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IMAGE

Non-Valvular Cardiac Aspergilloma: A Rare Presentation of a Rare Condition

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A 50-year old lady presented to hospital with blurred vision and pyrexia. She had previously undergone a renal transplant and was on standard immunosuppression therapy. In addition, she had recently been treated for invasive pulmonary aspergillosis. On this admission, she was diagnosed with endophthalmitis and a right ankle abscess. She was started on broad spectrum antimicrobials and the ankle collection was drained. She continued to have febrile episodes and a transthoracic echocardiogram revealed an echogenic mass in the left ventricle (Figure 1A). A transoesophageal echocardiogram further delineated the lesion as a 2.2 cm x 1.4 cm mass attached to the basal septum (Figure 1B-C). There were no vegetations on the cardiac valves. Surgical excision was indicated and histological examination revealed an aspergilloma (Figure 1D-F). Histology of the ankle fluid also demonstrated *Aspergillus* (Figure 1).

Fungal endocarditis is a rare and potentially fatal condition. It is confirmed in less than 10% of patients diagnosed with endocarditis [1] and *Aspergillus* is the causative microbe in 24% of these cases [1]. *Aspergillus* endocarditis is usually associated with the cardiac valves with minimal reports highlighting solitary aspergillomas. In these cases, invasion of the microbe likely results from haematogenous spread of the fungus leading to subendocardial hyphae infiltration and subsequent growth into the ventricular cavity [2,3]. The resulting lesions can be large and pedunculated and have a tendency to embolise, particularly to the central nervous system. Patients are usually immunocompromised (e.g. receiving corticosteroids) and the literature describes concomitant malignancy and prolonged antibiotic courses as further predisposing factors [4–6].

The clinical presentation of *Aspergillus* endocarditis can be nonspecific and the diagnosis is often delayed or unfortunately made at post-mortem. Unlike non-fungal endocarditis, patients are commonly apyrexial [7] and furthermore, blood cultures are invariably negative. In cases of mural endocarditis, a new murmur may be absent due to the lack of valvular involvement. As such, clinical suspicion needs to be high and the working diagnosis is typically derived via cardiac imaging (e.g. transoesophageal echocardiography). Galactomannan antigen testing can be performed however these assays have a lower sensitivity for *Aspergillus fumigatus* and may be falsely positive in patients taking antibiotics [8]. Therefore, in order to confirm the diagnosis, histology or tissue culture is commonly needed. Operative pathology reveals *Aspergillus hyphae* with frequent septations and acute angle branching (as demonstrated in Figure 1E) [8]. Long-term antifungal therapy (e.g. intravenous voriconazole) is mandated and excision of the cardiac lesion is generally required for complete resolution. Despite this, the outcomes in *Aspergillus* endocarditis are poor with a recent cohort study of 31 cases demonstrating 42% mortality [7].

In conclusion, a high index of suspicion for cardiac involvement is needed in patients with suspected disseminated aspergillosis. Prompt cardiac imaging to rule out both valvular, and nonvalvular, lesions is essential and upon diagnosis of endocarditis, early liaison with our microbiology and cardiothoracic colleagues is mandated.

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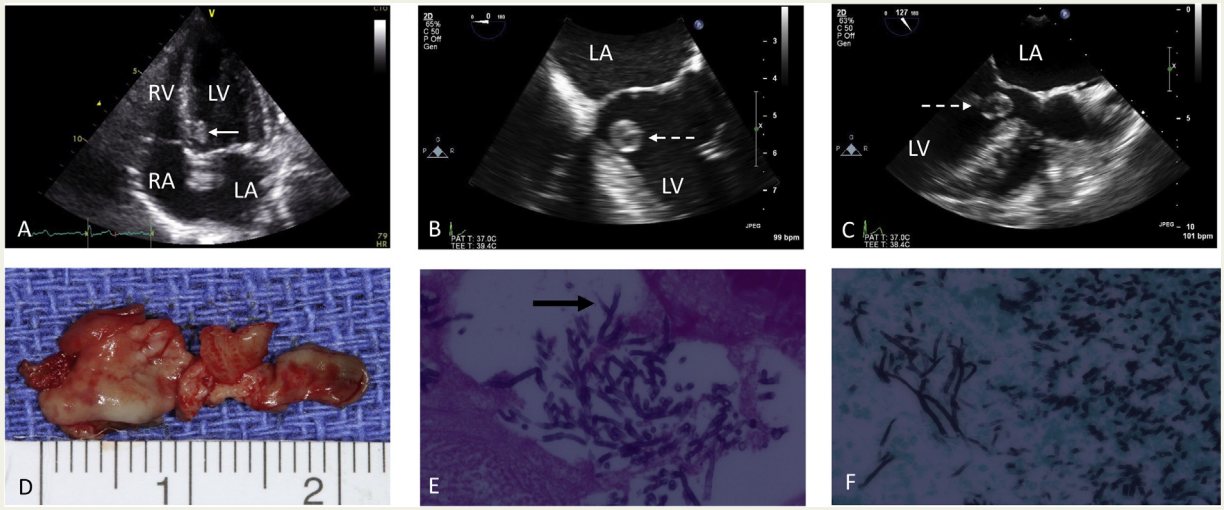

Figure 1 A: TTE apical 4-chamber view revealing a cardiac mass in the left ventricle (white arrow). B-C: Zoomed TOE 2D midoesophageal 4-chamber view and TOE 2D midoesophageal long axis view revealing mass attached to the basal interventricular septum (dashed arrows). D: Surgical photograph demonstrating excised cardiac mass (scale in centimetres). E: Haematoxylin and eosin stain x 400 magnification of cardiac mass. Black arrow demonstrates typical branching seen in *Aspergillus*. F: Grocott's methenamine silver stain x 400 magnification of cardiac mass.
Abbreviations: TTE, transthoracic echocardiogram; TOE, transoesophageal echocardiogram; 2D, two dimensional; RV, right ventricle; LV, left ventricle; RA, right atrium; LA, left atrium.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.hlc.2019.02.002.

References

[1] Ellis ME, Al-Abdely H, Sandridge A, Greer W, Ventura W. Fungal endocarditis: evidence in the world literature, 1965-1995. Clin Infect Dis 2001;32(1):50–62.
[2] Walsh TJ, Hutchins GM. Aspergillus mural endocarditis. Am J Clin Pathol 1979;71(6):640–4.
[3] Mullen P, Jude C, Borkon M, Porterfield J, Walsh TJ. Aspergillus mural endocarditis. Clinical and echocardiographic diagnosis. Chest 1986;90(3):451–2.
[4] Kearney RA, Eisen HJ, Wolf JE. Nonvalvular infections of the cardiovascular system. Ann Intern Med 1994;121(3):219–30.
[5] Pavlina AA, Peacock JW, Ranginwala SA, Pavlina PM, Ahier J, Hanak CR. Aspergillus mural endocarditis presenting with multiple cerebral abscesses. J Cardiothorac Surg 2018;13(1):107.
[6] Lim ML, Oliver DH, Barasch E. Aspergillus Mural Vegetation Identified by Transesophageal Echocardiography. Echocardiography 1997;14(3):283–6.
[7] Meshaal MS, Labib D, Said K, Hosny M, Hassan M, Abd Al Aziz S, et al. Aspergillus endocarditis: Diagnostic criteria and predictors of outcome, a retrospective cohort study. PLoS One 2018;13(8):e0201459.
[8] Kalokhe AS, Rouphael N, El Chami MF, Workowski KA, Ganesh G, et al. Aspergillus endocarditis: a review of the literature. Int J Infect Dis 2010;14(12):e1040–1047.