Myocardial abscess: a rare complication of valvular endocarditis demonstrated by 3D contrast echocardiography

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Myocardial abscess is a rare and often fatal complication of valvular endocarditis. We present a case of a patient with aortic valve endocarditis whose post-operative course was complicated by a large left ventricular abscess. The spatial location of the defect was difficult to assess with 2D transthoracic echocardiography (TTE); however, real-time 3D contrast TTE allowed us to visualize the full extent of the defect and its precise anatomical location, prior to successful surgical resection.

Keywords

Myocardial abscess • Infective endocarditis • 3D echocardiography • Contrast echocardiography

A 44-year-old male with no previous medical history presented to his local hospital with confusion and fever. Computed tomography head scan revealed a brain abscess, and he was subsequently transferred to the neurology department of our institution for further management. On arrival he was found to be in sinus tachycardia (110 bpm) with a diastolic murmur, Roth spots, Janeway lesions, and multiple splinter haemorrhages.

Infective endocarditis was suspected and a transthoracic echocardiogram (TTE) was performed. This revealed a large mobile mass attached to the aortic valve, resulting in severe aortic regurgitation and a dilated, hyperdynamic left ventricle. Blood cultures grew Group C streptococcus and multiple infective emboli affecting his brain, liver, kidney, and spleen were found on diagnostic imaging. The patient was taken to operating theatre and underwent emergency bioprosthetic aortic valve replacement.

Although on intravenous antibiotics post-operatively, the patient’s inflammatory markers were slow to settle, and echocardiography now showed a small cavity in the infero-apical wall. In the context of recent valvular infective endocarditis associated with multiple septic emboli, it was thought that the cavity was in fact a myocardial abscess. Over the following 3 weeks, serial TTEs (see Figures 1 and 2) using contrast and 3D demonstrated increasing size, communication with the left ventricular cavity, and a pulsatile nature. In addition, a new mild-to-moderate paravalvar leak was noted.

With a high risk of rupturing into the pericardium or right ventricle, the patient was taken back to the operating theatre for a redo sternotomy, which confirmed the presence of a large infero-apical cavity or aneurysm measuring $6 \times 5 \times 3$ cm, with a narrow neck into the left ventricle. The aneurysm was resected and patched (Figure 3). A replacement aortic bioprosthesis was also inserted.

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Figure 2 2D transthoracic echocardiography using contrast for enhanced border definition of the defect. On the left is the apical two-chamber, and on the right is the parasternal short axis. The potential risk of myocardial rupture between the cavity and RV can be seen in this view. LV, left ventricle; RV, right ventricle.

Figure 3 Perioperative photographs showing (A) external view of the myocardial ‘bulge’ caused by the defect; (B) the neck viewed from outside the left ventricle; (C) the myocardial patch attached.

Figure 4 3D contrast (left ventricular opacification) full volume data set.
Discussion

In the context of aortic valve endocarditis, the most recognized location of an associated abscess is the aortic root. The development of a distant myocardial abscess, although documented, is much rarer and often fatal. In the past, most cases were found at autopsy, but improvement in imaging techniques has facilitated the earlier detection of such abnormalities and improved monitoring of their progression. Echocardiography plays a major role in this, particularly with regards to the timing of any surgical intervention.

When imaging a suspected abscess, it is essential to accurately visualize its anatomical location. In standard 2D transthoracic imaging, it is sometimes challenging to clearly visualize the endocardium and, in this particular case, the boundaries of the abscess. Our case demonstrates how the injection of contrast (Figure 2) allows for better border delineation, as well as assessing for any abnormal communications. In addition, the use of real-time 3D contrast echocardiography allows for further spatial orientation (Figure 4). When using a 3D contrast data set in a multiplane reconstruction viewer (Figure 5), the image can be manipulated to show the full extent of the defect from multiple simultaneous views. In addition, careful manipulation of the data can reveal the area of the neck of the abscess (Figure 5B), a view that would be impossible to recreate through 2D echocardiography alone. Even volumetric quantification of the abscess is possible (Figure 6). Owing to the high-risk nature of these cases, accurate imaging of the location and proximity to its surrounding anatomical structures is essential and likely to prove very useful to the cardiothoracic surgeons.
Supplementary data

Supplementary data are available at European Journal of Echocardiography online.

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