

Repeat Transoesophageal Echocardiogram is Recommended in Endocarditis Patients with Paravalvular Oedema Despite Sensitivity to Antibiotics and Improving Parameters

Dear Editor,

A 39-year-old man with stable aortic regurgitation secondary to congenital bicuspid aortic valve was diagnosed with *Streptococcus mitis* infective endocarditis with low minimum inhibitory concentration to penicillin. Initial transoesophageal echocardiography demonstrated aortic root oedema with vegetations seen on the aortic valve. Despite improving clinical parameters on intravenous penicillin and gentamycin, a repeat transoesophageal echocardiogram 1 week later showed para-aortic valvular abscess, a fistula extending from the aortic root to the right atrium, and a vegetation on the tricuspid valve. This patient underwent urgent surgical repair of aortic valve.

Case Report

A 39-year-old man with stable aortic regurgitation secondary to congenital bicuspid aortic valve presented to hospital with a 3-week history of lethargy, rigors and fever. The first set of blood culture showed alpha-haemolytic streptococcus, later confirmed as *Streptococcus mitis* with low minimum inhibitory concentration (MIC = 0.032 ug/mL), and intravenous (IV) penicillin 18 megaunits daily was prescribed in divided doses.

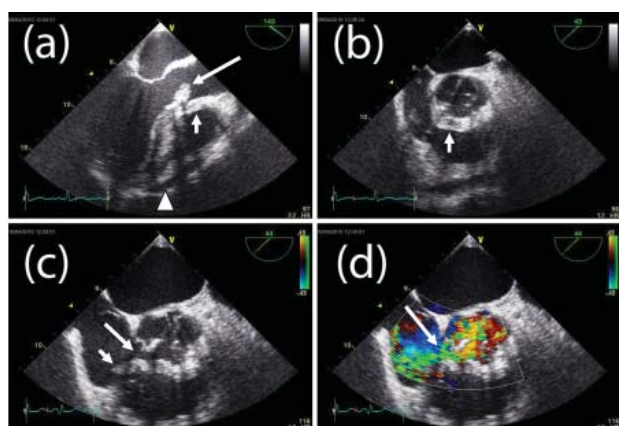


Fig. 1. (a). Initial transoesophageal echocardiography demonstrated a 1.3 x 1.0 cm vegetation (long arrow) at the aortic valve as well as aortic root thickening suggesting oedema or possible abscess formation (short arrow). Pericardial effusion (arrow head) was also observed. (b). Repeated transoesophageal echocardiography 1 week later showed the bicuspid aortic valve with an abscess (short arrow) in the short axis aortic valve view. (c). The same TOE performed 1 week later showing the fistula (long arrow) connecting aortic root to right atrium. A vegetation was also observed at the septal leaflet of the tricuspid valve (short arrow). (d). Colour doppler applied to the same image as (c) confirmed the flow through the aorto-atrial fistula (short arrow).

Transthoracic echocardiography showed possible aortic valve vegetation, confirmed by the transoesophageal echocardiography (TOE). This showed a 1.3 x 1.0 cm vegetation on the right coronary cusp of the bicuspid aortic valve and aortic root oedema, possibly suggesting early abscess formation (Fig. 1a). Daily IV gentamycin (3 mg/kg) was added to the treatment regime. Despite improving inflammatory and clinical markers, a repeat TOE performed one week later revealed a para-aortic valvular abscess, a fistula extending from the aortic root to right atrium, and a vegetation on the tricuspid valve (Figs. 1b, c, d). The patient underwent aortic valve replacement surgery with correction of the fistula. Recovery was complicated by complete atrioventricular block which required permanent pacemaker implantation.

Discussion

Bicuspid aortic valve is present in 0.8% to 2% of the general population,^{1,2} and is associated with a higher incidence of developing aortic stenosis and regurgitation. The most recent 2007 American Heart Association guidelines³ on prevention of infective endocarditis do not recommend antibiotic prophylaxis prior to dental procedure in the presence of a congenital bicuspid aortic valve. The annual incidence of infective endocarditis is approximately 0.16% per year in unoperated children and adolescents with bicuspid aortic valves.⁴ The risk of complications associated with endocarditis increases with age and may result in life-threatening severe aortic regurgitation and embolic events when the aortic valve is involved. Cardiothoracic surgery for urgent aortic valve is indicated for uncontrolled infections and paravalvular extensions which occur in 10% to 15% of native valve infective endocarditis.

Streptococcus mitis is an oral commensal bacteria from the alpha-haemolytic viridans group. Most strains of viridan streptococcus group are susceptible to penicillin; MIC <0.1 ug/mL. The recommended antibiotic regime in penicillin-susceptible infective endocarditis includes intravenous penicillin, ceftriaxone or vancomycin for 4 weeks or penicillin/gentamicin combination for 2 weeks.⁵ Our patient had a low MIC, suggesting adequate sensitivity to intravenous penicillin/gentamicin therapy.

In the case described above, rupture of the abscess with fistula to the right atrium resulted in development of a new vegetation on the tricuspid valve. This occurred despite

aggressive antibiotic therapy for 10 days. At that time, fever had settled from 38°C on admission, but low grade spiking temperature up to 37.5°C had been noted, suggesting the development of a possible abscess. C-reactive protein had also improved from 200 mg/L on admission to 110 mg/L at the time of the second TOE.

This case therefore highlights the importance of vigilance in cases involving the paravalvular aortic region with repeat TOEs despite clinical evidence of improving infection, even in cases where the bacteria is highly sensitive to antibiotics. In summary, our case demonstrates a case of failed medical therapy in penicillin-sensitive *Streptococcus mitis* infective endocarditis despite a low MIC, and highlights the benefit of a follow-up TOE.

REFERENCES

1. Roberts WC. The congenitally bicuspid aortic valve. A study of 85 autopsy cases. *Am J Cardiol* 1970;26:72-83.
2. Nistri S, Basso C, Marzari C, Mormino P, Thiene G. Frequency of bicuspid aortic valve in young male conscripts by echocardiogram. *Am J Cardiol* 2005;96:718-21.
3. Wilson W, Taubert KA, Gewitz M, Lockhart PB, Baddour LM, Levison M, et al. Prevention of infective endocarditis: guidelines from the American Heart Association: a guideline from the American Heart Association Rheumatic Fever, Endocarditis, and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *Circulation* 2007;116:1736-54.
4. Gersony WM, Hayes CJ, Driscoll DJ, Keane JF, Kidd L, O'Fallon WM, et al. Bacterial endocarditis in patients with aortic stenosis, pulmonary stenosis, or ventricular septal defect. *Circulation* 1993;87:1121-6.
5. Kasper DL, Braunswld E, Fauci AS, Hauser SL, Longo DL, Jameson JL, et al, editors. *Harrison's Principles of Internal Medicine*. 16th ed. New York: McGraw-Hill, 2005.

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