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Balloon-Assisted BASILICA to Facilitate Redo-TAVR

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BASILICA can prevent coronary obstruction following TAVR.[1] TAV-in-TAV may pose the highest risk for obstruction, because of narrow residual sinuses, tall leaflets, and supra-annular designs. Bench testing suggests that certain TAV devices exhibit inadequate leaflet "splay" following traditional BASILICA.[2] In cases risking inadequate splay (heavily calcified leaflets, very small valve-to-coronary distance, TAV-in-TAV), we have performed balloon-assisted (BA)-BASILICA. This expands the traversal point outward by inflating a balloon across the leaflet(s) prior to laceration and increases leaflet splay (Figure 1A). Herein, we describe the first reported case.

An 80-year-old of prohibitive surgical risk (STS-PROM: 15.8%) suffered structural deterioration of a 29 mm CoreValve (Medtronic). Computed tomography revealed heavily calcified leaflets extending above both coronary ostia, which would seal at the sinotubular junction (Figure 1B). The procedure was performed under general anesthesia with cerebral

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Disclosures:

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protection. In standard fashion, the right and left coronary cusp leaflets were traversed with 0.014" guidewires and ensnared in the left ventricular outflow tract (Figure 1C).[3] The right and left leaflet traversal points were then dilatated using 5mm noncompliant balloons (Figure 1D and E). Both leaflets were then lacerated in standard fashion. Leaflet dilation added approximately 15 minutes to the procedure. Neither balloon dilatation nor leaflet laceration changed hemodynamics. Coronary inflow was preserved following implantation of a 26 mm TAV (SAPIEN 3, Edwards) (Figures 1F and G). The cerebral embolic filter captured significant debris. The patient was discharged post-procedure day 5.

BA-BASILICA may be a viable treatment strategy for patients previously thought ineligible for traditional BASILICA. This and other leaflet modification strategies may allow safer TAV-in-TAV for carefully selected patients with threatened coronary obstruction.

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ABBREVIATIONS AND ACRONYMS

BASILICA	Bioprosthetic aortic scallop intentional laceration to prevent iatrogenic coronary artery obstruction
TAV	Transcatheter aortic valve
TAVR	Transcatheter aortic valve replacement

REFERENCES

1. Khan JM, et al. Transcatheter Laceration of Aortic Leaflets to Prevent Coronary Obstruction During Transcatheter Aortic Valve Replacement. JACC Cardiovasc Interv. 2018;11(7):677–689. [PubMed: 29622147]
2. Khan JM, et al. TAVR Roulette: Caution Regarding BASILICA Laceration for TAVR-in-TAVR. JACC Cardiovasc Interv. 2020;13(6):787–789. [PubMed: 32192701]
3. Lederman RJ, et al. Preventing Coronary Obstruction During Transcatheter Aortic Valve Replacement. JACC Cardiovasc Interv. 2019;12(13):1197–1216. [PubMed: 31272666]

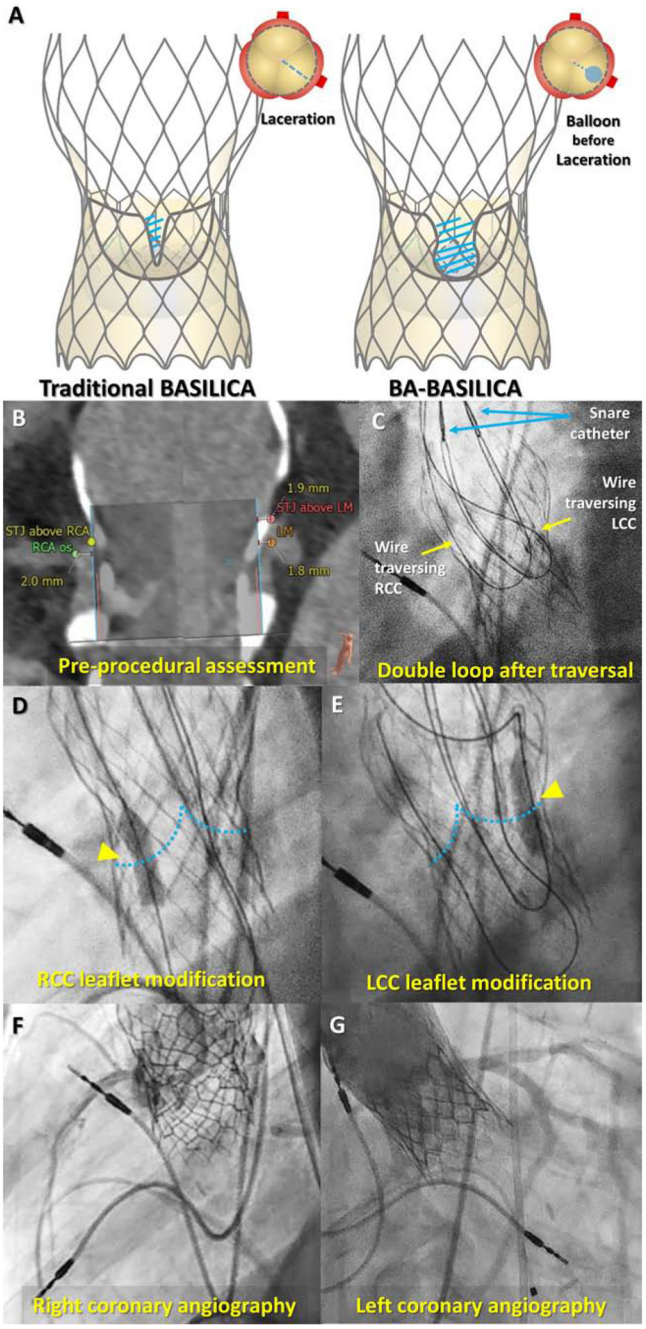

Figure.

(A) Concept of balloon-assisted BASILICA; traditional BASILICA (left panel) may not achieve adequate splay due to restriction from the outer frame of a TAV and balloon-assisted BASILICA (right panel) may facilitate a larger splay. (B) Pre-procedural analysis showing threatened coronary arteries. (C) Two wire loops after traversal of both right and left coronary cusp leaflets. (D and E) Right and left leaflet modification with a 5mm balloon prior to laceration. (F and G) Coronary angiography after TAV-in-TAV with no coronary flow limitation.