

IMAGES IN INTERVENTION

Percutaneous Direct Annuloplasty With Cardioband to Treat Recurrent Mitral Regurgitation After MitraClip Implantation



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A 74-year-old man was referred for worsening symptoms of left-sided heart failure (New York Heart Association functional class III) 1 year after undergoing an edge-to-edge repair with 2 MitraClips (Abbott Vascular, Santa Clara, California) for functional mitral regurgitation (FMR) at another institution (Figure 1A). His history included ischemic cardiomyopathy, previous coronary bypass surgery, and implantable cardioverter-defibrillator placement. Transesophageal echocardiography confirmed severe left ventricular dysfunction (ejection fraction 35%), severe pulmonary hypertension, marked mitral annular dilation (Figure 1B), and severe FMR with multiple jets originating from between the clips and both anterolateral and posteromedial orifices (Figure 1C). In an attempt to reduce the FMR, reducing annular dilation and increasing leaflet coaptation and thus to alleviate the patient's symptoms, we performed direct annuloplasty with the Cardioband system (Valtech Cardio, Or Yehuda, Israel) (1). The Cardioband was implanted using a transfemoral-transseptal approach on the posterior annulus from the anterolateral to posteromedial commissure using 16 anchors (Figures 1D and 1E). The implant was cinched, resulting in significant reduction in annular

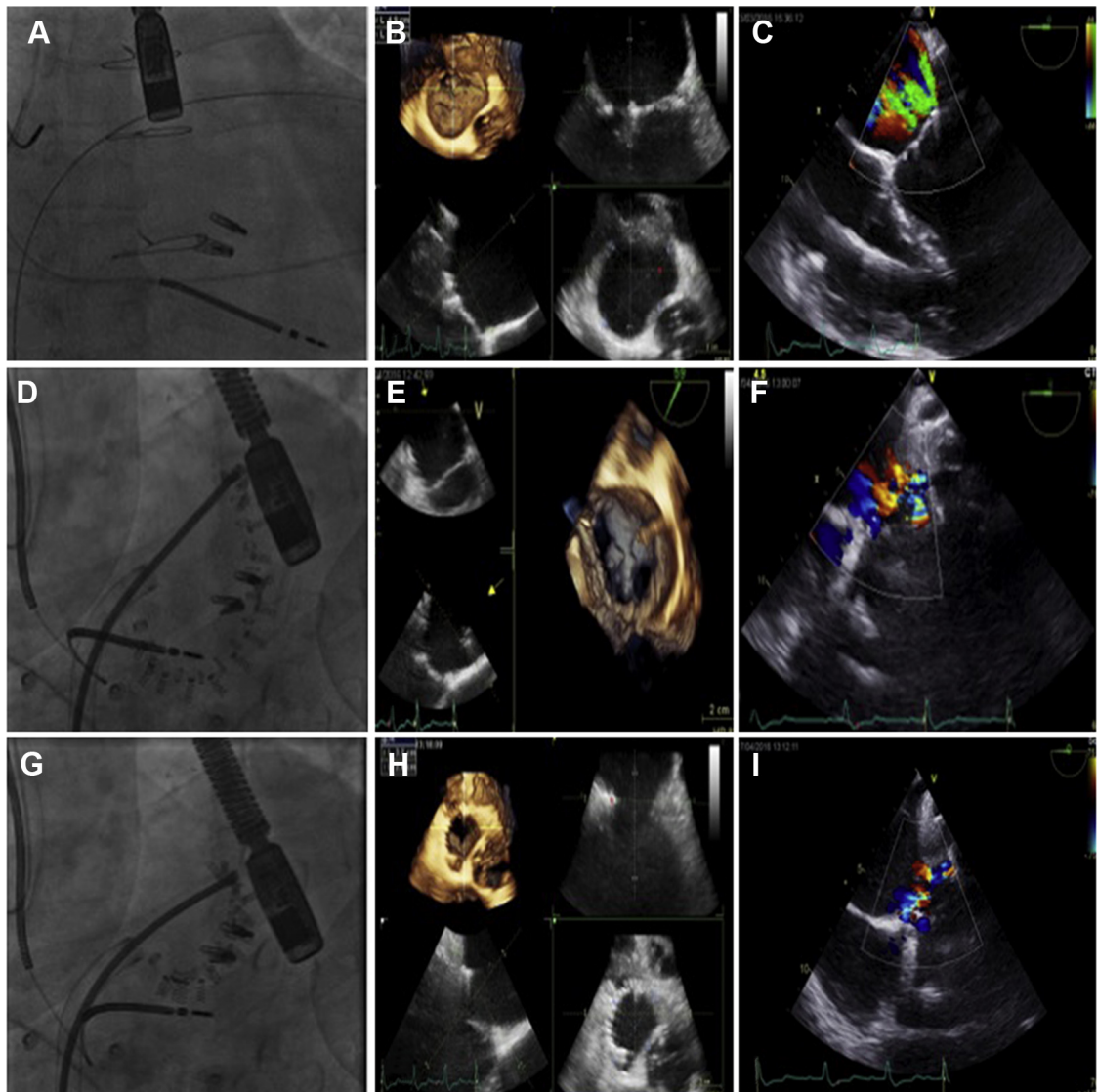
diameters (Figures 1G and 1H) and marked reduction in FMR (Figure 1I).

The current report demonstrates the feasibility of percutaneous direct annuloplasty as a treatment option in patients with FMR treated with the MitraClip presenting with persistent annular dilation and recurrent mitral regurgitation. Direct annuloplasty after MitraClip placement presents challenges with regard to imaging caused by artifacts and the immobility of the posterior leaflet, which makes it difficult to distinguish the hinge point of the leaflet and thus the annulus from the leaflet. This case also highlights the possibility of performing a fully percutaneous mitral valve repair (edge-to-edge plus annuloplasty) and thus surgical-type correction of FMR. However, from a practical and theoretical perspective, direct annuloplasty should be performed before MitraClip placement, as it may facilitate leaflet grasping and reduce the risk for recurrent mitral regurgitation.

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Manuscript received May 31, 2016; revised manuscript received June 13, 2016, accepted June 20, 2016.

FIGURE 1 Fluoroscopic and Echocardiographic Imaging of Cardioband Implantation in a Patient With Previous MitraClip

(A) Baseline fluoroscopic view showing the previously implanted MitraClips. **(B)** Baseline 3-dimensional transesophageal echocardiography (TEE) showing severe annular dilation (49×37 mm) and severe functional mitral regurgitation (FMR) with multiple jets **(C)**. **(D)** Fluoroscopy showing 16 anchors before Cardioband cinching. **(E)** 3-dimensional TEE showing the Cardioband (**arrows**) with double-orifice mitral valve. **(F)** FMR after 4.5-cm cinching of the Cardioband was only mildly reduced. At final 5.5-cm cinching, a significant reduction in annular dimensions was evident on both fluoroscopy **(G)** and echocardiography **(H)** (final annular dimension 37×28 mm), together with a significant reduction in FMR **(I)**.

REFERENCE

1. Maisano F, Taramasso M, Nickenig G, *et al.* Cardioband, a transcatheter surgical-like direct mitral valve annuloplasty system: early results of the feasibility trial. *Eur Heart J* 2016;37:817-25.

KEY WORDS cardioband, direct annuloplasty, functional mitral regurgitation, MitraClip, transcatheter mitral valve intervention