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76 YEARS OLD, BICUSPID AORTIC VALVE STENOSIS AND SINGLE VESSEL CORONARY ARTERY DISEASE: IF TAVI, HOW?

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Rational: Aortic valve stenosis in bicuspid anatomies is technically more challenging to treat percutaneously than in tricuspid cases and has slightly higher procedural risks, moreover long-term data on this patient population is scarce. Surgery on the other hand has low procedural risks and good long-term data which makes it preferred in younger patients, especially if concomitant coronary artery disease is found. Heart Team careful evaluation of clinical and technical aspects of each case is always mandatory to achieve the best possible treatment. We present a case of severe bicuspid aortic valve stenosis and single vessel coronary artery disease treated with transcatheter aortic valve replacement and coronary angioplasty.

Technical resolution: In patients with bicuspid anatomy the pre-procedural planning and analysis of the CT scan is extremely important and the aortic bioprosthesis landing zone must be carefully evaluated in order to minimize procedural risks. In this case the intercommissural distance measured at the annular plane and at 4 and 8 mm above the annulus was the same at all three levels which accounted for “straight tube” configuration of the valve landing zone. As commonly happens in such anatomies, coronary ostia were high above coronary annulus and the Valsalva sinuses were large. We decided to perform in a single procedure, with cerebral protection, the TAVI first implanting a BSCI accurateNEO2 valve size L and trying to achieve coronary alignment. TAVI was then followed by LAD angioplasty. After implant the valve had no paravalvular regurgitation but it had a slight elliptical shape, however no significant invasive gradient was measured (peak-to-peak < 10 mmHg) thus no postdilatation was performed. The patient was safely discharged home after 4 days, trans-prosthetic mean gradient at discharge was 12 mmHg.

Clinical implications: Many clinical and procedural aspects must be considered when dealing with percutaneous treatment of bicuspid aortic valve stenosis:

- surgical aortic valve replacement has good long-term data in this population so surgery must be considered in patients fit for it;
- to safely perform TAVI, aortic root and valve landing zone anatomy must be carefully studied with special attention to landing zone conformation, raphe and leaflet calcifications, coronary ostia location and ascending aorta morphology;
- native aortic valve pre-dilatation and TAVI post-dilatation must be considered in order to achieve the best result possible in terms of paravalvular leaks, transvalvular gradient and valve durability;
- because bicuspid aortic valve TAVI have a higher risk of stroke, cerebral protection must be considered in all cases.

Perspectives: Although no randomized controlled trials have compared surgical and percutaneous interventions in this specific setting, observational studies have clarified that percutaneous treatment is feasible, safe and has similar one-year outcomes to surgical replacement and tricuspid aortic valve TAVR.



New generation heart valve prostheses together with meticulous implantation planning have even improved the outcomes of this procedure in terms of lesser paravalvular leaks and lower trans-prosthetic gradients. However new studies are needed to evaluate long-term outcomes and prosthetic durability as well as to refine the implantation planning and carrying out.