Obstructive mechanical valve thrombosis: utility of 3D trans-oesophageal echocardiography

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A 73-year-old man presented to a tertiary Cardiothoracic Hospital with NYHA Class III dyspnoea and orthopnoea on the background history of bileaflet mechanical mitral valve replacement 20 years ago following an episode of infective endocarditis. Neurosurgery, to evacuate a subdural hematoma, had occurred 4 months earlier with warfarin reversal. In the period following neurosurgery, INR levels had been below <2.5 and there had been no bridging heparin.

Urgent transthoracic ultrasound demonstrated severely elevated mitral valve haemodynamics with a mean gradient of 23 mmHg, E peak velocity of 2.9 m/s (Panel A). The aortic valve VTI was low at 13 cm. The mitral valve index (MV VTI/AV VTI) was elevated at 7.1, with an MVA of 0.6 cm². In the two-chamber apical images mechanical valve occluder motion was restricted with echogenic material present on the valve (Panel B and Supplementary data online, Video S1). Thrombus was strongly suspected with severe valve obstruction.

3D TEE demonstrated a ‘stuck’ mitral valve with bileaflet obstruction due to adherent sessile thrombus at 12 o’clock (superior) aspect of the leaflets. 3D TEE imaging demonstrates anti-anatomical orientation of the MVR. At the 6 o’clock (inferior) aspect of the mitral ring a second thrombus was present (Panel C and Supplementary data online, Video S2). This was confirmed at the time of operation. After surgical removal of the valve, organized thrombus was confirmed (Panel D). This case nicely highlights the anatomical and spatial accuracy of 3D TEE (Panel C). A 29 mm mosaic mitral valve bio-prosthesis was inserted. The patient was reviewed 2 months post-operatively and is well.

3D TEE may improve the characterization, location, and assessment of prosthetic valve thrombus burden to guide management decisions.

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.