Percutaneous aortic valve implantation in severe stenosis associated with anomalous origin of the circumflex coronary artery

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We report a case of an 84-year-old man with anomalous origin of the circumflex coronary artery (AOCCA) from the right coronary artery (RCA) and symptomatic (NYHA III) severe aortic stenosis treated with a transfemoral aortic valve implantation (TAVI) for his high surgical risk and frailty (EuroScore 11%).

A routine pre-implantation cardiac catheterization and angiography showed a single-vessel disease: chronic total occlusion of RCA with collateral flow and AOCCA from the proximal RCA. The multidetector computed tomography (MDCT) verified the AOCCA from the RCA with retroaortic course and showed aortic annulus sizing 22 × 27 mm (Panels A and B).

Transfemoral aortic valve implantation was performed by a femoral approach. During a pre-dilatation with a 22 mm balloon, an aortic angiography showed filling of the left coronary but not of the circumflex (CX) (Panel C). To avoid possible compression of CX by a balloon expandable valve, we implanted a 26 mm CoreValve®. Angiography after deployment showed a normal coronary flow with mild regurgitation (Panel D). The post-procedural MDCT showed a good stent expansion without stretching the aortic annulus and coronary lumen (arrow in Panel E).

The in-hospital course was uneventful and the patient was discharged on Day 4 after the procedure. At 3-month follow-up, the patient remained free of adverse events in NYHA I.

This case showed the feasibility of TAVI in AOCCA, even if the coronary artery runs close to the aortic annulus. Self-expandable valve may be preferable because of reduced wall tension and stretching on the annulus.