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Case Report

Fungal embolism of the infrarenal aorta – a life-threatening complication of endocarditis

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Abstract

Fungal embolism of the infrarenal aorta is a rare but critical complication of infective endocarditis, associated with significant morbidity and mortality. Outcomes depend heavily on timely detection and management. Here, we present an extremely rare case of acute aortic occlusion caused by *Candida albicans* originating from a valve other than the one that was replaced. This report emphasizes the importance of recognizing atypical manifestations of endocarditis in clinical practice and the need for early antifungal therapy in high-risk patients.

Keywords

aorta embolism, endocarditis, fungal, septic embolism

Introduction

Acute thromboembolic occlusion of the infrarenal aorta is a serious clinical condition. It occurs when a blood clot travels through the arterial system and becomes lodged in the aorta below the renal arteries. Common risk factors include cardiac conditions such as atrial fibrillation and valvular heart disease, as well as vascular conditions such as atherosclerosis and aneurysms. Key determinants of prognosis include early diagnosis and revascularization within six hours.[1] In cases where the condition is accompanied by an infectious pathogen, it is referred to as septic embolism, a condition that is associated with an increased risk of morbidity and mortality. In this study, we present a rare case of acute aortic occlusion caused by *Candida albicans*.

Informed consent has been obtained from the patient for the publication of this case report and its associated images.

Case report

An 80-year-old man was transferred from a secondary care hospital due to the sudden onset of acute lumbar pain and paraplegia, accompanied by cold and pale lower limbs. Upon examination, pulselessness of the extremities, hypoesthesia, and paraplegia were noted. A computerized tomography angiography (CTA) scan revealed occlusion of the distal abdominal aorta, the common iliac arteries, and the inferior mesenteric artery ***(Fig. 1)****. Additionally, renal infarction of the lower pole of the left kidney was revealed. The patient's med-*

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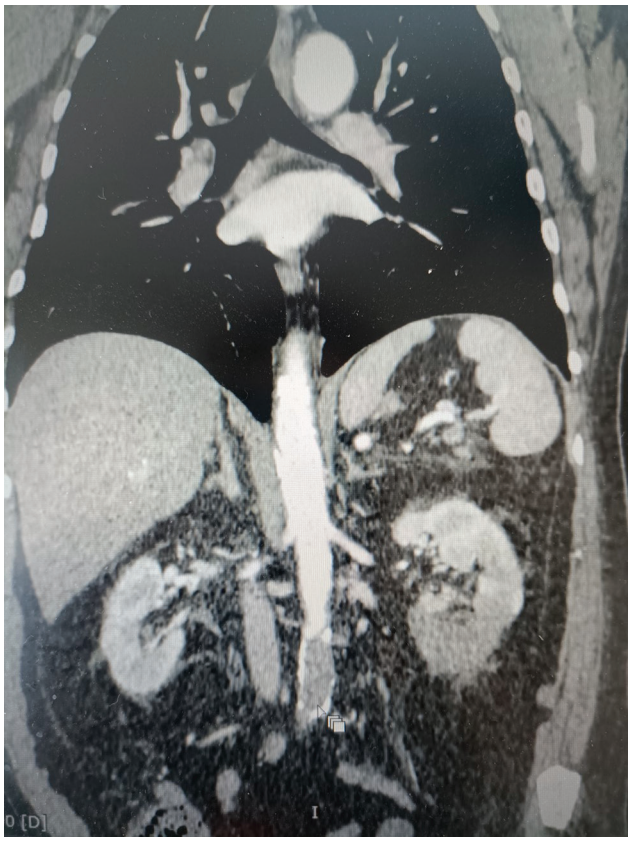

Figure 1. CT angiography revealing infrarenal occlusion of the aorta.

ical history included congestive heart failure, hyperuricemia, dyslipidemia, and arterial hypertension. The patient had undergone aortic valve replacement (bioprosthetic) six months ago. A month ago, the patient was admitted to a secondary care hospital due to pyrexia. During the fever investigation, an echocardiography exam was performed, which revealed the presence of a mobile echogenic mass in the posterior glottis of the mitral valve (1.32×0.7 cm, mildly irregular, with asynchronous motion with the wall) ***(Fig. 2)****, raising the suspicion of endocarditis. Blood cultures were negative at that time. We initiated intravenous administration of antibiotics (meropenem 2 g three times a day and vancomycin 1 g twice daily), which resulted in resolution of the fever and a gradual decline in inflammatory markers (white blood cell count of 9.68 K/μL, normal range 4–10 K/μL; procalcitonin level of 0.080 ng/mL, normal value <0.05; C-reactive protein level of 4.48 ng/mL, normal range 0.0–0.5 ng/mL). However, subsequent aortic embolism occurred and the patient was then transferred to our hospital. At the time of presentation to our hospital, the inflammatory markers were WBC 11.700 K/μL, procalcitonin 0.34 ng/mL, and CRP 6.4 ng/mL. The patient underwent emergent thromboembolectomy using Fogarty catheters. The embolic material was sent for histological and microbiological examination, both demonstrating presence of fungal infection. Also, blood cultures were positive at this time (Candida albicans). To the initial empirical prescription, anidulafungin was added based on the antibiogram. Regarding inflammatory markers, procalcitonin, and WBC fluctuated within a narrow range, whereas CRP showed greater variability. Postoperative course was protracted and complicated, ultimately leading to the patient's death two months after the operation.*

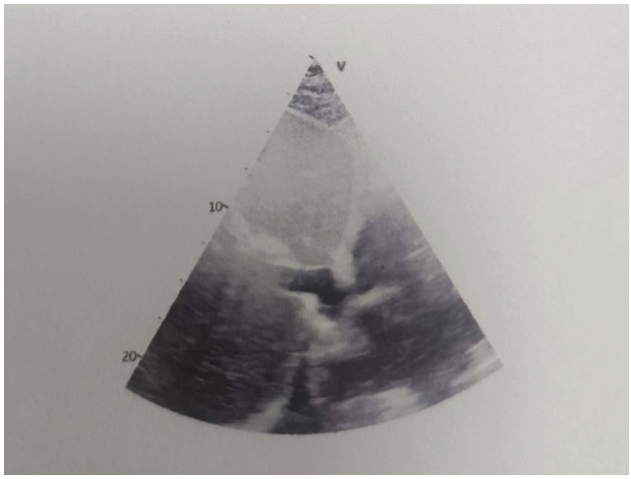

Figure 2. Echochardiography revealing a mobile echogenic mass in the posterior glottis of mitral valve.

Discussion

Acute aortic occlusion is an uncommon vascular emergency which carries a high degree of morbidity and mortality. It could be the result of acute embolism obstructing the aortic bifurcation or the thrombosis of an existing aortoiliac occlusive disease. Typical symptomatology includes sudden onset of back and lower limb pain, weakness/paralysis and ischemia of both lower extremities. Revascularization options are thromboembolectomy using Fogarty catheters, mechanical thrombectomy with or without stent placement, and axillary-bifemoral bypass.[1] Most significant complications include amputation, renal insufficiency and death. All of the aforementioned outcomes are affected by the level of the aortic occlusion and duration of ischemia.

Infective endocarditis (IE) is associated with high morbidity and mortality and clinical presentation is generally highly variable among patients. It may present with an acute, rapidly progressive infection with high fever 38°C, and combination of cardiac and systematic symptoms (dyspnea and chest pain).[2] However, fungal endocarditis, which represents approximately 1%–3% of all IE cases, has a more insidious clinical presentation with a low-grade or absence of fever, fatigue, and weight loss, which can mislead the initial assessment.[3,4] Risk factors for developing IE are both cardiac (e.g., valvular heart disease, prosthetic heart valve) and non-cardiac (e.g., immunosuppression, drug abusers). Modified Duke criteria guide physicians to diagnosis; nevertheless, a diagnosis of fungal IE requires a high degree of clinical suspicion. Embolization of vegetations of the valves usually results in widespread end-organ infarcts. Large enough septic emboli to acutely occlude the aorta

are, under any circumstances, rare. Blood culture-negative infective endocarditis (BCNIE) refers to IE in which no causative microorganism can be grown using the usual blood culture methods. Echocardiography is the first-line diagnostic imaging technique and positive blood cultures remain the cornerstone of IE diagnosis. Blood cultures identify the responsible microorganism and allows susceptibility testing to determine the definitive therapeutic approach. Blood culture-negative IE most commonly arises as a consequence of previous antibiotic administration, underlying the importance of performing blood cultures prior to antibiotic therapy, or due to non-bacterial causative microorganisms (fungi) or fastidious bacteria.[3] In this case, the initial diagnosis was considered to be BCNIE, and the patient was administered antibiotics empirically. However, one month later and whilst the patient seemed to recover, the aortic embolization occurred. At the time of presentation, blood cultures and samples from clot removal unfolded the presence of fungi. It is also noteworthy that the postoperative trans-esophageal echocardiography did not reveal the presence of vegetation which was initially seen on mitral valve. This led us to the conclusion that the entire vegetation dislodged and resulted in aorta embolization.

In an interesting systematic review by Slouha et al., the differences among different types of aortic valve replacements were evaluated.[5] Comparing surgical aortic valve replacement and transcatheter aortic valve replacement, both occurred at an average of 2%. However, there is a difference in the time a patient acquires IE after valve replacement. So, in the case of surgical replacement, the average time is 1540 days, whereas after transcatheter replacement, the average time is 89 days.

Fungal endocarditis is less common than bacterial endocarditis, but its incidence is increasing, especially after COVID-19 infection. Yassin et al. reported a case with fungal endocarditis 9 months following COVID-19 infection.[6] Its clinical presentation is more insidious; thus, physicians might consider empiric antifungal treatment in certain high-risk situations such as AIDS, cancer, organ transplant patients on immunosuppressive therapy, prosthetic valve endocarditis, intravenous drug users, recurrent endocarditis or prolonged infection, or hospital-acquired endocarditis.

Conclusion

An early diagnosis of infective endocarditis and prolapse of thromboembolic disease may lead to a lower incidence of acute ischemia. In clinical situations where risk factors suggest fungal involvement, physicians should maintain high suspicion for fungal endocarditis in order to initiate early antifungal therapy.

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Competing interests

The authors have declared that no competing interests exist.

Authors contribution

Concept and design: C.A. and A.P.; analysis and interpretation: C.A., C.G., and A.M.; data collection: A.P., C.G., and K.S.; writing the article: C.A. and A.P.; critical revision of the article: S.A. Final approval of the article: all authors. Overall responsibility: A.M.

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