



Acute Limb Ischemia Due to *Candida tropicalis* Mitral Valve Endocarditis

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Fungal endocarditis is a very rare entity and is associated with high morbidity and mortality rates. We report a 68-year-old man with fungal valvular endocarditis over the mitral valve with a large vegetation located over the anterior leaflet, presenting initially as acute limb ischemia of the left lower limb. Immediate embolectomy was performed for revascularization of the left lower limb. Pathologic section of the retrieved femoral embolectomy specimen revealed aggregated fungal spores and hyphae. Blood cultures were positive for *Candida tropicalis*. We should be alert to treat patients with acute arterial occlusion of the extremities and to investigate the underlying possible fatal etiology.

Key words: Fungal endocarditis, thrombus, acute limb ischemia

INTRODUCTION

Fungal endocarditis is a serious condition usually seen in immunologically suppressed and severely debilitated patients. It not only destroys valvular structures but also produces vegetations. It occurs rarely, accounting for only 2%–4% of all cases of endocarditis.¹ Arterial embolization is one of the major complications of fungal endocarditis and occurs most frequently in the lower limbs.² The diagnosis and treatment of fungal endocarditis and septic embolism are the challenges for the clinical physician. We report our experience of treating a patient in whom occlusion of the left femoral artery developed secondary to endocarditis caused by *Candida tropicalis*.

CASE REPORT

The patient was a 68-year-old Taiwanese man who presented at our hospital with a 3-day history of progressive left leg numbness and weakness. On the day of admission, his left leg and foot became cold and cyanotic to the extent that he could not move it at all. His medical history included hypertension and Type 2 diabetes mellitus for 20 years. He had undergone hemodialysis three times per week for end-stage renal disease within the last 8 years. His temperature was 38.3°C, heart rate 112 beats/min, respiratory

rate 20 breaths/min, and blood pressure 135/80 mmHg. On physical examination, the left leg was cold compared with the right leg, and there was no pulse over the left popliteal and dorsalis pedis arteries. There was a grade III–IV holosystolic murmur over the apex on cardiac auscultation. Initial laboratory results showed severe leukocytosis, with a leukocyte count of 23,790 and hemoglobin level of 7.7 g/dL. Levels of both creatine phosphokinase (665 U/L) and D-dimer (3478 ng/mL) were elevated. Contrast-enhanced computed tomographic angiography (CTA) of the bilateral lower extremities showed a total occlusion of the distal segment of the left superficial femoral artery [Figure 1a].

The patient was taken to the operating room for emergency embolectomy through the left femoral artery. A fibrin thrombus with inflammatory debris, which was dark-brown in color and soft in consistency, was removed from the left femoral artery. Transthoracic echocardiography revealed severe mitral regurgitation and a large vegetation measuring approximately 2.8 cm × 2.3 cm located over the anterior leaflet of the mitral valve [Figure 1b]. Broad-spectrum antimicrobial treatment with cefepime and fluconazole was commenced. Blood cultures grew *C. tropicalis*. The histopathologic findings

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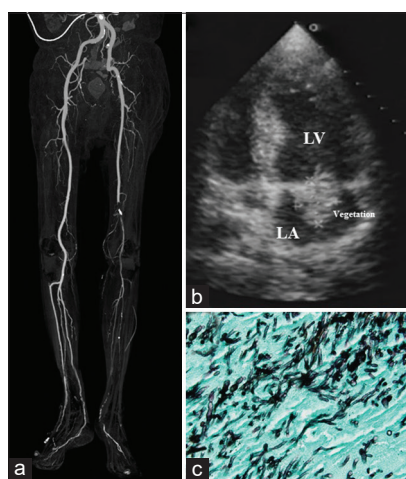


Figure 1: (a) Total occlusion of the distal segment of the left superficial femoral artery is demonstrated by contrast-enhanced computed tomographic angiography of the bilateral lower extremities. (b) Transthoracic echocardiography shows a large vegetation about 2.8 cm × 2.3 cm in size located over the anterior leaflet of the mitral valve. LV: Left ventricle; LA: Left atrium. (c) Grocott's methenamine silver stain (×400) identified aggregated fungal spores and septated hyphae from the thrombotic material extracted at embolectomy.

of the retrieved thrombus were consistent with a blood clot and foci of aggregated fungal yeasts and hyphae [Figure 1c]. *C. tropicalis* endocarditis of the mitral valve was diagnosed. Surgical intervention was advised, but the patient's family refused to consent to the operation and requested conservative medical treatment. Twelve days after admission, the patient had an acute change in the level of consciousness, with a Glasgow Coma Score of 3. Brain magnetic resonance imaging showed multiple acute lacunar infarctions involving the bilateral hemispheres and pons. These were consistent with embolic showering. His condition continued to deteriorate, and he died 33 days after admission.

DISCUSSION

Acute limb ischemia is defined as a sudden decrease in limb perfusion from either embolic or *in situ* thrombotic vascular occlusion that threatens the viability of the limb.³ Embolic arterial occlusion is the cause of acute ischemia in 15% of patients, and arterial thrombosis is the cause in 85% of patients, most of whom have atherosclerotic disease.⁴ Among patients with embolic occlusion, the emboli have a cardiac origin in over 90% of cases. Cardiac embolism is a particular concern in patients with atrial fibrillation, acute myocardial infarction, left ventricular dysfunction, or prosthetic heart valves, as well as in patients not receiving adequate anticoagulant therapy and having vegetations due to infective endocarditis.

Fungal endocarditis is a very rare entity and is associated with high morbidity and mortality. The most common anatomic

site of univalvular fungal vegetations in patients with fungal endocarditis is the aortic valve, and aortic valve vegetations may affect the aortic valve prosthesis, most commonly soon after valve surgery.^{5,6} Fungal endocarditis can have a wide range of complications, the most common being embolization, neurological deficits, and heart failure. Arterial embolization is a major complication of fungal endocarditis, occurring most frequently in the lower limbs although cases of embolization occurring in the brain or major visceral organs have also been reported.⁷⁻⁹

This complication is more frequent in patients with fungal disease than in those with bacterial disease as fungal valvular vegetations are more friable than bacterial vegetations.¹⁰ In high-risk patients with septic-type fever, acute ischemic limb, and heart murmur, we should always be alert to investigate the presence of vegetations from the heart valves.

Etiologically, *Candida albicans* is the most common pathogen in fungal endocarditis, followed by nonalbicans *Candida* spp., *Aspergillus* spp., and *Histoplasma capsulatum*, which usually produce large vegetations on heart valves and have a high propensity to embolize.⁵ The diagnosis is based on medical history, objective clinical findings, echocardiography, and conventional or CTA to determine the exact site of arterial obstruction. Definite diagnosis requires identification of the fungal emboli or isolation of fungus from blood or from the infected valve. Mortality from fungal endocarditis as high as 72% was found in an analysis of 270 cases over 30 years.⁵ Treatment guidelines for native valve *Candida* endocarditis strongly recommended surgical treatment within 1 week, combined with antifungal treatment consisting of liposomal amphotericin B or caspofungin for 6–8 weeks, with or without additional flucytosine, followed by fluconazole.¹¹ A significantly higher survival was observed in patients treated with combined surgery and antifungal agents compared with those treated with antifungals alone (55% vs. 36% at 1 year).⁵

CONCLUSION

We have described a case of *C. tropicalis* endocarditis of the mitral valve with an initial presentation of acute lower limb ischemia. Severely debilitated patients and high-risk patients, including intravenous drug abusers and HD patients, are vulnerable to a variety of opportunistic fungal infections, mostly by *Candida* spp. and *Aspergillus* spp. Although the prognosis of patients with fungal endocarditis has improved to 20%–45% over recent years, the outcome is extremely poor without surgical removal of the infected valve and adequate antifungal therapy.¹² We should be alert to treat patients with acute arterial occlusion of the extremities and to investigate the

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underlying cause of the embolism, including fungal vegetation from the involved heart valves as in the present case.

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Conflicts of interest

There are no conflicts of interest.

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