

IMAGES AND VIDEOS

A striking image of spontaneous echo contrast in severe mitral stenosis in a patient with good international normalised ratio (INR) control

Daniel A Jeffery MBBCh, Guy Lloyd MD FRCP and Arjun K Ghosh PhD MRCP

Barts Heart Centre, London, UK

Correspondence
should be addressed
to D A Jeffery
Email
daniel.jeffery@bartshealth.nhs.uk

Summary

A 38-year-old male was referred to our valve clinic for assessment. The patient had been diagnosed with untreated rheumatic mitral stenosis (MS) in 2009. The patient was diagnosed with atrial fibrillation in 2016 (on warfarin with good international normalised ratio (INR) control). Transthoracic echocardiography demonstrated severe MS (11 mmHg mean gradient across valve, 0.9 cm² valve area by planimetry), no mitral regurgitation, moderate left ventricular systolic dysfunction, volume and pressure loaded impaired right ventricle, moderate tricuspid regurgitation and severe pulmonary hypertension (estimated right ventricular systolic pressure was 76–81 mmHg with a tricuspid regurgitation maximum velocity of 4.12 m/s). A large amount of spontaneous echo contrast (SEC) was noted in the severely dilated left atrium and a transoesophageal echocardiogram (TOE) was requested for further assessment of the MS (Fig. 1, Videos 1, 2 and 3). The patient was symptomatic with shortness of breath and reduced exercise tolerance consistent with NYHA class III–IV.

The extent of SEC (representing slow flowing blood) in a patient with an acceptable INR of 2.5 is striking. The AHA guidelines (1) and ESC guidelines (2) suggest managing rheumatic MS based on stenosis severity, symptoms and the presence of left atrial clot. In this case, following multidisciplinary team (MDT) discussion, it was felt that the patient was too high risk for balloon valvuloplasty. The case was also discussed with the heart transplant service who felt that the patient was not a candidate for heart transplantation due to pulmonary hypertension. A consensus decision was then made to offer the patient a high-risk mitral valve replacement surgery with mechanical circulatory support if required. A 33 mm Sorin mechanical mitral valve was thereafter implanted in an uncomplicated operation.

The patient has been reviewed subsequently in clinic and has had a dramatic improvement in symptoms. Repeat echocardiography demonstrated a well-functioning valve and resolution of SEC. The learning point in this case is that having a therapeutic INR does not necessarily stop significant SEC from being observed on echocardiography, especially if there are important contributory factors, which in this case was severe MS. It is to be remembered that SEC is a marker of stasis and has been shown to occur due to (platelet-independent) RBC aggregation in sluggish, low-shear stress flow conditions (3).

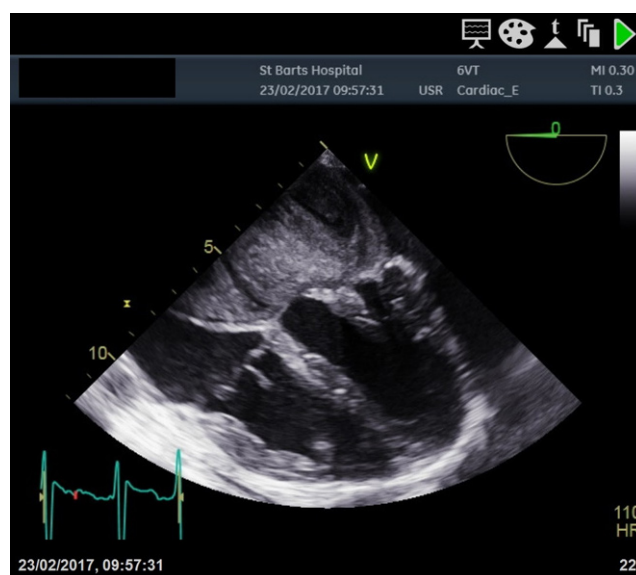


Figure 1

Transoesophageal echocardiogram still image. Mid-oesophageal view at 0° showing spontaneous echo contrast filling a dilated left atrium with bulging of the interatrial septum to the right. Thickened mitral valve leaflets are also seen.

Video 1

2D video at 0° demonstrating spontaneous echo contrast and stenotic mitral valve. View Video 1 at <http://movie-usa.glencoesoftware.com/video/10.1530/ERP-17-0029/video-1>.

Video 2

Multiview reconstruction from base of left ventricle through to apex demonstrating spontaneous echo contrast, stenotic mitral valve and moderate left ventricular systolic dysfunction. View Video 2 at <http://movie-usa.glencoesoftware.com/video/10.1530/ERP-17-0029/video-2>.

Video 3

3D reconstruction of mitral valve demonstrating spontaneous echo contrast. View Video 3 at <http://movie-usa.glencoesoftware.com/video/10.1530/ERP-17-0029/video-3>.

Declaration of interest

The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of this article.

Funding

This work did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Patient consent

Written consent was obtained from the patient.

Author contribution statement

D J prepared the manuscript; G L performed TOE and obtained images; A G edited the manuscript.

References

- 1 Nishimura RA, Otto CM, Bonow RO, Carabello BA, Erwin JP, Guyton RA, O’Gara PT, Ruiz CE, Skubas NJ, Sorajja P, *et al.* 2014 2014 AHA/ACC guideline for the management of patients with valvular heart disease. *Journal of the American College of Cardiology* **63** 57–185. (doi:10.1016/j.jacc.2014.02.536)
- 2 Vahanian A, Alfieri O, Andreotti F, Antunes MJ, Barón-Esquivias G, Baumgartner H, Borger MA, Carrel TP, De Bonis M, Evangelista A, *et al.* 2012 Guidelines on the management of valvular heart disease (version 2012). *European Heart Journal* **33** 2451–2496. (doi:10.1093/eurheartj/ehs109)
- 3 Rastegar R, Harnick DJ, Weidemann P, Fuster V, Collier B, Badimon JJ, Chesebro J & Goldman ME 2003 Spontaneous echo contrast videodensity is flow-related and is dependent on the relative concentrations of fibrinogen and red blood cells. *Journal of the American College of Cardiology* **41** 603–610. (doi:10.1016/S0735-1097(02)02898-X)

Received in final form 26 July 2017

Accepted 27 July 2017

Accepted Preprint published online 27 July 2017