

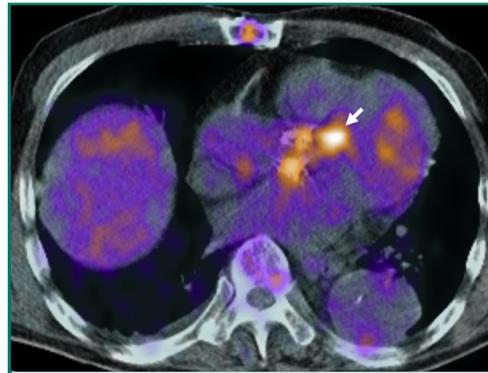
# Prosthetic Valve Endocarditis Diagnosed by $^{18}\text{F}$ -Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography



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A 74-year-old man with a history of prosthetic aortic valve replacement 4 years before presentation was evaluated for a fever since the previous day. Although multiple blood cultures were positive for penicillin-susceptible *Streptococcus gordonii*, an oral viridans streptococcus vegetation was not detected by echocardiography, and the modified Duke criteria for infective endocarditis were not met. Despite treatment with penicillin G (18 million units daily) for 2 weeks after negative blood cultures, 4 days after the last dose blood cultures turned positive for the identical organism. Results of repeated echocardiography and physical examinations were unremarkable. Laboratory results showed a mild increase in erythrocyte sedimentation rate and a positive rheumatoid factor, which were suggestive of, but still inconclusive for, the diagnosis of infective endocarditis.  $^{18}\text{F}$ -fluorodeoxyglucose positron emission tomography/computed tomography demonstrated a focal hot spot of fluorodeoxyglucose uptake around the prosthetic valve (Figure), a new major criterion for the diagnosis of prosthetic valve endocarditis in the latest guidelines.<sup>1</sup> We diagnosed prosthetic valve endocarditis, which was cured using a higher dose of penicillin G (24 million units daily) for 6 weeks following negative blood cultures without any complications.

Although echocardiography and blood cultures are central to the diagnosis and management of patients with infective endocarditis,<sup>2</sup> the modified Duke criteria are inconclusive in more than 20% of patients with suspected prosthetic valve endocarditis.<sup>3</sup>  $^{18}\text{F}$ -fluorodeoxyglucose positron emission



**FIGURE.** Abnormal fluorodeoxyglucose uptake around the site of aortic prosthetic valve (arrow).

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tomography/computed tomography is useful for the diagnosis of infective endocarditis in patients with prosthetic valves, especially when the conventional modified Duke criteria are not met despite a high clinical suspicion of the disease.<sup>4</sup>

**Potential Competing Interests:** Dr Kushimoto is a board member for CSL Behring; is a consultant to Alexion; receives departmental grants from Pfizer, Asahikasei, Teijin, Nihon Pharmaceutical, Shionogi Pharmaceutical, and Dainihonsumitomo Pharmaceutical; and serves on the speakers bureaus for Pfizer, Asahikasei, Teijin, Nihon Pharmaceutical, Shionogi Pharmaceutical, Ono Pharmaceutical, and CSL Behring. The other author reports no competing interests.

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1. Habib G, Lancellotti P, Antunes MJ, et al. 2015 ESC guidelines for the management of infective endocarditis: the Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC) Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European

- Association of Nuclear Medicine (EANM). *Eur Heart J*. 2015; 36(44):3075-3128.
2. Barton TL, Mottram PM, Stuart RL, Cameron JD, Moir S. Transthoracic echocardiography is still useful in the initial evaluation of patients with suspected infective endocarditis: evaluation of a large cohort at a tertiary referral center. *Mayo Clin Proc*. 2014;89(6):799-805.
  3. Gomes A, Glaudemans A, Touw DJ, et al. Diagnostic value of imaging in infective endocarditis: a systematic review. *Lancet Infect Dis*. 2017;17(1):e1-e14.
  4. Swart LE, Gomes A, Scholtens AM, et al. Improving the diagnostic performance of <sup>18</sup>F-FDG PET/CT in prosthetic heart valve endocarditis. *Circulation*. 2018;138(14):1412-1427.