

Title: Paravalvular leak after transcatheter valve implantation in mitral annular calcification: First report of a percutaneous closure with Amplatzer Vascular Plugs-III occluders.

Authors: Guillaume Leurent, M.D; Elena Galli, M.D; Hervé Le Breton, M.D; Vincent Auffret, M.D

DOI: 10.4244/EIJ-D-19-00744

Citation: Leurent G, Galli E, Le Breton H, V Auffret. Paravalvular leak after transcatheter valve implantation in mitral annular calcification: First report of a percutaneous closure with Amplatzer Vascular Plugs-III occluders. *EuroIntervention* 2020; Jaa-710 2020, doi: 10.4244/EIJ-D-19-00744

Manuscript submission date: 13 August 2019

Revisions received: 24 October 2019, 12 December 2019

Accepted date: 07 January 2020

Online publication date: 07 January 2020

Disclaimer: This is a PDF file of a "Just accepted article". This PDF has been published online early without copy editing/typesetting as a service to the Journal's readership (having early access to this data). Copy editing/typesetting will commence shortly. Unforeseen errors may arise during the proofing process and as such Europa Digital & Publishing exercise their legal rights concerning these potential circumstances.

Title: Paravalvular leak after transcatheter valve implantation in mitral annular calcification: First report of a percutaneous closure with Amplatz Vascular Plugs-III occluders.

Running title: AVP-III in paravalvular leak after transcatheter valve implantation in MAC.

Authors: Guillaume Leurent^{1* MD}; Elena Galli^{1 MD}; Hervé Le Breton^{1 MD}; Vincent Auffret^{1 MD};

Authors affiliations :

- 1- Univ Rennes 1, Department of Cardiology, CHU Rennes, Inserm, LTSI - UMR 1099, F-35000 Rennes, France

* **Corresponding author :** Dr Guillaume LEURENT, Service de cardiologie, CHU de Rennes, 2 rue Henri Le Guilloux 35033 RENNES Cedex, France

guillaume.leurent@chu-rennes.fr

Full disclosure of any potential conflict of interest: GL received fees as speaker/consultant from: Abbott, Abiomed, Astra Zeneca and Novartis.

Other authors have no conflict of interest.

Classifications: Mitral Regurgitation; Paravalvular leak, Transseptal

A single-stage transapical aortic then mitral valves implantation was performed in a 68 years-old man. Regarding the mitral valve, an Edwards Sapien3 29 mm bioprosthesis (Edwards Lifesciences, Irvine, CA) was implanted in severe mitral annular calcifications (MAC). Despite an initial success, the patient suffered a pulmonary edema 1 month after the initial procedure. Echographic and computed tomography analyses revealed a well-functioning aortic prosthesis and a delayed migration of the mitral prosthesis towards the left atrium, resulting in a severe paravalvular leak (PVL) (figures 1 A and 1B, motion 1). This PVL was located in the antero-lateral part of the mitral valve, with an arch-shaped aspect, measured at 8x16 mm.

A percutaneous (transfemoral transeptal antegrade approach) closure of this PVL was therefore performed under transesophageal guidance. The simultaneous positioning of 2 Amplatzer Vascular Plug (AVP)-III occluders (5x14 mm) (figures 1C and 1D) allowed an important reduction of the PVL (figure 1E, motion 2), without any migration of the mitral prosthesis or left ventricular outflow tract (LVOT) obstruction. At 1-month follow-up, patient was asymptomatic, with a mild residual PVL, and no significant hemolysis. However, at 2-month follow-up, clinical status suddenly worsened, due to a new prosthesis migration: index PVL correction was still fine, but new ones appears. A new 29 Sapien3 prosthesis was therefore surgically implanted, with a good result.

Balloon expandable transcatheter mitral valve implantations in MAC procedures are increasingly performed. Delayed migration of the prosthesis and PVL are well-known complications of those procedures¹. However, percutaneous closure of such PVL can be challenging². We strongly believe that, because of its oval shape, the AVP-III is well suited for such arch-shaped PVL: positioned in its short axis, it allows a limited protrusion in the LVOT reducing the risk of obstruction. However, a comprehensive assessment of the underlying mechanism of the PVL remains the cornerstone of any adapted treatment: percutaneous PVL closure should not be performed in case of leak due to valve migration given the risk of further valve embolization.

Legend:

Panel A and motion 1-Transesophageal echo (TOE) image showing the initial severe paravalvular leak

Panel B- CT image demonstrating an important antero-lateral arch-shaped gap between the annular calcification and the bioprosthesis (indicated by the asterisk).

Panel C- the simultaneous positioning of 2 Amplatzer Vascular Plug III occluders (5x14 mm) allows an obstruction of the defect between the mitral prosthesis and the calcified mitral annulus (panel D, occluders are indicated by arrows) along with an important reduction of the regurgitation (panel E and motion 2).

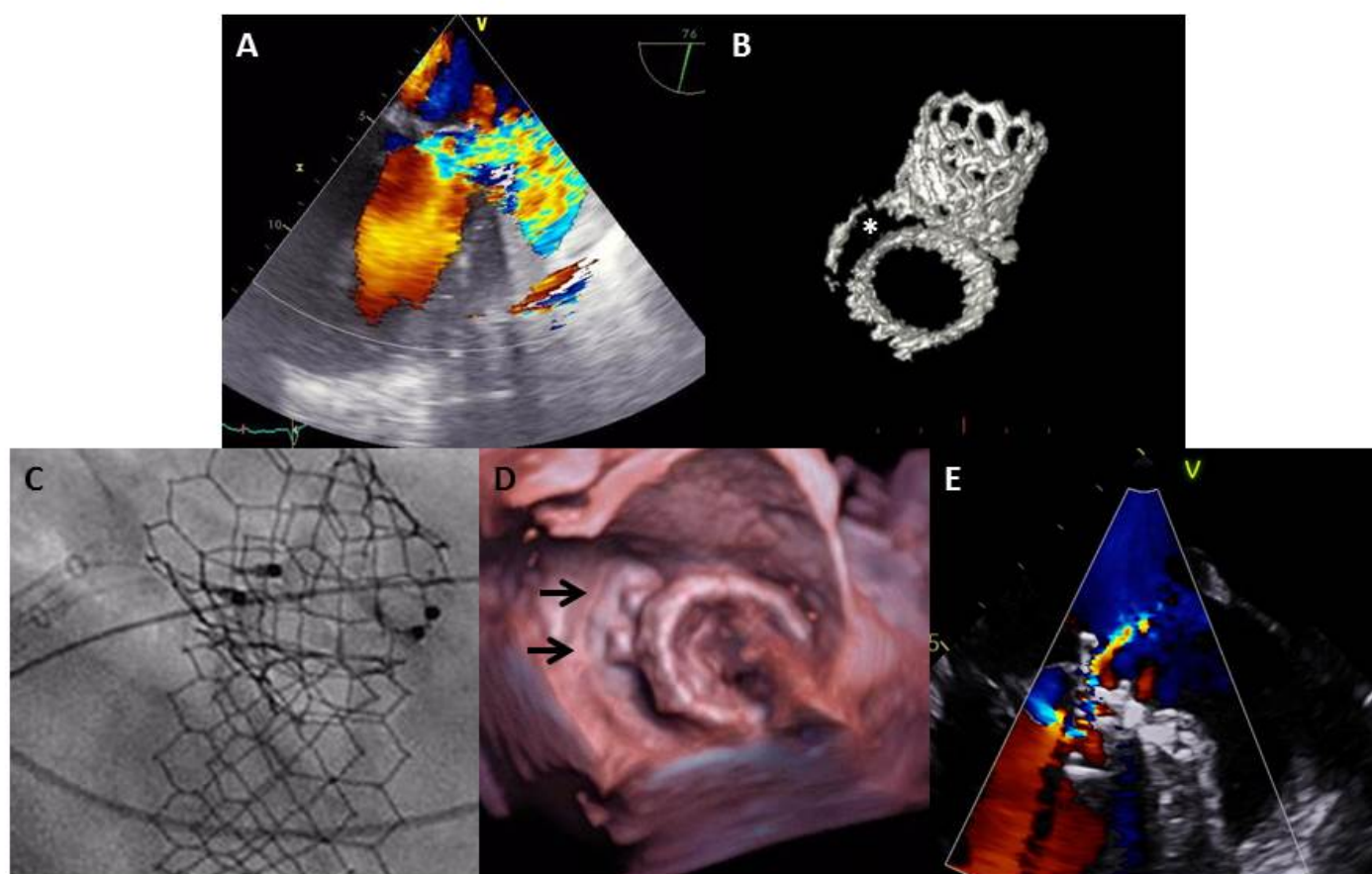
References

1. Yoon SH, Whisenant BK, Bleiziffer S, Delgado V, Dhoble A, Schofer N, Eschenbach L, Bansal E, Murdoch DJ, Ancona M, Schmidt T, Yzeiraj E, Vincent F, Niikura H, Kim WK, Asami M, Unbehaun A, Hirji S, Fujita B, Silaschi M, Tang GHL, Kuwata S, Wong SC, Frangieh AH, Barker CM, Davies JE, Lauten A, Deuschl F, Nombela-Franco L, Rampat R, Nicz PFG, Masson JB, Wijeyesundera HC, Sievert H, Blackman DJ, Gutierrez-Ibanez E, Sugiyama D, Chakravarty T, Hildick-Smith D, de Brito FS Jr, Jensen C, Jung C, Smalling RW, Arnold M, Redwood S, Kasel AM, Maisano F, Treede H, Ensminger SM, Kar S, Kaneko T, Pilgrim T, Sorajja P, Van Belle E, Prendergast BD, Bapat V, Modine T, Schofer J, Frerker C, Kempfert J, Attizzani GF, Latib A, Schaefer U, Webb JG, Bax JJ, Makkar RR. Outcomes of transcatheter mitral valve

replacement for degenerated bioprostheses, failed annuloplasty rings, and mitral annular calcification. Eur Heart J. 2019;40:441-51.

2. Al Hijji MA, El Sabbagh AE, Guerrero ME, Rihal CS, Eleid MF Paravalvular leak repair after balloon-expandable transcatheter mitral valve implantation in mitral annular calcification: Early experience and lessons learned. Catheter Cardiovasc Interv. 2019; 94:764-72.

Copyright EuroIntervention



Copy