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## IMAGES IN CARDIOVASCULAR MEDICINE

# Progressive breathlessness post mitral valve replacement



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### KEYWORDS

Paravalvular leak;  
Mitral valve replacement;  
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**Abstract** Paravalvular leak occurs in 1–5% patients following surgical valve replacement and is associated with complications including haemolysis, heart failure and endocarditis. Re-do surgery is difficult with mortality rates approaching 16%. Percutaneous closure of mitral valve leaks with occluder devices is a viable alternative to repeat sternotomy; however, clinicians should be aware of contra-indications which include active endocarditis. Management of paravalvular leak is complex and success requires multi-disciplinary approach with cardiothoracic surgeons, clinical, imaging and interventional cardiologists.

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A 61-year-old gentleman presented to hospital with fatigue and marked exertional dyspnoea (NYHA class III). He had undergone mitral valve replacement the previous year for severe mitral regurgitation with a size 33 mm CarboMedics prosthesis. In childhood he had undergone surgical repair of a secundum atrial septal defect.

On examination he was haemodynamically stable and in controlled atrial fibrillation. Auscultation revealed a prosthetic first heart sound and a normal second heart sound, and a grade 2/6 pansystolic murmur with a grade 1/6 diastolic murmur. The patient was euvoelaemic and with a normal respiratory system examination.

Chest radiograph demonstrated cardiomegaly but no pulmonary venous congestion. Electrocardiogram confirmed controlled atrial fibrillation. C-reactive protein was elevated at 60 mg/L although he was not overtly septic. Bilirubin was

33 µmol/l and haemoglobin concentration of 109 g/L so valvular haemolysis was considered.

During the admission the patient became febrile. Multiple blood cultures grew a methicillin sensitive staphylococcus aureus. The patient proceeded to transoesophageal echocardiography (TOE) which confirmed a small vegetation on the sewing ring but also demonstrated significant paravalvular regurgitation.

Live 3-D reconstruction allowed the exact size and shape of the leak to be identified as percutaneous approach to paravalvular leak closure was being considered. After multiple multidisciplinary team discussion, the consensus was for a surgical approach to paravalvular leak closure given the recent history of endocarditis. This would also facilitate surgical valve replacement at the time, should it be required (see Figs. 1–3).

Paravalvular leak occurs in 1–5% patients following surgical valve replacement and is associated with complications including haemolysis, heart failure and endocarditis.<sup>1</sup> Paravalvular leak is more likely to occur early following valve replacement, while longer term paravalvular leaks can occur in the setting of endocarditis. Re-do surgery is difficult with mortality rates approaching 16%.<sup>2,3</sup> Percutaneous closure of

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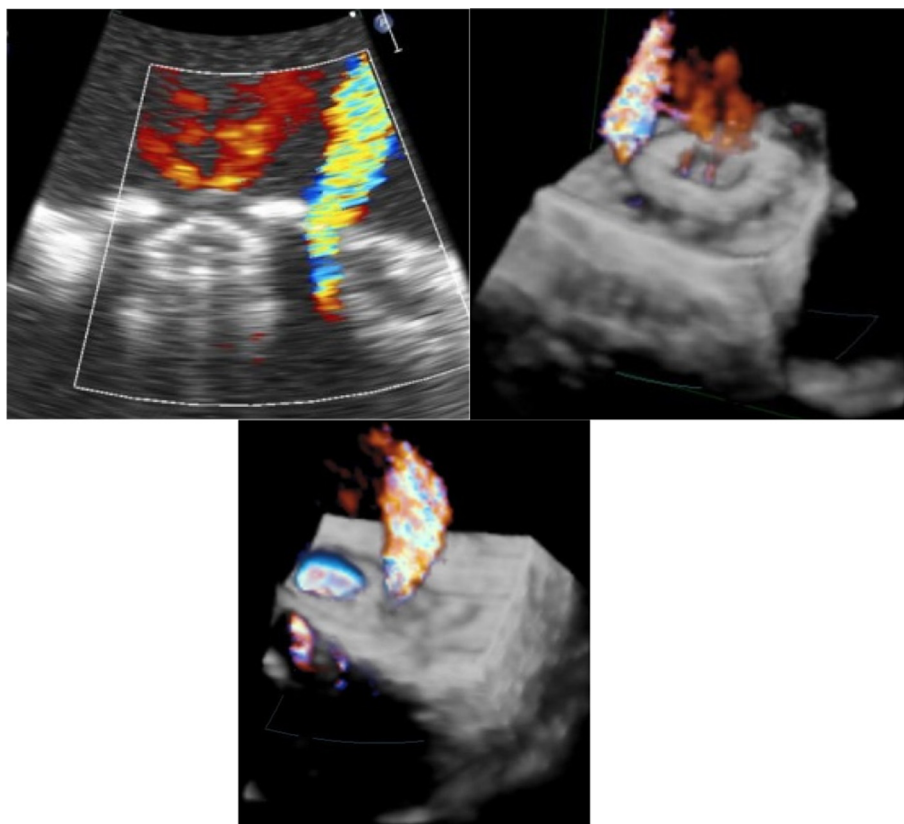
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**Figures 1–3** 1. Colour Doppler TOE view of the mechanical mitral valve at 0°. 2. TOE 3-D live reconstruction of the mitral valve. 3. TOE 3-D reconstruction delineating size and position of paravalvular leak.

mitral valve leaks with occluder devices is a viable alternative to repeat sternotomy; however, clinicians should be aware of contra-indications which include active endocarditis.<sup>4</sup> Management of paravalvular leak is complex and success requires multi-disciplinary approach with cardiothoracic surgeons, clinical, imaging and interventional cardiologists.<sup>5</sup>

#### Conflict of interest

The authors declare that there are no conflict of interests.

#### References

1. Bhindi R, Bull S, Schrale RG, Wilson N, Ormerod OJ. Surgery Insight: percutaneous treatment of prosthetic paravalvular leaks. *Nat Clin Pract Cardiovas Med* 2008;**5**(3):140–7.
2. Echevarria JR, Bernal JM, Rabasa JM, Morales D, Revilla Y, Revuelta JM. Reoperation for bioprosthetic valve dysfunction. A decade of clinical experience. *Eur J Cardiothorac Surg* 1991;**5**:523–6.
3. Malhotra A, Rayner J, Williams TM, Prendergast B. Infective endocarditis: therapeutic options and indications for surgery. *Curr Cardiol Rep* 2014;**16**(4):464.
4. Reed GW, Tuzcu EM, Kapadia SR, Krishnaswamy A. Catheter-based closure of paravalvular leak. *Exp Rev Cardiovasc Therapy* 2014;**12**(6):681–92.
5. Sorajja P, Cabalka AK, Hagler DJ, Rihal CS. Percutaneous repair of paravalvular prosthetic regurgitation: acute and 30-day outcomes in 115 patients. *Circul: Cardiovasc Intervent* 2011;**4**(4):314–21.