

# The percutaneous embolization of the coronary artery fistula after edge-to-edge repair of mitral and tricuspid valve regurgitation

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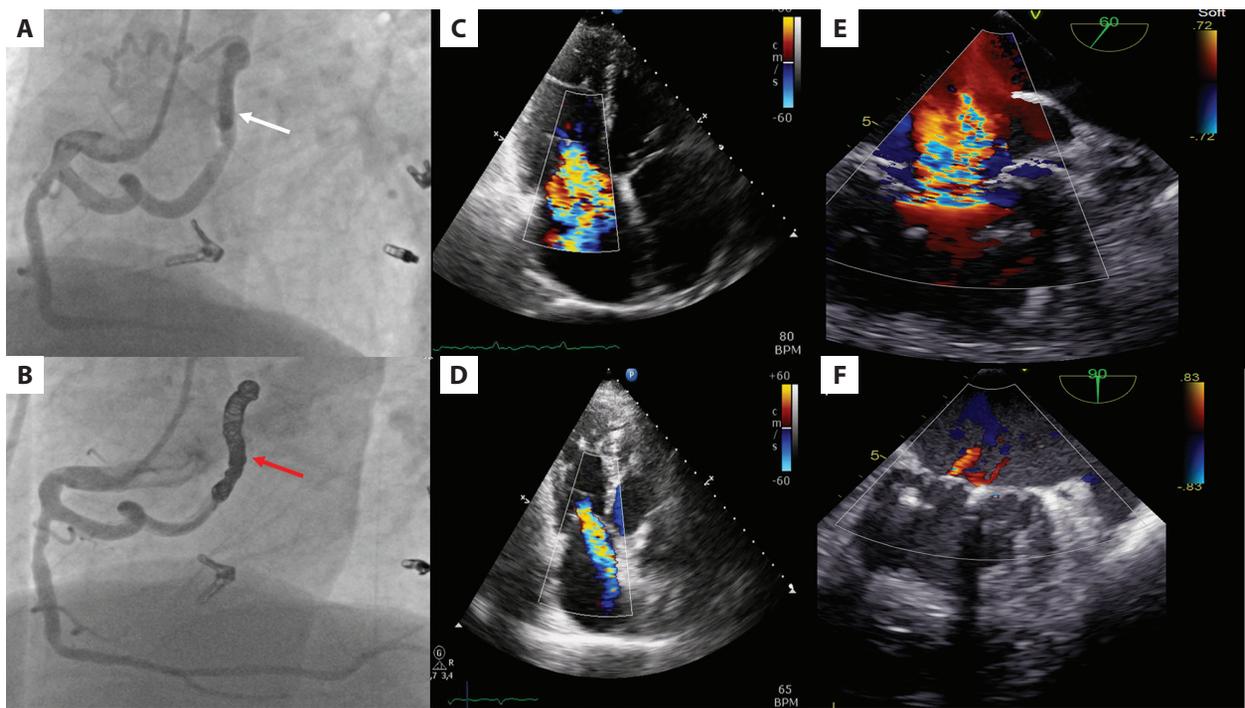
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Mitral regurgitation (MR) is the second most common valve dysfunction and coexists with tricuspid regurgitation (TR) in 30%–50% of patients [1]. Transcatheter edge-to-edge repair may improve symptoms and prognosis in selected patients with MR and TR [2, 3]. A 67-year-old male with congestive heart failure (functional New York Heart Association [NYHA] class IV) was referred for the evaluation of severe MR and TR. On admission, the patient presented with dyspnea during minimal exertion, moderate peripheral edema, and malaise despite optimal medical therapy. The patient's history included the prior percutaneous coronary intervention of the right coronary artery, arterial hypertension, permanent atrial fibrillation, and chronic obstructive pulmonary disease. During the previous year, the patient was hospitalized three times for heart failure worsening. The coronary angiogram did not show obstructive lesions and revealed a moderate size (diameter of 5 mm) fistula between the right coronary artery and superior vena cava (Figure 1A–B). Transthoracic echocardiography (TTE) documented reduced left ventricular ejection fraction (LVEF) of 40%, right ventricular dysfunction (tricuspid annular plane systolic excursion, 14 mm), both atrial enlargement and severe functional MR and TR (Figure 1C and E). Following Heart Team evaluation, the patient underwent the MitraClip implantation on both mitral (two NTR devices) and tricuspid valve (one XTR device). The procedure on the mitral valve was successful with satisfactory MR reduction (Figure 1F). Unfortunately, the single leaflet detachment of the XTR device

implanted on the tricuspid valve occurred, and no TR reduction was achieved. Following the procedure, the patient was still symptomatic in NYHA class IV and with peripheral edema despite intensive diuretic therapy. Transthoracic echocardiography showed LVEF reduced to 20%, mild residual MR with a mean mitral gradient (MMG) of 3.5 mm Hg and severe TR. In an attempt to reduce the right ventricular preload, the previously found coronary fistula was closed with 5 Concerto Helix coils. Within a few days after the procedure, the patient's condition improved: his exercise tolerance increased and peripheral edema disappeared. The repeated TTE on day 5 after fistula closure showed a stable result of the MitraClip implantation in the mitral position and a TR decrease to the moderate grade (Figure 1D). The patient was discharged home in functional class NYHA II. At 3-month follow-up, the patient remained in NYHA class II and was free of peripheral edema. TTE showed stable LVEF of 40%–45%, mild MR with the MMG of 2.9 mm Hg. The MitraClip XTR remained attached to the septal leaflet of the tricuspid valve only. However, there was only moderate TR detected. The transient LVEF decrease occurs in patients immediately after a successful MitraClip procedure and according to the recent guidelines issued by the American Society of Echocardiography, should be regarded as a sign of a significant MR reduction [4]. The observed TR reduction, despite failed edge-to-edge procedure, could have two potential causes: (1) successful MR treatment; and (2) fistula closure that reduced volume overload of the right ventricle.



**Figure 1.** Pre- and postprocedural angiography and echocardiography images. **A–B.** Immediately pre and post-procedural angiography of the right coronary artery with fistula draining into the superior vena cava (the arrows). **C.** TR after failed TEER procedure. **D.** TR after fistula closure. **E.** MR before TEER. **F.** MR after TEER. The white arrow indicates the fistula immediately before closure. The red arrow indicates a closed fistula

Abbreviations: MR, mitral regurgitation; TEER, transcatheter edge to edge repair; TR, tricuspid regurgitation

### Article information

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