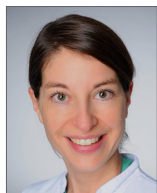


# Successful treatment of an iatrogenic membranous ventricular septal defect (IVSD) following Edwards SAPIEN 3 implantation by a valve-in-valve procedure



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Iatrogenic membranous ventricular septal defects (IVSD) are a rare complication of transcatheter aortic valve implantation (TAVI), mainly attributed to post-dilation and excessive calcification in the left ventricular outflow tract (LVOT). We report a case of IVSD following implantation of an Edwards SAPIEN 3 transcatheter heart valve (Edwards Lifesciences, Irvine, CA, USA) which was successfully treated by a valve-in-valve procedure.

A 79-year-old male with heavily calcified aortic valve and calcification in the LVOT underwent TAVI. Following predilatation, a 29 mm SAPIEN 3 prosthesis was deployed uneventfully. Over the next 12 hours the patient developed right ventricular failure. Echocardiography showed an IVSD with a haemodynamically relevant left-to-right shunt. CT revealed that the prosthesis lying at the upper rim of calcification spots in the LVOT had caused a tear along the calcification. Since the patient deteriorated over the following eight hours, a second 26 mm SAPIEN 3 prosthesis

was implanted uneventfully at a lower position within the LVOT to close the IVSD. Transoesophageal echocardiography (TEE) revealed a minimal residual IVSD, no paravalvular leak (PVL) and  $\Delta P_{\text{mean}} = 5$  mmHg. Due to postoperative 3<sup>rd</sup> degree atrioventricular (AV) block, a pacemaker was implanted. A transthoracic echocardiogram (TTE) after two months showed persistent minimal IVSD jet. Left and right ventricular function were preserved and the patient was asymptomatic.

## Conflict of interest statement

T. Rudolph, S. Baldus, T. Wahlers and N. Mader are proctors for Edwards Lifesciences. The other authors have no conflicts of interest to declare.

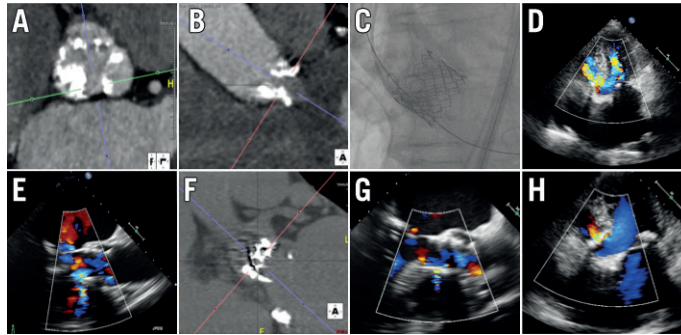
## Supplementary data

Online Figure 1. CT and echocardiographic images.

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## Supplementary data



**Online Figure 1.** CT and echocardiographic images. *A)* Preoperative CT scan revealed a symmetrically severely calcified aortic valve and two prominent spike-like calcifications in the LVOT (*B*). *C)* Final position of the SAPIEN 3 (29 mm). *D)* Postoperative TTE and TEE (*E*) showed an IVSD with significant left-to-right shunt. *F)* Prosthesis at the upper rim of LVOT calcification (CT scan). *G)* After implanting the second SAPIEN 3 (26 mm), intraoperative TEE revealed a minimal residual IVSD jet. *H)* Small jet from the left into the right ventricle at two-month follow-up.