs/mm³). Urine examination, renal function test and liver function test were normal. Transthoracic echocardiogram revealed an abscess (1.1×0.9 cm) at anterior mitral

leaflet with perforation leading to severe mitral regurgitation with two jets (figure 1). Blood cultures (four samples) were negative after 48 h.

TREATMENT

The patient was treated with anti-failure medications along with injectable antibiotics for infective endocarditis.

OUTCOME AND FOLLOW-UP

On day 3, the patient developed persistent headache. There was no neurological deficit. The CT angiogram of cranial arteries showed an aneurysm of left anterior cerebral artery (figure 2). The patient was continued on antibiotics with close monitoring for neurological symptoms. The patient became afebrile and the symptoms leading to heart failure improved with the medical therapy. On day 8, the patient developed right-sided hemiplegia and died on the same day.

DISCUSSION

The management of infective endocarditis is challenging, as the 1 year mortality is approximately 30%. Neurological complications, most commonly cerebral embolism, are seen in 20–40% of the patients and are associated with high morbidity and mortality.¹ The reported incidence of mycotic cerebral aneurysms is 2–3% of all the patients with infective endocarditis.² This is possibly underestimated, because majority of the patients remain asymptomatic and the aneurysm may resolve after antibiotic therapy. Mycotic aneurysm is an ominous finding with high mortality rates ranging from 30% in untreated unruptured to 80% in case of rupture.² The MAs are most common in anterior circulation. The pathogenesis is best explained by 'vasa vasorum theory' which states that the microorganisms from the embolic vegetation escape through the vasa vasorum and cause severe adventitial inflammation and damage.³ The usual presenting symptoms include headache (83%), fever (67%), vomiting (50%), ocular palsy (25%), seizures (21%), behavioural changes (21%), hemiparesis (21%), drowsiness (17%) and loss of consciousness (17%).⁴

The management of the unruptured MA is controversial owing to absence of randomised controlled trials and consensus guidelines. The available options include conservative (antimicrobial therapy with monitoring), endovascular therapy and surgical therapy. Recent guidelines have advised serial imaging for unruptured MA and recommended the invasive procedures for very

To cite: Singla V, Sharma R, Nagamani AC, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-200016

Figure 1 Transthoracic echocardiogram showing two jets of mitral regurgitation in apical—four-chamber view (A) and abscess at the anterior mitral leaflet in parasternal long axis view (B).

large, enlarging or ruptured aneurysm.⁵ Another consideration is regarding the timing of the aneurysmal repair and cardiac valve surgery. There is concern regarding worsening of the neurological status owing to anticoagulation and cardiopulmonary bypass. Several authors have recommended the antimicrobial therapy along with close follow-up as the first line of treatment for unruptured intracranial aneurysms.¹ The mycotic aneurysms may resolve or decrease in size with appropriate antibiotics; however, it is not possible to predict the response. In the present case, as the aneurysm ruptured within 5 days, we did not repeat the imaging to look for the size of the aneurysm.

Endovascular treatment for intracranial mycotic aneurysms has recently been developed and has shown good results. The studies have shown better survival with early endovascular repair as compared with conservative approach.¹ The various factors associated with high risk of rupture are not elucidated

owing to the rarity of the condition. Endovascular therapy is potentially safer and more effective than open craniotomy if performed by experienced operator in the absence of raised intracranial pressure, hypotension, haematoma or involvement of eloquent territory.³ In these cases, surgery is a preferred choice.

In the present case, the symptoms leading to heart failure had improved with the medical therapy, and the MA repair might have changed the outcome. This report highlights the drawbacks of the recommended conservative approach.

In conclusion, MAs are rare but a dreaded complication of infective endocarditis with very high mortality rates. The management of infective endocarditis associated with the mycotic aneurysm is challenging. The unruptured MA should be managed aggressively with aneurysmal repair, surgical or endovascular, along with the antimicrobial therapy.

Figure 2 (A–C) CT angiography of cerebral vessels showing an aneurysm in anterior circulation.

Learning points

- ▶ Neurological complications (most common embolism) seen in up to 40% patients with infective endocarditis.
- ▶ Mycotic aneurysm is a rare but dreaded complication.
- ▶ Mycotic aneurysm may decrease and resolve with antimicrobial therapy.
- ▶ Endovascular therapy has shown survival benefit over conservative therapy.
- ▶ Mycotic aneurysms should be aggressively managed with endovascular therapy in addition to antimicrobial therapy.

Contributors VS and RS were involved in conception, design, analysis and drafting of the manuscript. NAC and CNM critically reviewed important intellectual content and made the final approval.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Fukuda W, Daitoku K, Minakawa M, *et al.* Infective endocarditis with cerebrovascular complications: timing of surgical intervention. *Interact Cardiovasc Thorac Surg* 2012;14:26–30.
- 2 Oohara K, Yamazaki T, Kanou H, *et al.* Infective endocarditis complicated by mycotic cerebral aneurysm: two case reports of women in the peripartum period. *Eur J Cardiothorac Surg* 1998;14:533–5.
- 3 Kuo I, Long T, Nguyen N. Ruptured intracranial mycotic aneurysm in infective endocarditis: a natural history. *Case Rep Med* 2010;2010:168408.
- 4 Kannoth S, Iyer R, Thomas SV, *et al.* Intracranial infections aneurysm: presentation, management and outcome. *J Neurol Sci* 2007;256:3–9.
- 5 Habib G, Hoen B, Tornos P, *et al.* ESC Committee for Practice Guidelines. Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009): the Task Force on the Prevention, Diagnosis, and Treatment of Infective Endocarditis of the European Society of Cardiology (ESC). *Eur Heart J* 2009;19:2369–413.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow