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Transcatheter treatment of multivalvular heart disease

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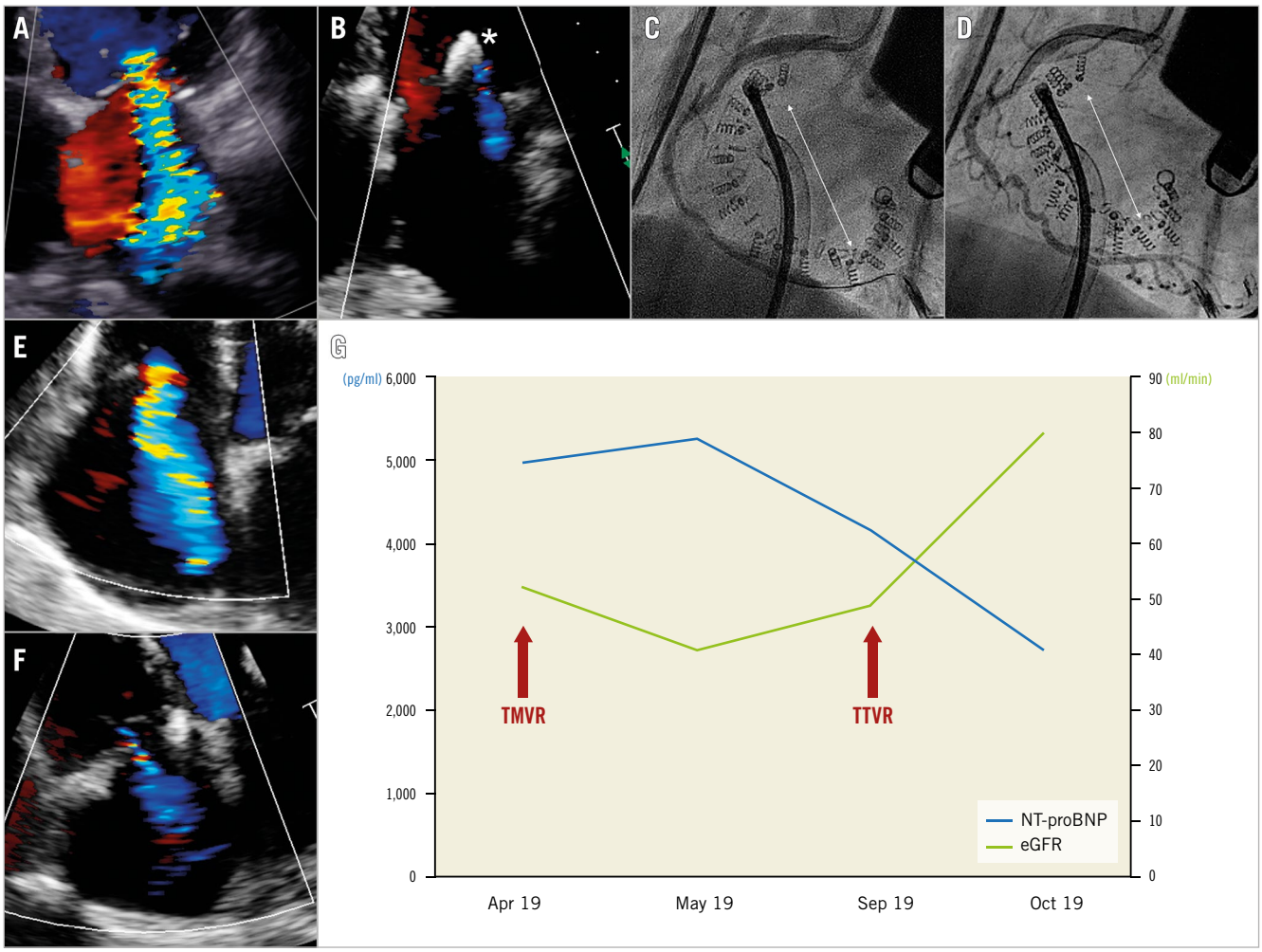

Figure 1. *Transcatheter treatment of multivalvular disease. A) Baseline severe MR, transthoracic echocardiography. B) Result after implantation of one PASCAL device (asterisk) with mild residual MR. C) Transcatheter tricuspid direct annuloplasty with a Cardioband after placement of 17 screws before (2D diameter 4.1 cm) and (D) after (2D diameter 3.2 cm) cinching of the annulus (arrow: approximate annular diameter). E) Baseline TR, transthoracic echocardiography. F) Result after annuloplasty with residual TR grade 1+. G) Evolution of NT-proBNP (pg/ml) and eGFR (ml/min) at the time of transcatheter mitral valve repair (TMVR), follow-up, transcatheter tricuspid valve repair (TTVR) and 30 days after both procedures.*

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A 78-year-old female patient with multivalvular heart disease and previous biventricular cardiac decompensation was referred for treatment. Echocardiography revealed moderate-to-severe primary mitral regurgitation (MR) (vena contracta [VC] 7.5 mm) **(Figure 1A)**, as well as secondary severe tricuspid regurgitation (TR) (VC 7.2 mm, hepatic systolic backflow) **(Figure 1E)**. Left ventricular function was moderately impaired (left ventricular ejection fraction [LVEF] 35%) with normal dimensions and no coronary artery disease. The right ventricle showed mild dilation and dysfunction. The EuroSCORE II of 4.3% was indicative of increased surgical risk, so that, respecting the patient's preference, a percutaneous approach was selected by the Heart Team.

A two-step approach with treatment of the mitral valve first was chosen to address the recent left heart decompensation and account for possible improvement of TR after correction of MR. The patient underwent transcatheter mitral valve repair with one PASCAL implant (Edwards Lifesciences, Irvine, CA, USA) **(Figure 1B)**, reducing MR severity to mild without stenosis (mean gradient [mGd] 3 mmHg). Despite a sustained good result on the mitral side, the patient reported persistent dyspnoea at three months, presumably due to persistent severe TR. In the presence of predominant annular dilation leading to a centrally located TR jet, transcatheter tricuspid annuloplasty using the Cardioband system (Edwards Lifesciences) was performed **(Figure 1C, Figure 1D)**, reducing TR severity to grade 1+ (mGd 2 mmHg) **(Figure 1F)**. At 30 days, the patient was free of symptoms and laboratory examination revealed a significant decrease of NT-proBNP, as well as improvement of kidney function, that were not present after isolated treatment of the mitral valve **(Figure 1G)**.

This case illustrates the combination of different transcatheter techniques to address concomitant disease of the atrioventricular valves. Although economic aspects have to be considered and futility avoided, this case also emphasises the incremental clinical impact of the treatment of concomitant severe TR.

Conflict of interest statement

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