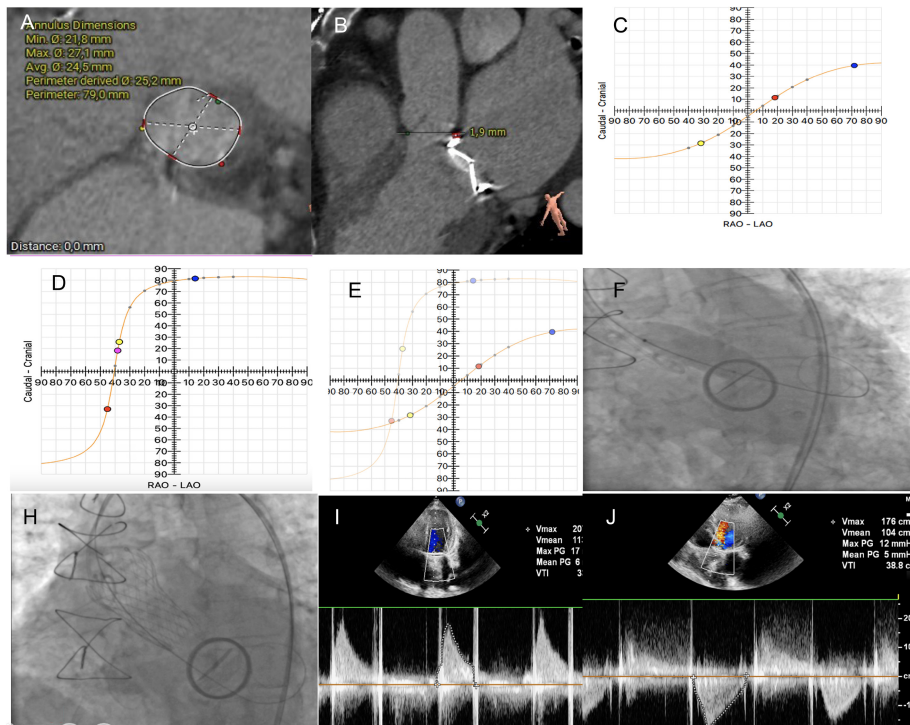


## Using Aortic and Mitral Annuluses S Curves to Transcatheter Aortic Valve Implantation in Patient with Mechanical Mitral Valve

A 71-year-old female patient was admitted with dyspnea and chest pain. Her medical history included hypertension, chronic obstructive pulmonary disease, mechanical mitral valve replacement, and tricuspid ring annuloplasty. Echocardiography revealed severe aortic stenosis (mean gradient: 44 mm Hg), mechanical mitral valve prosthesis with normal function (mean grad: 6 mm Hg), moderate tricuspid regurgitation, and ejection fraction was 45%. Because of high surgical risk, transcatheter aortic valve implantation (TAVI) was decided. Annulus perimeter was measured as 79 mm by pre-operative computed tomography (Figure 1A). The distance between aortic and mitral annuluses was measured as 1.9 mm using Trimensio software (Figure 1B). First, to determine cusp overlap implantation view, aortic valve S curve was calculated by ProSize AV software



**Figure 1. (A) Aortic annuluses perimeter was measured as 79 mm. (B) The distance between aortic and mitral annuluses was measured as 1.9 mm. (C) Aortic valve S curve. (D) Mitral valve S curve. (E) Aortic and mitral valve S curves were superimposed to decide the best implantation view. Due to these curves, right 45 caudal 40 degree was best projection. (F) Balloon predilatation in spider view. (G) In right 45 caudal 40 degree as a best protection; adequate distance between aortic and mitral prostheses was seen and there is no any interaction between them. (I and J) Post-TAVI echocardiographic examinations.**

### E-PAGE ORIGINAL IMAGE



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(Figure 1C). Second, to determine mitral annulus plane, mitral annulus S curve was calculated (Figure 1D). Finally, both of these curves were superimposed to specify best view angle between 2 annuluses (Figure 1E).

After informed consent was signed by the patient and her relatives, she was referred to TAVI. Balloon predilatation was done at the beginning of the procedure in the spider view to unveil interaction between aortic and mitral valves (Figure 1F and Video 1). Medtronic Evolute R valve of 29 mm was implanted by using the cusp overlap technique to minimize implantation depth. To determine the exact interaction and distance between aortic and mitral prosthesis right 45° caudal 40° angle was taken. In this view, adequate distance between 2 prostheses was seen, and there is no interaction between them (Figure 1H and Video 1). Post-procedural echocardiography showed normal mechanic mitral valve gradient (Figure 1I), and the mean aortic valve gradient was 5 mm Hg (Figure 1J and Video 1).

The evaluation of mitroaortic space and angle between mitral and aortic annuluses are recommend in this patient group.<sup>1</sup> The distance between mitral and aortic annuluses is the key element to decide TAVI suitability. Naturally, these 2 annuluses have distinct planes. To determine the correct distance between them, the coordinate of intersection between the plane of the 2 annuluses should be measured.

Double S curve measurement should be recommended during cusp overlap or valve in valve procedures;<sup>2</sup> to our best knowledge, this is the first usage in patient with mechanical mitral valve.

Although previous papers recommend not to implant Medtronic platforms if mitroaortic distance is less than 4 mm,<sup>1</sup> we could implant without any complication using double S curve calculation.

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**Informed Consent:** Written informed consent has been obtained from the patient.

**Declaration of Interests:** The authors have no conflict of interest to declare.

**Video 1:** TAVI procedure in patient with mechanic mitral valve prosthesis.

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