Bicuspid aortic valve stenosis with successful transfemoral transcatheter aortic valve replacement (TAVI) using the Sapien 3 valve

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An 80-year-old woman with coronary artery disease status post bypass surgery, pulmonary hypertension, and permanent atrial fibrillation presented with symptoms of dyspnoea (New York Heart Association class IV). She was found to have a severely stenotic bicuspid aortic valve (AV).

Coronal (Panel A), sagittal (Panel B), and transverse axis (Panel C, upper image) CT angiogram images reveal a mean annulus diameter of 28.0 mm. The patient had a type 0 bicuspid AV without a raphe (Panel C, lower image). The left (Panel A, lower image) and right (Panel B, lower image) coronary ostia were at acceptable distance from the aortic annulus. Aortic root angiogram (Panel D) shows the bicuspid AV anatomy and the plane of the two hinge points (dotted line). Alignment of the valve was done by bringing the 29 mm Sapien 3 (S3) prosthesis stent frame in a coaxial view (Panel E). Careful attention was given to position the valve skirt at the height of the two hinge points; contrast was administered during slow valve deployment. The prosthetic valve was confirmed to be in an excellent position with good function and no aortic regurgitation (Panel F). The post-procedure echocardiogram showed a successful reduction in the mean valve gradient from 40 to 9 mmHg.

Although TAVI of a bicuspid AV is a relative contraindication in the current ESC guidelines, cases of TAVI in a bicuspid AV have been reported. This is the first reported successful case of TAVI done with the third generation balloon-expandable Edwards S3 valve. When CT annulus measurement is questionable then balloon sizing during the procedure is recommended.

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