Noninvasive Detection of Fungal Endocarditis

Fungi rank rather low among microbial agents causing endocarditis. Nonetheless, the occurrence of fungal endocarditis with the development of large mycotic vegetations attached to the aortic or mitral leaflets is increasing in frequency. Three distinct predisposing conditions include (1) disseminated mycotic infection, (2) intravenous narcotic abuse, and (3) impaired host defenses.

Changes in the epidemiology of infective endocarditis have been attributed in part to medical progress. Examples of “advances” in medical technology that predispose to infection by impairing or bypassing host defenses include prolonged therapy with antibiotic drugs, intravascular portals of entry (eg, indwelling plastic catheters), cardiac prosthetic valves, and sophisticated cardiovascular surgery. It is ironic that therapy for bacterial endocarditis using high-dose therapy with antibiotics administered via long-term indwelling catheters should predispose to fungal endocarditis.

The most common fungi to cause endocarditis are Candida species, although aspergilli are an increasing cause of infection following cardiac surgery. The clinical features of fungal endocarditis generally resemble those of bacterial endocarditis; however, embolization to a major artery is particularly suggestive of a fungal etiology. Mycotic vegetations on cardiac valves tend to be large, friable, and easily detached. Histologic examination and culture of the surgically removed embolic material aid greatly in establishing a fungal etiology. Also, the sheer bulk of fungal vegetations often results in changing cardiac murmurs, an otherwise overstated criterion for infective endocarditis. With the possible exception of cryptococcal infection, no reliable serologic tests are yet available to diagnose mycotic endocarditis. Finally, although cultures of blood are often positive when Candida species are causative, other fungi are rarely isolated from the blood, despite specific attention to culturing these agents.

M-mode echocardiography appears to be a promising aid for the detection of valvular vegetations, which in the appropriate clinical setting may direct the physician to a diagnosis of mycotic valvulitis. Candida vegetations have been visualized on aortic, mitral, and prosthetic valves and have been seen to mimic a left atrial myxoma.

Because vegetations must reach a certain size (2 mm or more) to be visualized by this method, echocardiography is an insensitive tool for screening for endocarditis; however, the usual large size of fungal vegetations should permit a greater yield in this form of endocarditis. In addition, the mere detection of vegetations may be helpful prognostically; such patients frequently do not survive with medical therapy alone. It should be appreciated that echocardiography cannot distinguish infectious from noninfectious vegetations or from myxomatous degeneration. No studies of echocardiography are yet available to indicate its true efficacy as a diagnostic tool.

Although the use of the cross-sectional (real-time, two dimensional) echocardiogram in the detection of vegetations appears promising, its contribution over and above the standard M-mode echocardiogram requires further evaluation. In the presence of the often repeated clinical setting of fever, anemia, cardiac murmurs, and “negative” blood cultures, particularly when the patient already has other serious illnesses, echocardiography may be the only noninvasive tool that will keep the clinician on a course to the correct diagnosis.

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