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CARDIOVASCULAR FLASHLIGHT

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Regurgitation after Edwards SAPIEN valve implantation: truly paravalvular or 'supra-skirtal'?

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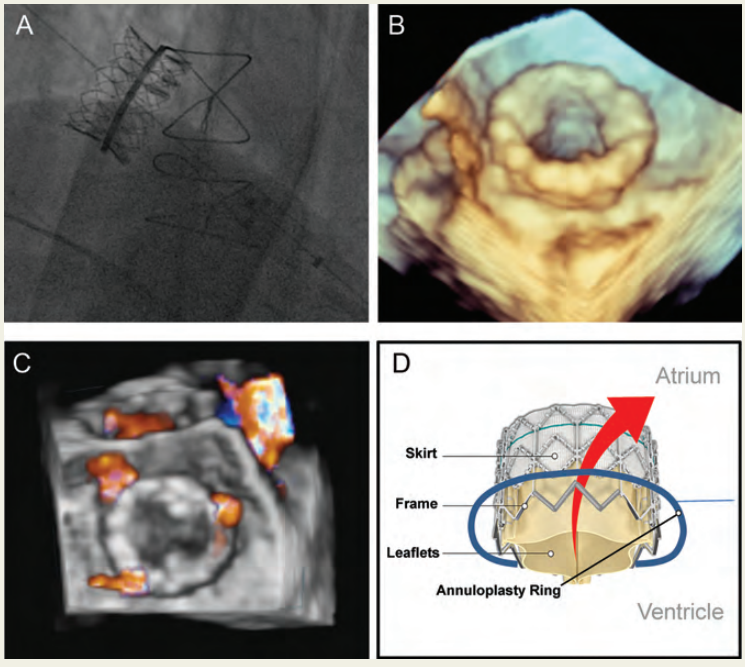

A 73-year-old male was referred with severe mitral regurgitation 9 years after mitral valve annuloplasty with a 32-mm Edwards Lifesciences ring. On the basis of an anticipated high perioperative risk related to chronic kidney disease and left ventricular systolic dysfunction, mitral valve-in-ring implantation using a 29-mm Edwards SAPIEN prosthesis was performed by transapical access (*Panel A*). Post-procedural three-dimensional transoesophageal echocardiography revealed three paravalvular regurgitation jets at the 3, 7, and the 11 o'clock positions (*Panels B* and *C*).

In this patient, we observed a third type of regurgitation in Edwards SAPIEN prostheses, which is caused by the device design. Edwards SAPIEN prostheses are built up by bovine pericardial tissue leaflets fixed on a stainless steel frame. A polyethylene terephthalate skirt partially covers the steel frame. However, since the skirt covers the basal two-thirds of the frame only, regurgitation through its uncovered part may occur (arrow, *Panel D*; adapted from www.edwards.com/products/transcathetervalve/Pages/sapienthv.aspx). This type of regurgitation was seen in the patient presented here, since the skirt is positioned in the left atrium rather than the annuloplasty ring. The commissures cover the whole length of the steel frame, and the regurgitation jets are therefore located in between the commissures and positioned ~120° apart from each other. In patients with Edwards SAPIEN prostheses in aortic position, the same phenomenon may be observed with prostheses implanted too apically. However, as the left ventricular outflow tract is narrow, regurgitation jets are more difficult to visualize.

Hence, after Edwards SAPIEN prosthesis implantation, regurgitation is transvalvular or paravalvular or 'supra-skirtal'. As the technology of transcatheter valves is still evolving, constant improvement in the device design and proper placement of the prosthesis are important.