

## Presence of an anomalous coronary artery: A potential risk factor for device-related late coronary ischemic syndromes following transcatheter aortic valve implantation?

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Acute coronary complications including coronary ostial occlusion have been occasionally encountered in patients undergoing transcatheter aortic valve implantation (TAVI) with a particular predilection for those with high-risk features such as the presence of coronary arteries with a low take-off pattern and heavy valvular calcifications [1, 2]. The recent clinical vignette by Diećkus et al. suggests that the presence of an anomalous coronary artery is also a risk factor for TAVI-related acute coronary occlusion [1]. I strongly agree with the management strategy of that challenging case, particularly with regard to selection of a TAVI device with low radial expansion force to prevent compression on the anomalous circumflex artery [1]. However, I would like to highlight further implications of dealing with an anomalous coronary artery (including emergence of device-related late coronary ischemic syndromes) in patients undergoing TAVI.

In the clinical setting, TAVI-related "late coronary ischemic syndrome" signifies late-onset stable or unstable coronary syndrome primarily associated with device implantation and terminologically excludes procedure-related acute coronary complications [2, 3]. Importantly, this phenomenon might account for a significant portion of readmissions due to chest pain following TAVI [2, 3]. Mechanistically, it might be attributable to certain device-related pathologies such as coronary embolism, disturbed coronary flow pattern (with or without in-situ thrombogenesis), microvascular dysfunction, etc. [2]. Regarding its evolution, our group previously suggested a variety of patient and procedure-related risk factors including use of self-expandable

valves, valve-in-valve procedures, pre-existing hypercoagulable conditions, premature cessation of antiplatelet/anticoagulant medications, severe left ventricular hypertrophy, etc. [2].

In this context, I hold the opinion that an anomalous coronary artery might also serve as a risk factor for TAVI-related late coronary ischemic syndromes. It was previously suggested that acute coronary complications associated with anomalous coronary arteries might also arise in the post-intervention period following an apparently uneventful TAVI procedure, and hence; might rarely emerge as a delayed phenomenon [4]. However, this might also be regarded as a peri-procedural [4], and not a truly late complication. By definition, late coronary ischemic syndromes in this context should arise after a substantial duration, and usually after hospital discharge [2]. In particular, anomalous coronary arteries might be particularly affected by the device-related morphological changes in the aortic root (including aortic root elongation, dilatation, and changes in the aortic angle). In other words, aortic root changes due to device implantation might potentially lead to a variety of adverse configurational and rheological alterations in the anomalous coronary artery (including emergence or further narrowing of a slit-like coronary ostium, coronary kinking without overt stenosis leading to reduced coronary perfusion and disturbances in laminar flow, etc.). However, these subtle alterations involving the anomalous coronary artery might be potentially missed or masked on post-TAVI coronary angiogram and might lead to coronary ischemic syndromes in the long term (2). Therefore, the

patient [1] should be further investigated with advanced modalities (computed tomography, myocardial perfusion scintigraphy, etc.) for potential changes in the anomalous circumflex artery (ostial configurational alterations, coronary flow velocity) and possible ischemic findings in the circumflex territory following the TAVI procedure. Notably, anticoagulation therapy may be preferred over antiplatelet agents in certain patients undergoing TAVI who are considered to have a high risk for late coronary ischemic syndromes, particularly through mechanisms including in-situ thrombus formation due to disturbed coronary flow kinetics [2]. Therefore, I wonder about the authors' choices of long-term anti-ischemic and blood thinning regimens for their patient.

In conclusion, the authors [1] should be highly commended for this didactic case management. However, TAVI candidates with an anomalous coronary artery might not only suffer from procedural coronary complications [1] but might also have a significant predisposition to device-related late coronary ischemic syndromes [2,3]. Therefore, these patients need to be further investigated for potential changes in the anomalous coronary artery (along with signs of myocardial ischemia) even after an uneventful TAVI procedure. In general, timely diagnosis and management of device-related late coronary ischemic syndromes might significantly improve the prognosis in the post-TAVI setting [2].

## Article information

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