

CLINICAL VIGNETTE

Percutaneous mitral and tricuspid valve repair using edge-to-edge technique

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A 63-year-old man with a history of dyspnoea, New York Heart Association (NYHA) class III heart failure (HF) due to reduced ejection fraction (EF), with concomitant severe mitral (MR) and tricuspid regurgitation (TR), was admitted to hospital for the treatment of valvular heart disease. The patient, diagnosed with chronic kidney disease (category G3b) in 2003, was treated with fibrinolysis because of inferior wall and right ventricular myocardial infarction. Subsequently, in 2003 and 2017 he underwent angioplasty of the right coronary artery (RCA). Moreover, because of recurrent ventricular tachycardia he had a implantable cardioverter-defibrillator (ICD) implanted in 2003. Despite optimal medical therapy, during the previous 12 months the patient experienced two episodes of HF worsening, requiring hospitalisation and intravenous diuretic use. Transthoracic echocardiography (TTE) confirmed moderate impairment of left ventricular function (LVDD 62 mm; EF 38%), the presence of severe functional MR (ERO 0.26 cm², MRvol 36 mL), concomitant secondary TR, and inferior vena cava dilatation. TR had a total vena contracta area (VCA) of 0.5 cm² and was built of two jets: the first caused by an ICD lead (VCA₁ — 0.28 cm²) and the second localised between septal and anterior leaflets (VCA₂ — 0.22 cm²). Right atrial (RA) area was 48 cm² and tricuspid valve (TV) annulus diameter was 48 mm. In transoesophageal echocardiography (TEE) examination, the patient was found to be amenable to percutaneous mitral valve repair. Coronary angiography showed a sustained result of the RCA stent implantation. Because of the high predicted risk of conventional surgical treatment (EuroSCORE II 5.53%), percutaneous therapy with the MitraClip system was planned. Furthermore, the quality of the obtained images, allowing a detailed visualisation of the TV, encouraged the attempt to treat both valvular pathologies simultaneously. The procedure was performed under TEE guidance. Two MitraClip devices were implanted in the mitral valve A2/P2 area, which caused almost complete disappearance of the regurgitation jet. After the retrieval of a steerable sheath to the RA an additional clip was implanted between the anterior and septal TV leaflets, leading to a reduction of tricuspid insufficiency (Fig. 1A, B). VCA₂ was closed, and VCA₁ was reduced to 0.22 cm² (Fig. 2A, B). The following hospitalisation was uneventful, and the patient was ambulated four days after the procedure. During the four weeks after hospital discharge the patient remained in NYHA class I and the follow-up TTE and TEE examinations showed a sustained result of the percutaneous treatment with mild MR (ERO 0.1 cm², MRvol. 0.12 mL).

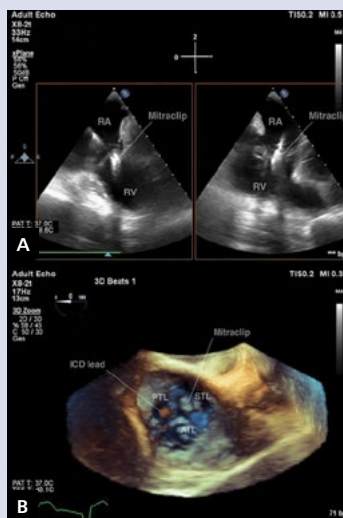


Figure 1. **A.** Transoesophageal echocardiography (TEE), bi-plane, low oesophageal view. MitraClip on septal and anterior tricuspid valve (TV) leaflets; **B.** TV in three-dimensional TEE, low oesophageal en-face view. MitraClip released from the delivery system on septal and anterior TV leaflets; ICD — implantable cardioverter defibrillator; RA — right atrium; RV — right ventricle

A persistent effect of the tricuspid procedure was also confirmed: regurgitation was reduced to moderate with the reduction of RA area (30 cm²) and TV annulus diameter (42 mm). According to the current European Society of Cardiology (ESC) guidelines for the management of valvular heart disease, a percutaneous edge-to-edge procedure may be considered in patients with severe secondary MR, who remain symptomatic despite optimal medical management. This therapy already plays an important role in the treatment of the high surgical risk population. However, in many patients diagnosed with severe mitral insufficiency, a concomitant severe secondary TR is observed. The presence of this pathology is considered as a predictor of a negative outcome in patients undergoing both surgical and percutaneous treatment of MR [1]. Therefore, ESC guidelines underline the need for simultaneous surgical repair of TV in patients with a severe secondary TR undergoing left-sided valve surgery. Although data on percutaneous edge-to-edge repair of TV are scant, preliminary reports indicate that this procedure might be safe and effective in selected patients [2]. The presented case describes, to the best of our knowledge, the first successful simultaneous treatment of MR and TR with the percutaneous edge-to-edge procedure carried out in Poland.

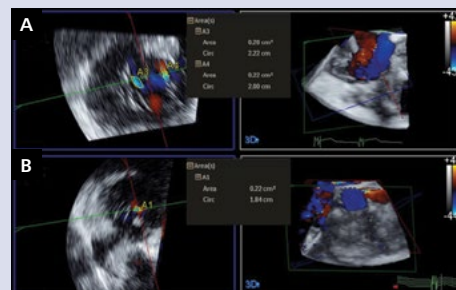


Figure 2. Three-dimensional transoesophageal echocardiography (TEE), low oesophageal view; **A.** Vena contracta area (VCA) planimetry of pre-procedural tricuspid regurgitation (TR), two jets: VCA₁ (A3) — 0.28 cm², VCA₂ (A4) — 0.22 cm²; **B.** Postprocedural TR jet: VCA₁ (A1) — 0.22 cm²

References

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Conflict of interest: none declared

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