

Title: The Retro-antegrade Approach to Paravalvular Leak Closure After Transcatheter Aortic Valve Replacement.

Authors: Chak-yu So, MBChB; Guson Kang, M.D; James C. Lee, M.D; Marvin H. Eng, M.D

DOI: 10.4244/EIJ-D-19-01122

Citation: So CY, Kang, G Lee JC, Eng MH. The Retro-antegrade Approach to Paravalvular Leak Closure After Transcatheter Aortic Valve Replacement. *EuroIntervention* 2020; Jaa-749 2020, doi: 10.4244/10.4244/EIJ-D-19-01122

Manuscript submission date: 17 December 2019

Revisions received: 24 February 2020

Accepted date: 13 March 2020

Online publication date: 17 March 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.

The Retro-antegrade Approach to Paravalvular Leak Closure After Transcatheter Aortic Valve Replacement

Short Title: Retro-antegrade Approach to Close Post-TAVR PVL

Chak-yu So, MBChB; Guson Kang, MD; James C. Lee, MD; Marvin H. Eng, MD

Henry Ford Hospital, Detroit, Michigan

Funding: None

Disclosures: Dr. Eng is a proctor for Edwards Lifesciences. All other authors report no conflict of interest.

Address for correspondence: Chak-Yu SO, Center for Structural Heart Disease, Henry Ford Hospital, 2799 West Grand Boulevard, Detroit, Michigan 48202. E-mail: kentso987@gmail.com

Keywords: Aortic stenosis; Paravalvular leak; TAVI

Paravalvular leak (PVL) post-transcatheter aortic valve replacement (TAVR) is challenging to close due to presence of transcatheter valve frame and calcium along the leak. We adopted the “retro-antegrade” approach to facilitate catheter and device delivery in closing 3 SAPIEN-3 (Edwards Lifesciences) PVL 3, 5 and 1-month post-TAVR respectively due to bulky left ventricular outflow tract (LVOT) calcium. Single arterial access for a 14Fr DrySeal sheath (Gore) were used in all patients.

In patient A, the PVL was crossed retrograde with a 400cm 0.035” stiff-angled Glidewire within a 6Fr EBU3.75 guide-catheter (Medtronic). Due to difficulty in catheter delivery, an arterial-arterial (A-A) rail was created by snaring the Glidewire in the LVOT into a JL4 guide-catheter through the center of the valve and externalized (**Figure A1**). A 6Fr TorqVue sheath (Abbott Vascular) crossed the leak with the A-A rail support, and an 8mm Amplatzer muscular VSD occluder (Abbott Vascular, mVSD-8) was deployed improving the PVL to moderate (**Figure A2-3**). Finally, the valve was post-dilated with a 26mm TRUE balloon (BARD), eliminating the residual PVL by conforming the occluder device to the leak (**Figure A4, Video 1-2**).

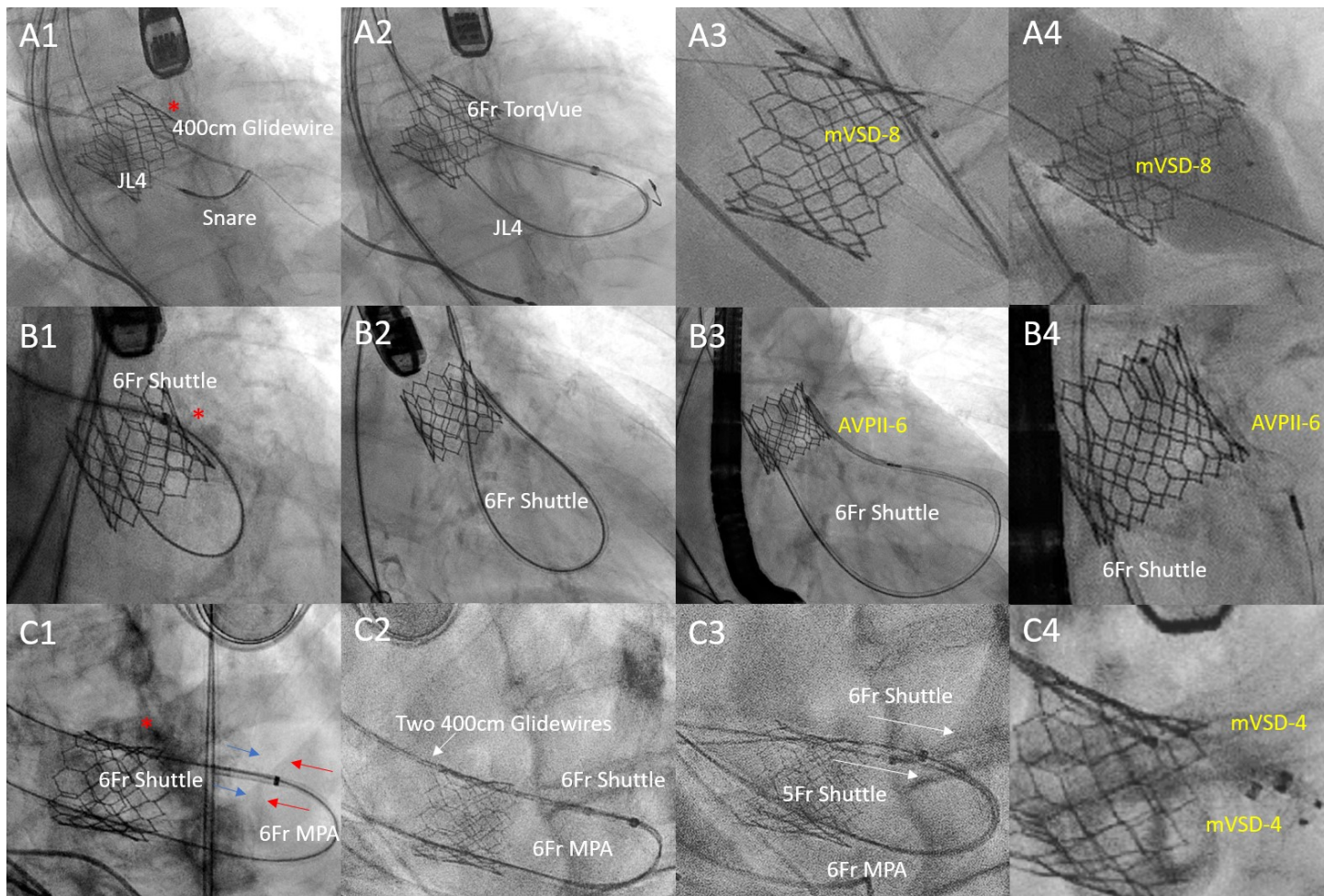
In patient B, multiple catheters failed to cross retrograde despite A-A rail support as above (**Figure B1**); therefore, a 5Fr Shuttle sheath (Cook Medical) was advanced over the externalized wire retrograde through the valve centrally and antegrade through the leak (**Figure B2**). A 6mm Amplatzer Vascular Plug II (AVPII-6) was deployed,

reducing the PVL to trivial (**Figure B2-3, Video 3-4**).

In patient C, two devices were planned due to crescentic-shaped PVL. After A-A rail formation as above, a 6Fr Shuttle sheath was advanced across the defect and a 6Fr MPA guide-catheter was advanced centrally through the valve and telescoped into the sheath (**Figure C1**). Then, another 400cm 0.035” Glidewire was sent through the catheters to establish two A-A rails (**Figure C2**). Afterwards, a 6Fr and a 5Fr shuttle sheath were delivered retrogradely through the PVL with rails support, to facilitate subsequent simultaneous implantation of two 4mm Amplatzer muscular VSD occluders (mVSD-4), reducing PVL to mild (**Figure C3-4, Video 5-6**).

The illustrated “retro-antegrade” approach can facilitate catheter delivery across post-TAVR PVL and hence expand occluder device choices and optimize occlusion result. Balanced push-and-pull force is needed while manipulating the A-A rail to avoid the risk of valve embolization.

Figure. Fluoroscopic images illustrating 3 “retro-antegrade” approach to close post TAVR PVL (*=calcium).



Disclaimer : As a public service to our readership, this article -- peer reviewed by the Editors of EuroIntervention - has been published immediately upon acceptance as it was received. The content of this article is the sole responsibility of the authors, and not that of the journal

Supplementary data:

Video Legends:

Supplementary Movie 1, 3, 5 baseline and Post PVL Closure

Supplementary Movie 2, 4, 6 transesophageal echocardiogram for the 3 patients.

Copyright EuroIntervention