

Treatment of a patient with primary mitral regurgitation using the Cardioband[®] system

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Received 3 November 2018; accepted 2 May 2019; online publish-ahead-of-print 14 May 2019

A 79-year-old male patient presented with progressive dyspnoea New York Heart Association (NYHA) III. Echocardiography showed a normal left ventricular function (ejection fraction 60%) with severe mitral regurgitation (MR) caused by a prolapse of the P1 and P2 segment of the posterior mitral leaflet (Figure 1A and B). Moreover, there was relevant calcification of the posterior mitral annulus specifically in the P2 segment (Figure 1C). The patient's case was discussed within our interdisciplinary heart team. Interventional treatment was recommended due to the patient's comorbidities with impaired clinical status and high frailty. As genesis of MR was primary, MitraClip[®] implantation was recommended. Because of the anatomy of the valve with a prolapse in the P1/P2 segment difficult leaflet grasping was anticipated. Taking into consideration this complex anatomy, it was recommended to approximate the mitral valve leaflets in a first step by implantation of a Cardioband[®] to facilitate the consecutive MitraClip[®] implantation.

As described previously,¹ the first anchor of the system was implanted close to the leaflet hinge, as anterior as possible in the annulus close to the anterior commissure (Figure 1D). Prior to final anchoring, coronary angiography was carried out to exclude impairment of the left circumflex coronary artery (Figure 1D and E). Subsequently, anchors were sequentially deployed starting close to the leaflet hinge and further embodied the implant into the mitral valve annulus starting from anterolateral and moving to posteromedial (Figure 1D and E). Finally, the annulus was tightened by 4 cm emulating a surgical mitral valve ring annuloplasty. Interestingly, MR was virtually abolished (Figure 1F and G). The patient had post-interventional monitoring on the intensive care unit for 1 day and could be extubated on the day of the procedure. The post-interventional course was without further complications and the patient could be dismissed from the hospital on Day 5 post-intervention. As virtually no MR could be detected on dismissal, further conservative treatment was recommended.

With regard to interventional treatment of MR, MitraClip[®] has become a well-established method. It emulates the surgical technique of the Alfieri-stitch² and has proven to be beneficial in primary and secondary MR. A different method for interventional treatment of MR is the Cardioband[®] system, which adapts the surgical technique of annuloplasty.³

In the only published prospective study on Cardioband[®], only patients with secondary MR (where valve leaflets fail to adapt) were included, while primary MR with degenerative changes of the valve apparatus (such as prolapse or flail leaflet) was an exclusion criterion.¹ In this pivotal trial, Cardioband[®] annuloplasty effectively reduced MR, which was associated with improvement in heart failure symptoms and a favourable safety profile.⁴ To the best of our knowledge, this case is the first to show that a 'C-type angioplasty' using the Cardioband[®] device may also be a feasible option for primary MR.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Acknowledgements

We thank Dr N. Wunderlich for critical revision of our manuscript.

Slide sets: A fully edited slide set detailing this case and suitable for local presentation is available online as [Supplementary data](#).

Consent: The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: none declared.

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Handling Editor: Georg Golasch

Peer-reviewers: Marco De Carlo and Julia Grapsa

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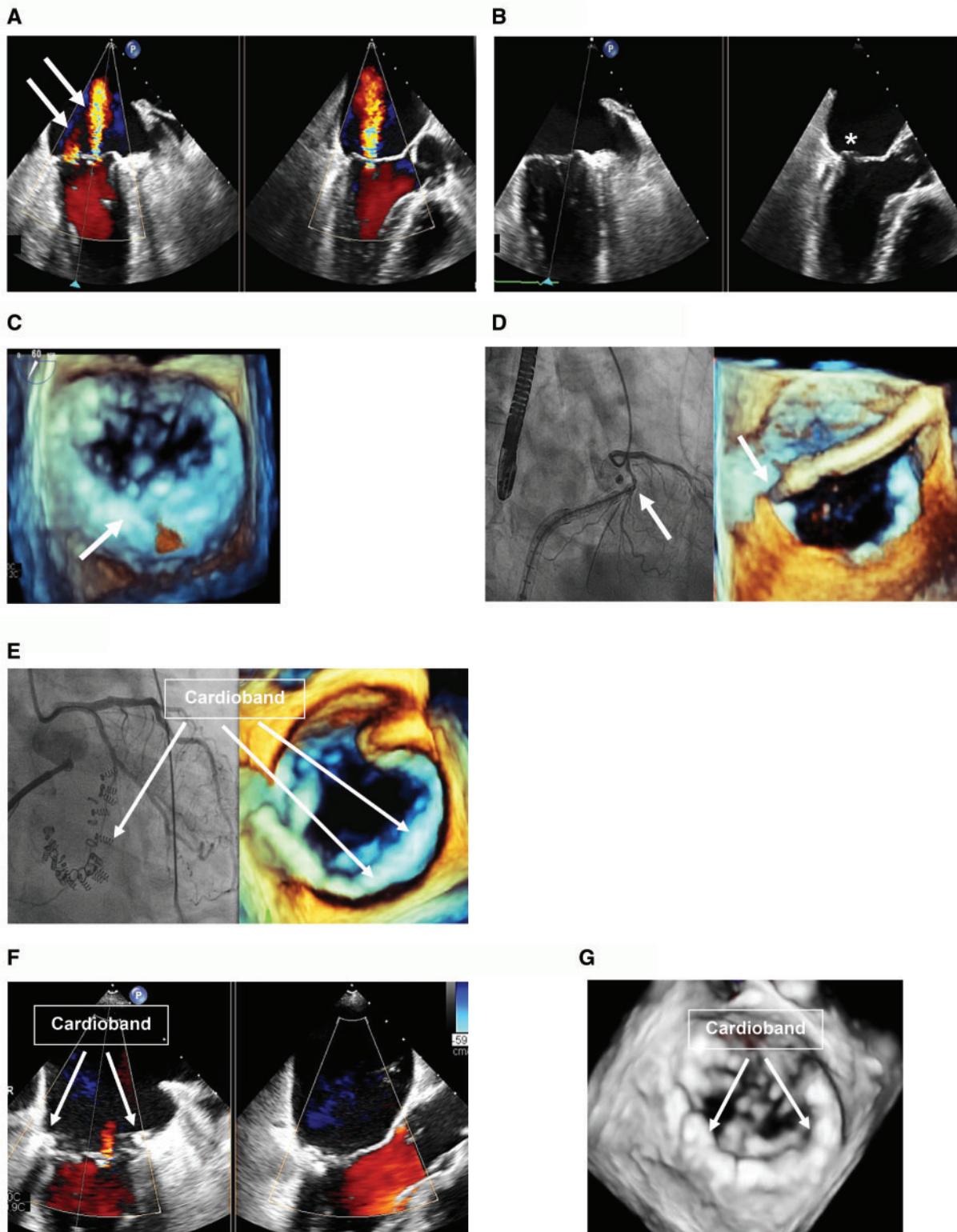


Figure 1 (A and B) Mitral regurgitation pre-intervention caused by a prolapse (indicated by *) of the P1 and the P2 segment of the posterior mitral valve leaflet resulting in two significant regurgitation jets (arrow). (C) Calcification of the posterior mitral annulus in P2 segment indicated by the white arrow. (D) Fluoroscopy and three-dimensional transoesophageal echocardiography: first anchor (white arrow) is placed close to the leaflet hinge (anterior) at the anterior commissure. (E) The Cardioband[®] device in a C-shaped form around the annulus along the posterior mitral valve leaflet (~10 cm length) under three-dimensional echocardiography and fluoroscopy. No significant left circumflex coronary artery impairment was observed. (F and G) A significant reduction of mitral regurgitation was achieved after implantation of the Cardioband[®] device.

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