

Title: Transcatheter Aortic Valve Implantation in Unicuspid Aortic Valve Stenosis.

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DOI: 10.4244/EIJ-D-20-00076

Citation: Chopra A, Uthayakumaran K, Rao RS, Mullasari AS. Transcatheter Aortic Valve Implantation in Unicuspid Aortic Valve Stenosis. *EuroIntervention* 2020; Jaa-726 2020, doi: 10.4244/EIJ-D-20-00076

Manuscript submission date: 14 January 2020

Revisions received: 28 January 2020

Accepted date: 06 February 2020

Online publication date: 11 February 2020

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Transcatheter Aortic Valve Implantation in Unicuspid Aortic Valve Stenosis

Short Title: TAVI in Unicuspid AS

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Key words : TAVI, Aortic stenosis, MSCT, Transthoracic echocardiogram

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A 55-year-old male presented with acute left ventricular failure. His transthoracic echocardiogram (TTE) showed calcific unicuspid, unicommissural aortic valve with severe stenosis and moderate regurgitation, severe biventricular dysfunction and dilated ascending aorta (Figure 1). After medical stabilization, he was advised surgical aortic valve and aortic root replacement. He was refused surgery in view of severe biventricular dysfunction. He underwent successful Transcatheter Aortic valve implantation (TAVI) with a 29 mm Corevalve Evolut R (Medtronic, Minneapolis). His post procedure period was uneventful.

Unicuspid Aortic valve is a rare anomaly and the unicommissural variant presents with aortic stenosis in the adulthood. Similar to bicuspid aortic valve, it is associated with severe valve calcification, eccentric opening and aortopathy. Surgical aortic valve replacement along with aortic root replacement remains the appropriate treatment for these patients¹. However, TAVI may be considered in patients with high surgical risk and suitable anatomy. Presence of aortopathy, horizontal aortic root, and eccentric valve opening makes valve crossing and device delivery challenging. In addition, unicommissural anatomy may result in noncircular expansion of the stent frame at the level of the annulus. Hence, a self-expanding supra-annular valve may offer better hemodynamic performance.

Figure and Legends

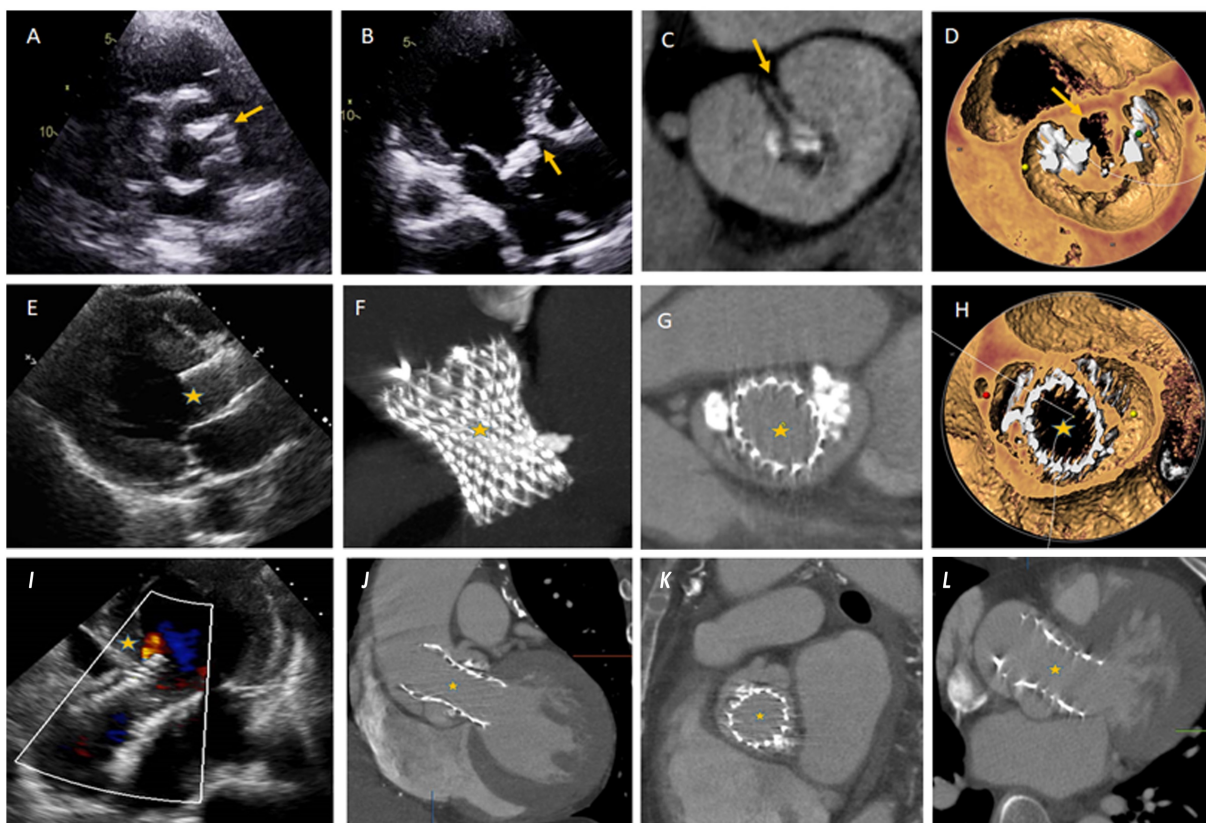
Figure 1: Transthoracic echocardiogram parasternal short axis (A, Video 1) and three chamber views (B, Video 2) showing calcific unicuspid, unicommissural aortic valve with eccentric opening (Arrow). Computed Tomography maximum intensity projection (MIP, C) and volume rendered (VR, D) images showing unicuspid unicommissural valve and absence of raphae. Post TAVI, TTE parasternal long axis images showing prosthetic valve in situ (E). High resolution CT MIP and VR images showing oval configuration and good expansion of the prosthetic valve (F – H, star, Video 3). Post TAVI, TTE Five chambered image showing prosthetic valve in situ and showing mild paravalvular leak (I, star, Video 4). CT image- Coronal, Sagittal and Axial view showing prosthetic valve in situ (J – L, star).

Reference :

1. Armstrong J, Crawford J, Arnautovic J. Unicuspid aortic valve replacement with development of complete heart block: a case report. Eur Heart J Case Rep. 2019;3(1):ytz026. doi: 10.1093/ehjcr/ytz026. eCollection 2019 Mar.

Conflict of interest statement :

The authors have no conflicts of interest to declare.



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Supplementary Video Legends

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Video 1 – Parasternal short axis view of native valve.

Video 2 –Three chamber view showing of native valve.

Video 3 – Post TAVI CT of prosthetic valve.

Video 4 –Five chamber image of prosthetic valve.

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