


CARDIOVASCULAR FLASHLIGHT

Real-time three-dimensional transoesophageal echocardiography for guidance of interventional closure of paravalvular leakage

Christoph Hammerstingl*, Lars Lickfett, and Georg Nickenig

Department of Cardiology and Pneumology, Medizinische Klinik II, Universitätsklinikum Bonn, Sigmund-Freud Strasse 25, 53105 Bonn, Germany

* Corresponding author. Tel: +49 228 2871 6137, Fax: +49 228 2871 4907, Email: christoph.hammerstingl@ukb.uni-bonn.de

A 69-year-old female presented with increasing dyspnoea NYHA classes III–IV and peripheral cyanosis 10 years after mechanical mitral valve replacement (St Jude Medical, 27 mm) of a degenerated bioprosthesis. Transoesophageal echocardiography (TEE) revealed severe paravalvular leakage of the mitral valve prosthesis (Panel A, colour Doppler jet indicating paravalvular regurgitation volume with apparent dehiscence). Repeated open heart surgery was declined because of concomitant severe pulmonary artery hypertension and co-morbidities. Therefore, interventional closure of the defect with the Amplatzer™ Vascular Plug III device (AGA Medical Corporation, Plymouth, USA) was planned. We used the novel matrix array three-dimensional (3D) TEE probe (X7-2t, Philips Medical Systems) for accurate defect localization (Panel B, white arrow indicating the defect close to the mitral valve annulus) and peri-interventional real time catheter guidance. After trans-femoral access, the guide wire was positioned retrograde across the leakage and pulled into a trans-septal sheath by a snare catheter for stabilization (Panel C). 3D TEE confirmed correct catheter position (Panel D). After unfolding the left atrial proportion of the Plug-device, correct positioning of the oval-shaped disc in relation to the mitral valve leaflets was ensured by 3D TEE before definite release (Panels E and F). Fluoroscopy alone failed to certify accurate positioning of the Plug. Post-procedurally, the patient’s functional capacity increased markedly (NYHA classes II–III) with a reduction in peripheral cyanosis.

We here show that the application of real-time 3D TEE is feasible and extremely helpful for the guidance of percutaneous transcatheter closure of a paravalvular leakage after mechanical mitral valve replacement. Because of excellent real-time 3D visualization with high spatial resolution, 3D TEE technique has the potential to increase the safety and efficacy of such complex intracardial procedures.

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