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Giant a waves

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DESCRIPTION

A 24-year-old man with a bioprosthetic tricuspid valve related to a history of infective endocarditis secondary to intravenous drug use was admitted to the hospital with fever and dyspnoea over the course of 2–3 weeks in the context of recidivism. On examination, the temperature was 38.0°C and the respiratory rate 24 breaths per minute. Qualitative analysis of the jugular venous waveform revealed the usual components, including two peaks, the a and v waves, and two troughs, the x and y descents. However, the first peak was more pronounced than usual, an abnormality known as a giant a wave. These waves coincided with a late diastolic murmur heard over the left lower sternal border that augmented with inspiration (see [video 1](#)). Blood cultures grew methicillin-sensitive *Staphylococcus aureus*. Transthoracic echocardiography demonstrated a large vegetation on the bioprosthetic tricuspid valve with an associated mean transtricuspid valve gradient of 17 mm Hg, consistent with severe tricuspid stenosis. The a wave

is a normal feature of the jugular venous waveform and results from atrial contraction during late diastole. When there is resistance to atrial emptying, such as in tricuspid stenosis, atrial contraction causes increased back pressure in the venous fluid column, which manifests as a giant a wave in the jugular vein. This patient was treated with intravenous antibiotics but blood cultures remained positive and clinical deterioration ensued. Valve replacement was not offered because of unfavourable psychosocial factors and he was discharged home with hospice support.

Learning points

- ▶ Qualitative assessment of the jugular venous waveform can reveal abnormalities such as cardiac dysrhythmia, structural heart disease (including valvulopathy) and pericardial disease. Giant a waves can be associated with tricuspid stenosis or right ventricular hypertrophy.
- ▶ Medical management with antibiotics is the cornerstone of treatment of tricuspid endocarditis, with an inhospital mortality of less than 5%.¹ Surgical intervention should be considered when medical therapy fails, or when certain complications develop, such as paravalvular abscess, persistent right heart failure, severe valvular regurgitation, dehiscence of a prosthetic valve or fistula formation.
- ▶ Tricuspid stenosis most commonly occurs in patients with rheumatic heart disease, but it can develop in the setting of endocarditis when vegetations are large and obstructive.² In addition to the giant a wave, other signs of tricuspid stenosis include a low-medium pitched diastolic murmur that augments with inspiration (Carvallo's sign) and an enlarged liver with a firm edge that is pulsatile in presystole. The latter is best appreciated with one hand on the liver edge and one on the precordium.³

Contributors AMM captured the audio of the heart sounds and video of the jugular venous waveform. TEB created the synchronised video. TEB and AMM were involved in writing the manuscript.

Competing interests None declared.

Patient consent Obtained.

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Video 1 A digital stethoscope recording of the heart murmur (audio) synchronised with visual demonstration of the giant a waves (video). Note that the murmur and giant a waves are coincident because both events are related to contraction of the right atrium. Also note that the murmur increases in intensity with inspiration (indicated by chest rise), a finding known as Carvallo's sign.



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REFERENCES

- 1 Yong MS, Coffey S, Prendergast BD, *et al*. Surgical management of tricuspid valve endocarditis in the current era: a review. *Int J Cardiol* 2016;202:44–8.
- 2 Waller BF, Howard J, Fess S. Pathology of tricuspid valve Stenosis and pure tricuspid regurgitation--part I. *Clin Cardiol* 1995;18:97–102.
- 3 Shah PM, Raney AA, disease Tvalve*Curr Probl Cardiol* 2008;33:47–84.

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