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# Infective endocarditis and perivalvular abscess: a dangerous duo

Stephen D. Shafran

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**I**nfective endocarditis involving the left side of the heart remains a serious medical problem, with substantial morbidity and mortality. Its incidence has been reported to range from 1.7 cases<sup>1</sup> to 6.2 cases<sup>2</sup> per 100 000 person-years, the risk increasing significantly with advancing age. In most series, more men than women are affected, but not all studies have shown a male preponderance. The risk of infective endocarditis among injection drug users is considerably higher, but most cases are confined to the tricuspid valve and are associated with a very low death rate. With the declining incidence of rheumatic heart disease in most developed countries, an increasing proportion of cases of infective endocarditis occur in people with no known underlying heart disease, those with bicuspid aortic valves and those with mitral valve prolapse.

Serious complications and deaths related to left-sided infective endocarditis are due to either cerebral emboli causing severe neurologic deficits or to intracardiac suppurative complications, which can cause severe valvular regurgitation, rupture of the ventricular septum, rupture of the ventricular free wall and disruption of the conducting system, with attendant heart block.

The clinical diagnosis of infective endocarditis has been greatly improved by the advent and subsequent improve-

ments in echocardiography. In recognition of this, revised criteria for the clinical diagnosis were introduced in 1994 by the Duke Endocarditis Service,<sup>3</sup> now widely known as the "Duke criteria." Many investigators have shown that these criteria are superior to previously used clinical criteria. Nevertheless, a few deficiencies in the Duke criteria have been identified, leading to recent modifications.<sup>4</sup>

Perivalvular abscess is a known and feared complication of left-sided endocarditis because it is associated with increased mortality. It appears to occur more often with prosthetic valve endocarditis than with native valve endocarditis, and it appears to be more common when the pathogen is *Staphylococcus aureus* than when viridans group streptococci are the infecting organisms. The first use of echocardiography to detect a perivalvular abscess before surgery was reported as long ago as 1978.<sup>5</sup> However, the advent of transesophageal echocardiography has markedly improved the diagnostic sensitivity of echocardiography for infective endocarditis in general and perivalvular abscess in particular.<sup>6</sup> In the largest series of perivalvular abscesses reported, the sensitivity of transesophageal echocardiography for detecting perivalvular abscess was 80%, as compared with only 36% for transthoracic echocardiography.<sup>7</sup>

In this issue (see page19) Kwan-Leung Chan reports on

43 consecutive patients with perivalvular abscess treated at the University of Ottawa Heart Institute.<sup>8</sup> There was a male preponderance, and 60% of the patients had prosthetic valve endocarditis. All cases involved the left side of the heart, with the aortic valve being involved in 36 cases, the mitral valve in only 3 cases and both valves in 4 cases. Consistent with previous reports, *S. aureus* was the most common pathogen.

Chan does not indicate the total number of cases of endocarditis assessed by the University of Ottawa Heart Institute during the study period, what proportion involved native valves versus prosthetic valves, what proportions were due to which pathogens and, perhaps most important, what proportion was referred to this regional referral centre specifically for consideration of cardiac surgery, which is not available elsewhere in the Ottawa region. These factors may have significantly affected the data, as referral bias is well known to influence the clinical features of cases of infective endocarditis.<sup>9</sup> The incidence of perivalvular abscess has varied substantially in the literature, from 13% of cases in one clinical series<sup>10</sup> to 30% in an autopsy study,<sup>11</sup> which will obviously overestimate the incidence of this serious complication.

Nevertheless, Chan importantly points out the serious morbidity and mortality associated with the complication of perivalvular abscess. Cardiac surgery was performed in nearly all subjects, except those who had contraindications or who were considered to be at exceedingly high surgical risk. Slightly over half of the patients had died after a mean of 4.5 years of follow-up, mostly of cardiac causes. Echocardiography performed in 24 patients following cardiac surgery showed that a substantial minority had significant paraprosthetic regurgitation and pseudoaneurysms despite surgery. The functional status of these survivors was not described.

Left-sided infective endocarditis continues to be a serious disease, particularly when *S. aureus* is the pathogen or a prosthetic valve is involved. It carries substantial morbidity and mortality despite modern medical and surgical management. Although case series continue to suggest that the outcome is likely improved with surgery,<sup>10,12-15</sup> these studies are not randomized and are consistently biased against medical therapy alone by excluding from the surgical group patients judged to be at very high surgical risk. Randomized trials of medical versus surgical therapy have never been conducted and are probably impossible to carry out.

In recognition of the limitations of the data, the current consensus is that intracardiac abscesses should be treated surgically as well as with bactericidal antibiotic therapy. Patients with infective endocarditis need to be monitored vigilantly for complications, and these should be treated as

quickly as possible. Transesophageal echocardiography is a significant advance that makes the diagnosis of infective endocarditis easier and identifies intracardiac abscesses earlier, when intervention may prove more fruitful. Consequently, it is the preferred mode of echocardiography when infective endocarditis is suspected.

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