

# PERCUTANEOUS TREATMENT OF SEVERE PARAVALVULAR REGURGITATION AFTER PORTICO TRANSCATHETER AORTIC VALVE IMPLANTATION

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## HISTORY AND PHYSICAL

An 82 year-old man was referred to our unit in III/IV NYHA heart failure situation and severe aortic stenosis with normal ejection fraction. Mild hypertensive cardiomyopathy and mono-vessel coronary artery disease were reported three years before. After Heart Team evaluation, we decided for transaortic valve implantation (TAVI) (EuroSCORE-Log 7,35%), considering the patient's preferences.

The procedure was performed under conscious sedation and angiographic guidance. After pre-dilatation of the native valve with 20-mm NuMED balloon, 25-mm self-expandable Portico™ (St. Jude Medical, Minneapolis, United States) was implanted via transfemoral. Moderate to severe paravalvular aortic regurgitation (PAR) was assessed by fluoroscopy (grade 3). 22-mm NuMED balloon post-dilatation decreased the regurgitation to moderate. Despite the improvement it remained significant (grade 2+) by angiographic assessment. We decided to stop the procedure in order to re-evaluate the need of elective reintervention.

## IMAGING

Two months later the patient was readmitted in advanced heart failure situation. Two-D and three-D-Transesophageal-Echocardiography (2D-3D TEE) evaluation confirmed the presence of severe posterior regurgitation (Figure 1) due to heavy calcium nodules that caused malapposition of the valve stent frame to the aortic annulus. We considered the possibility of valve under-expansion being responsible for the incomplete apposition; however, the presence of severe calcification, stent current size and the high pressure post-dilatation in the procedure made us set aside that idea. Quantified by Doppler-colour, the PAR represented a quarter of the ring circumference in the short-axis view and the jet extended beyond the left ventricular outflow tract (LVOT) in the long-axis view.

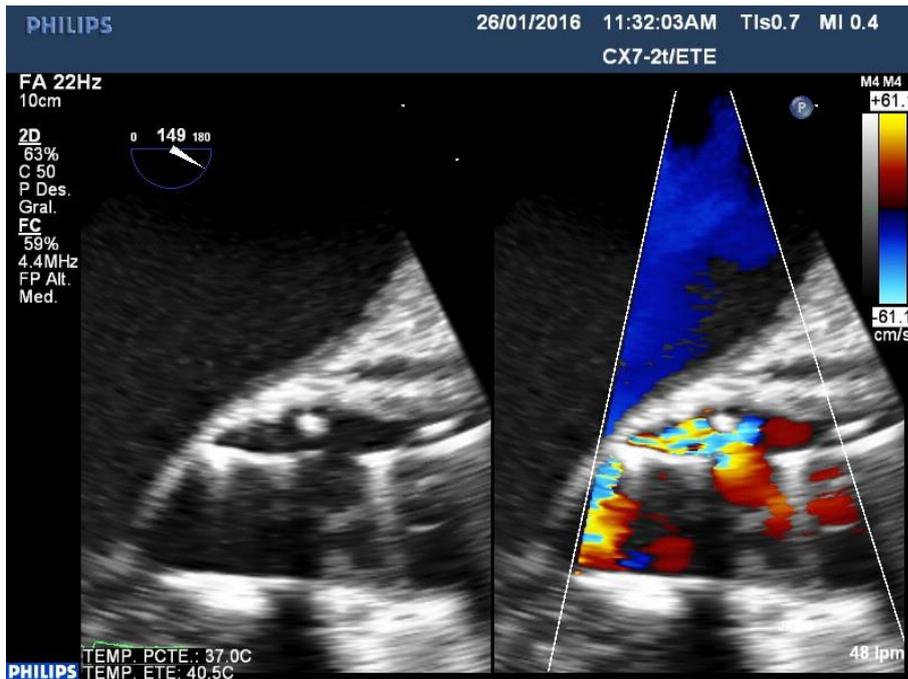
## INDICATION FOR INTERVENTION

Severe paravalvular aortic regurgitation two months after TAVI and heart failure situation.

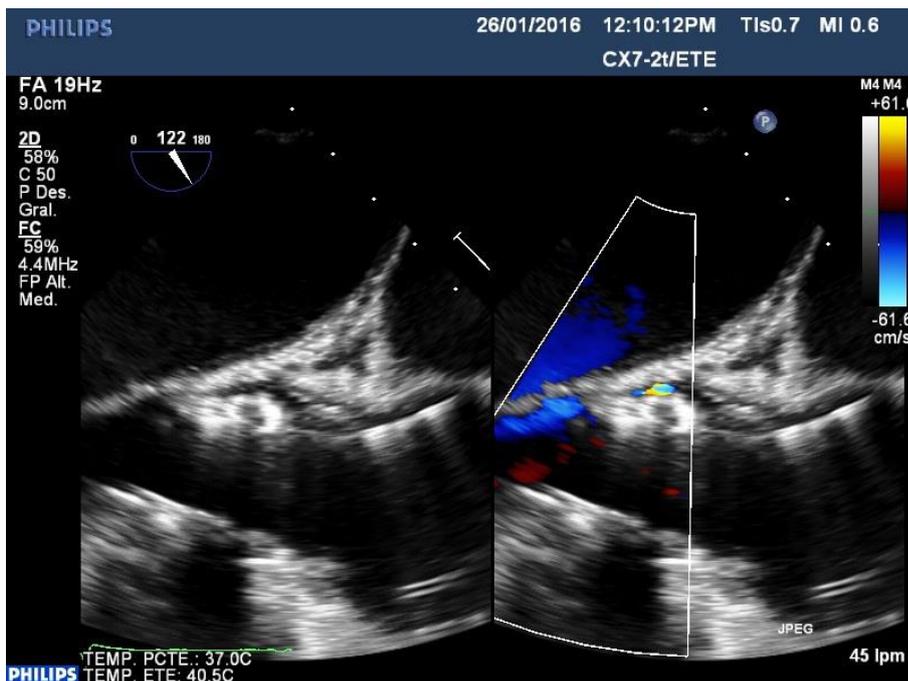
## INTERVENTION

After multidisciplinary team evaluation, we decided for percutaneous closure. An 8 x 4 mm Amplatzer Vascular Plug™ (AVP) III (St. Jude Medical) was successfully deployed, guided by fluoroscopy and 2D-3D TEE. Final PAR was mild to moderate by TEE quantification (Figure 2).

The patient was discharged 72 hours after the intervention, performing transthoracic echocardiography evaluation to confirm the absence of complications and the mild residual PAR. Clinical 6 months follow-up reports improvement in functional class.



**Figure 1.** TEE long-axis LVOT view of Portico™ 25 mm prosthesis with severe posterior PAR. Stent frame malapposition due to severe calcification.



**Figure 2.** TEE long-axis LVOT view showing PAR reduction with the plug *in situ*.

### LEARNING POINTS OF THE PROCEDURE

Severe paravalvular aortic regurgitation is consolidated as a predictor of short and long-term prognosis after TAVI. We are constantly learning about this issue in order to accomplish the most accurate way to measure and manage it, the multimodal evaluation being a key point. Many devices have emerged to take that role in a percutaneous context, with varying success rates. We report, to our knowledge, the first case of severe symptomatic paravalvular aortic regurgitation after Portico™ TAVI successfully treated with AVP III. The open cell design in Portico™ valve allows larger catheters to access towards

the defect and may facilitate the procedure. Paravalvular leak closure with AVP III has demonstrated to be safe in larger series, with a low rate of serious complications. We consider that 2D-3D TEE guidance is mandatory to ensure the best possible result.