Use of three-dimensional echocardiography for monitoring of tricuspid valve endocarditis treatment with a novel extracellular matrix cylinder reconstruction

Ewa Szymczyk1, Tomasz Kaszczyński2, Grzegorz Religa2, Piotr Lipiec1, Jarosław D. Kasprzak1

1Department of Cardiology, Medical University of Lodz, Lodz, Poland
2Department of Cardiac Surgery, Bieganski Hospital, Lodz, Poland

A 36-year-old women, HIV, HBV and HCV infected, with long term intravenous drug addict and chronic kidney disease was admitted with symptoms of respiratory tract infection and 40°C fever. Blood cultures identified methicillin-sensitive Staphylococcus aureus bacteremia. Transthoracic echocardiography revealed a large (9 × 3 cm size), mobile, polycyclic vegetation on tricuspid valve with severe valve regurgitation (Fig. 1A). Critically ill patient was qualified for urgent, life-saving surgical tricuspid valve replacement with novel technique. Based on preoperative three-dimensional (3D) echocardiographic measurements (Fig. 1B), 32-mm cylinder was formed from a single sheet of commercially available extracellular matrix (CorMatrix™) to create a custom tricuspid valve prosthesis which was sewn to the tricuspid annulus and tacked with pledged suture to the right ventricular free wall, anterior and posterior papillary muscles (Fig. 1C, D). Intraoperative transoesophageal echocardiography showed normal antegrade flow without tricuspid regurgitation and normal postoperative right ventricular function (Fig. 1E, F). Current commercially available valve prostheses are suboptimal for tricuspid position due to thrombotic risk and in case of our patient with drug addiction — specific reinfection and anticoagulant compliance problems. The use of CorMatrix™ — acellular bioscaffold with potential for native valve tissue regeneration, as a material for tricuspid valve repair allows creating a fully functional valve and represents a promising approach for treatment of right heart endocarditis, and 3D echocardiography is optimal for procedural planning and monitoring.