Intracardiac echocardiography imaging of periprosthetic valvular regurgitation

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A 62-year-old woman was referred for evaluation of recent-onset dyspnoea at rest and a newly found systolic heart murmur, heard best at the apex of the heart. The patient’s history was notable for surgical mitral valve replacement 3 years ago, due to severe mitral regurgitation (myxomatous degeneration of the mitral valve). The transthoracic echocardiogram gave the impression of a mitral regurgitant jet, but the acoustic shadow of the prosthesis did not allow adequate evaluation of the regurgitation. A transoesophageal echocardiogram was performed showing a normally functioning mitral prosthesis, with a small periprosthetic leak (Figure 1, upper panel), disproportionate to the patient’s symptoms and marked signs of haemolysis. An intracardiac ultrasound study revealed a large paravalvular regurgitant jet, indicating significant periprosthetic regurgitation (Figure 1, lower panel). Intracardiac echocardiography is increasingly being used to guide percutaneous interventions and electrophysiological procedures. The present case suggests a potentially useful widening of the range of intracardiac ultrasound clinical applications, out of the realm of device-closure interventions and electrophysiological procedures. It appears that intracardiac echocardiography could become a second-line alternative to transoesophageal echocardiography, especially in patients with contraindication to the latter.

Keywords

Intracardiac echocardiography • Intracardiac ultrasound • Paravalvular regurgitation • Periprosthetic leak

A 62-year-old woman, hospitalized for acute renal failure, was referred to the Cardiology Department for evaluation of recent-onset dyspnoea at rest and fatigue, despite the improvement of her renal functional status, and a newly found heart murmur. The patient’s history was notable for surgical mitral valve replacement 3 years ago, due to severe mitral regurgitation (myxomatous degeneration of the mitral valve). A bileaflet mechanical prosthesis was implanted at that time. Moreover, 2 months ago, the patient had received a dual-chamber permanent pacemaker, due to advanced heart block.

Cardiovascular physical examination revealed a loud systolic heart murmur, heard best at the apex of the heart, radiating towards the axilla and the parasternal area. Rales were audible at both lung bases. The laboratory work-up showed marked normocytic anaemia (haematocrit 27% and haemoglobin 9.1 mg/dL), with increased reticulocyte count, increased levels of bilirubin (2.4 mg/dL total and 1.9 mg/dL unconjugated), and lactic dehydrogenase (320 U/L), all indicative of intravascular haemolysis. Serum creatinine concentration was 1.5 g/dL.

The transthoracic echocardiogram gave the impression of a mitral regurgitant jet, but the acoustic shadow of the prosthesis did not allow adequate evaluation of the regurgitation. A transoesophageal echocardiogram was performed, by a qualified echocardiography specialist, showing a normally functioning mitral prosthesis, with a small periprosthetic leak (Figure 1, upper panel; see Supplementary data online, Video S1), disproportionate to the patient’s symptoms and marked signs of haemolysis. An intracardiac ultrasound study revealed a large paravalvular regurgitant jet, indicating significant periprosthetic regurgitation (Figure 1, lower panel; see Supplementary data online, Video S2).

Intracardiac echocardiography is increasingly being used to guide percutaneous interventions and electrophysiological procedures.1–3 Its main advantages over transoesophageal echocardiography during interventions are that it eliminates the need for general anaesthesia, affords clearer imaging, shorter procedure times, and reduces hospital stays and radiation doses.4 The present case suggests a potentially useful widening of the range of intracardiac ultrasound clinical applications, out of the realm of device-closure interventions and electrophysiological procedures. It appears that it could become a second-line alternative to transoesophageal echocardiography, especially in patients with contraindication to the latter.

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requiring clearer imaging of valvular function and structure\textsuperscript{5} and especially in those with contraindication to transoesophageal imaging.

**Supplementary data**

Supplementary data are available at *European Journal of Echocardiography* online.

**Conflict of interest:** none declared.

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**References**


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**Figure 1** (Upper panel) Still image from the transoesophageal echocardiography study, showing a small paravalvular leak (*). (Lower panel) Intracardiac echocardiography revealed severe periprosthetic regurgitation, as indicated by the large regurgitant jet (*), which originates at the lateral side of the mitral prosthesis (†). The two images make evident that at least in this case, intravascular ultrasound visualized the periprosthetic leak more adequately than the transoesophageal study, allowing for a better assessment of the severity of the condition and explaining the patient’s clinical status.