



## IMAGE IN CARDIOLOGY

# Left-sided endocarditis extending to the right chambers: Usefulness of three-dimensional echocardiography in preoperative assessment



## Endocardite esquerda com extensão direita: utilidade da ecocardiografia tridimensional na avaliação pré-operatória

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A 35-year-old man was admitted to our hospital because of dyspnea. He had undergone surgery two months before, in another hospital, for replacement of the aortic and mitral valves with mechanical prostheses due to infective endocarditis. No signs of active infection were found. A IV/VI holosystolic murmur was detected at the left sternal border. On transthoracic echocardiography, turbulent flow was observed in the anterior area of the aortic root (AR). Three-dimensional transesophageal echocardiography (3D-TEE) showed a pseudoaneurysm (PA) in the anterior area of the aortic annulus extending to the right atrium (RA) (Figure 1A and B, Video 1). Turbulent flow was detected from the PA to the RA (blue arrow) and to the right ventricle (RV) (yellow arrow), the latter through the base of

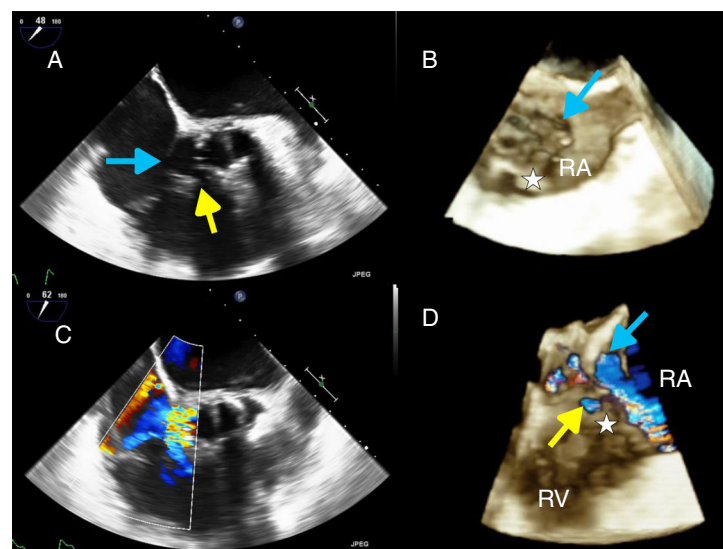
the tricuspid septal leaflet (TSL) (Figure 1C and D, white star).

In the operating room, a small defect was seen in the anterior area of the aortic annulus (Figure 2A). After the RA was opened, a PA communicating with the RA through the perimembranous septum was found (Figure 2B and C). The PA was opened and another defect was seen communicating with the RV through the base of the TSL (Figure 2D). Both defects were repaired with bovine pericardial patches, the TSL was reconstructed and a new mechanical aortic prosthesis was implanted.

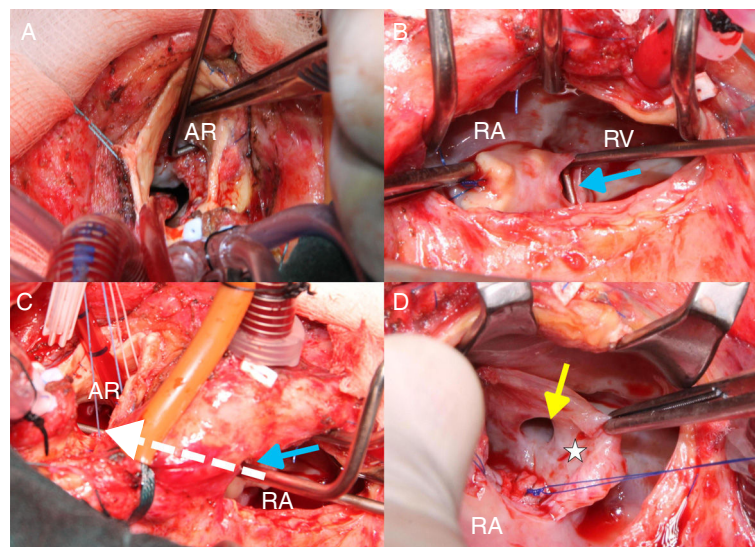
In complex cases of endocarditis, 3D-TEE provides an accurate picture of the anatomical defects, which enables optimal planning of the surgical strategy.

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**Figure 1** Transesophageal echocardiography in mid-esophageal view: (A) two-dimensional transesophageal echocardiography (2D-TEE) showing a cavity between the aortic prosthesis and the right atrium RA corresponding to a PA, which communicates with the RA (blue arrow) and with the RV through the base of the TSL (yellow arrow); (B) three-dimensional transesophageal echocardiography (3D-TEE), showing the PA from the RA in the middle of the image, the aortic prosthesis on the left, the superior vena cava on the right, the interatrial septum at the top and the TSL at the bottom; (C) 2D-TEE showing turbulent flow from the PA to the RA and to the RV; (D) 3D-TEE image showing the same defects in more detail. PA: pseudoaneurysm; RA: right atrium; RV: right ventricle; TSL: tricuspid septal leaflet.



**Figure 2** Surgical photographs: (A) a small defect in the anterior area of the aortic annulus; (B) the PA with a previous pericardial patch after the RA was opened; (C) a defect communicating with the perimembranous septum (blue arrow); (D) the PA after being opened with a defect communicating with the RV (yellow arrow) through the base of the TSL (white star). PA: pseudoaneurysm; RA: right atrium; RV: right ventricle; TSL: tricuspid septal leaflet.

## Ethical disclosures

**Protection of human and animal subjects.** The authors declare that no experiments were performed on humans or animals for this study.

**Confidentiality of data.** The authors declare that no patient data appear in this article.

**Right to privacy and informed consent.** The authors declare that no patient data appear in this article.

## Conflicts of interest

The authors have no conflicts of interest to declare.

## Appendix A. Supplementary data

Supplementary material associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.repc.2016.04.019>