

Transcatheter aortic valve implantation in bicuspid aortic valve stenosis: caveats and single center experience

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Introduction: Bicuspid aortic valve stenosis (AS) differs from degenerative tricuspid AS. Patients with bicuspid AS are younger, with more unfavorable anatomical characteristics (calcium distribution, ascending aorta dilatation, annular diameter, and aorta horizontality) and thus less favorable for transcatheter aortic valve implantation (TAVI).¹ We present single center experiences with TAVI in bicuspid AS.

Patients and Methods: Patients who underwent TAVI procedures in our center between September 2019 and June 2024 were included in the analysis.

Results: Out of 467 patients there were 26 (5.5%) patients with true bicuspid AS verified by specific multi-slice computed tomography (MSCT) analysis. In comparison to other patients in the TAVI registry, patients with bicuspid AS who received TAVI were younger (77 vs 80 years), received more frequently balloon expandable systems (93% vs 67%) with larger device diameters (27.5 vs 26 mm). They also had horizontal aorta more frequently in comparison to other patients. In regard to intervention strategy, all patients with bicuspid AS had balloon predilatation before implantation. There were no differences in cardiovascular mortality within 30 days. Proportion of moderate or severe paravalvular leak (PVL) and permanent pacemaker implantation (PPM) after TAVI was higher in patients with bicuspid AS in comparison to other patients (11.5% vs 10% for PPM, and 15% vs 12% for PVL) but those differences were not significant.

Conclusion: Patients with bicuspid AS in our TAVI cohort were less represented than in other comparable registries where they represent 10-15% of all TAVI patients, most probably because of the use of only true bicuspid definition regarding MSCT analysis and lower proportion of low-risk patients who more frequently present with bicuspid AS in our registry. They have more unfavorable anatomical characteristics, but with careful device selection and sizing, and proper implantation protocols they can achieve comparable results to patients with tricuspid aortic valves.

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