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A 3D transesophageal echo-facilitated diagnosis and cryoballoon ablation of paroxysmal atrial fibrillation in a patient with cor triatriatum sinister

Short title: AF cryoablation in cor triatriatum

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A 58-year old male patient with a history of highly symptomatic paroxysmal atrial fibrillation (AF) and documented concomitant atrial flutter (AFL), hypertension and obesity was scheduled for cryoballoon ablation (CB). Six months prior he had undergone a cavo-tricuspid isthmus ablation (CTI) in a different centre. At that time he was originally scheduled for AF ablation but the operator was discouraged from transseptal puncture due to a linear structure of an unknown origin diagnosed in the left atrium during pre-procedural 2D transesophageal echocardiography (TEE).

Transthoracic echocardiography (TTE) performed in our centre revealed normal left ventricular ejection fraction (LVEF 60%), mildly dilated left atrium (LA area 22 cm^2), functionally bicuspid aortic valve with moderate stenosis (aortic valve area 1.1–1.2 cm^2, gradient 36/16 mm Hg) and mild regurgitation. On a day of the procedure the patient had sinus rhythm. A 3D TEE (Philips Epiq 7) performed in the cathlab revealed a benign form of cor

triatriatum sinister. A membrane located between interatrial septum and the ridge between left atrial appendage and left superior pulmonary vein with a significant opening in the middle was found, dividing partially the cavity of LA into posterosuperior part containing pulmonary veins' ostia and the anteroinferior part that provided the actual mitral inflow (Figure 1A and B, Supplementary materials, *Video S1* and *S2*). A TEE-guided transseptal puncture was performed aiming at the pulmonary vein compartment of LA (Figure 1C–F, Supplementary materials, *Video S3*) and CB of AF was safely performed (Supplementary materials, *Table S1*, *Figure S1*). The patient was discharged next day without complications.

Cor triatriatum is an extremely rare heart defect comprising less than 0.4% of all congenital heart diseases [1]. The symptoms depend on the connection between both LA compartments. Usually the mitral inflow is severely obstructed and patients require surgery in an infantile age. However, sometimes there is a wide opening in the membrane and patients remain asymptomatic for many years and may get diagnosed accidentally as in our case. According to Karimianopur et al. [2] such phenomenon takes place in one in thousand AF ablations.

CB is a well-recognized and widely utilized procedure of AF ablation in Poland [3]. It has been demonstrated that this single-shot ablation was feasible and safe to perform in patients with anatomical variabilities of the LA [4]. The important role of 3D TEE in interventional cardiology has also been previously reported [5].

We would like to emphasize that in this case a 3D/2D TEE allowed for proper diagnosis and safe conduction of the pulmonary vein isolation using a cryoballoon in a patient with a benign form of triatrial heart without need for other preprocedural cardiac imaging including contrast-enhanced computed tomography.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska

Article information

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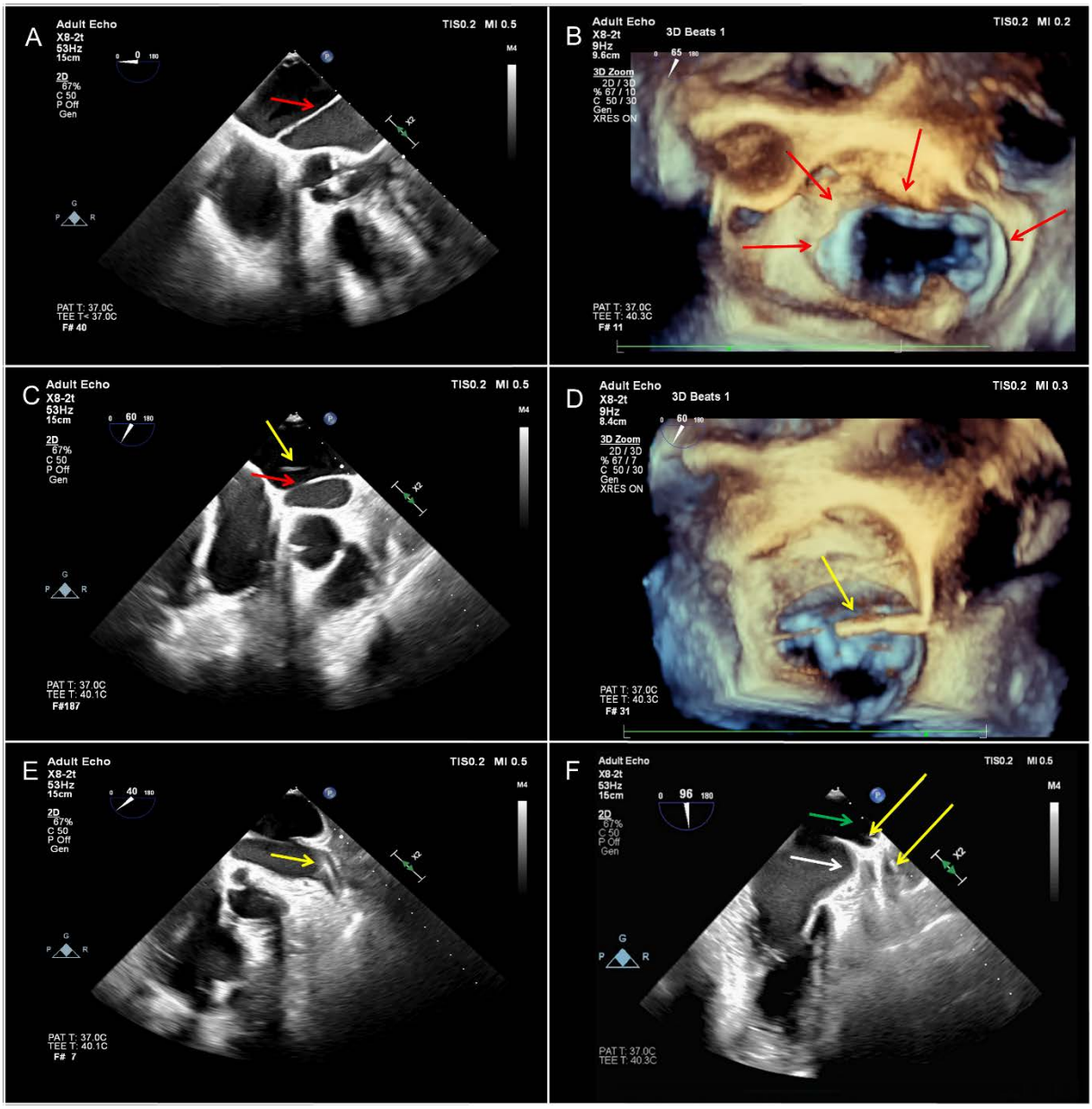

Figure 1. A 2D/3D transesophageal echocardiography (TEE) images of the membrane in the left atrium and transseptal puncture. **A.** A 2D TEE midesophageal (ME) five-chamber view of the left atrium membrane (red arrow). **B.** A 3D TEE image of the left atrium membrane (red arrows) with mitral valve leafleats in the background. **C.** A 2D TEE ME aortic valve short axis view of the guide wire (yellow arrow) in the posterior compartment of the left atrium, behind the membrane (red arrow). **D.** 3D TEE image of the transseptal sheath and guide wire (foreground, yellow arrow) over the left atrial membrane and mitral valve (background). **E.** A 2D TEE ME two-chamber view of the guide wire (yellow arrow) in the anterior compartment of the left atrium heading towards the left atrial appendage. **F.** A 2D TEE ME two-chamber view of the guide wire (yellow arrows) in the posterior compartment of the left atrium (green

arrow) heading towards the left superior pulmonary vein. White arrow indicates anterior compartment of the left atrium with the appendage