

IMAGE FOCUS

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Real-time three-dimensional transoesophageal echocardiography enables preoperative pulmonary valvulopathy assessment

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A 60-year-old male with carcinoid syndrome was referred for the evaluation of carcinoid heart disease. Transthoracic echocardiography (TTE) demonstrated thickened, fixed, and retracted leaflets of the tricuspid valve (TV) with severe tricuspid regurgitation (Panels A and B). The pulmonic valve (PV) was not well seen on TTE. Surgical valve replacement to preserve right ventricular function was recommended. Two-dimensional (Panels D and E) and real-time three-dimensional (3D) transoesophageal echocardiography (TEE) were performed to evaluate for carcinoid involvement of the PV, which was not adequately visualized by TTE.

An *en face* view of the PV from the arterial perspective revealed three thickened and retracted PV leaflets with severe pulmonic regurgitation (Panels E and F, and see Supplementary data online, Video S1). Three-dimensional TEE of the TV demonstrated the diffuse carcinoid involvement with severe TV regurgitation (Panel C and see Supplementary data online, Video S2). These findings were confirmed at surgery, and the patient underwent successful TV and PV replacement without complication.

Carcinoid tumours are rare neuroendocrine tumours. Carcinoid heart disease is a major source of morbidity and mortality. Cardiac surgery is the definitive treatment for heart failure symptoms. TTE is used in the diagnostic evaluation of carcinoid heart disease, providing multiple views of each valve, as well as assessment of the ventricular size and function. If the PV is not well visualized on TTE or 2D TEE, 3D TEE can allow for an *en face* visualization of all the PV leaflets, which can allow for proper surgical planning and risk assessment. Collectively, for patients with pulmonary valvulopathy, 3D TEE may be the imaging modality of choice.

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

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