

CARDIOVASCULAR FLASHLIGHT

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Transcatheter tricuspid valve-in-ring placement: complex valve obstruction by hypo-attenuating leaflet thickening, hypo-attenuation affecting motion, and native tricuspid valve remnant

Marguerite E. Faure^{1*}, Nicolas M.D.A. van Mieghem², and Ricardo P.J. Budde¹

¹Department of Radiology & Nuclear Medicine, Erasmus MC, Rotterdam, The Netherlands; and ²Department of Cardiology, Erasmus MC, Rotterdam, The Netherlands.

*Corresponding author. Tel: 0032479419175, Fax: 003233205774, Email: marguerite_faure@hotmail.com

We present a 78-year-old woman with a prior history of surgical mitral and tricuspid annuloplasty repair that was complicated by mediastinitis.

She presented now with progressive dyspnoea, right ventricular failure, and severe tricuspid insufficiency. Because of the complex medical history, age, and poor clinical condition, a percutaneous procedure was preferred. After implantation of a SAPIEN valve, there was a moderate residual paravalvular leakage which was closed with an amplatzer vascular plug (AVP)3 plug (Panel A). Transthoracic echography, performed 2 days after surgery, showed an elevated pressure gradient (mean gradient 6 mmHg) across the tricuspid valve, indicating significant stenosis (Panel B). This was confirmed 6 months later (mean gradient 7 mmHg), followed by a cardiac computed tomography (CT) scan to determine the cause of the elevated gradient, using a dedicated dynamic heart valve protocol with reconstructions in 15 phases of the cardiac cycle. CT showed the SAPIEN valve in tricuspid position with the plug next to it (Panel C). There is thickening of two of the three valve leaflets with reduced leaflet mobility, suggesting hypo-attenuating leaflet thickening (HALT) with hypo-attenuation affecting motion (Panels C and D, [Supplementary material online, Video S1](#)). Furthermore, a remnant of the native tricuspid valve is identified as a hypodense structure at the ventricular side of the stent, also partially obstructing the stent outflow (Panels E and F, [Supplementary material online, Video S2](#)). After 6 weeks of intense oral anticoagulation therapy aiming for an international normalized ratio (INR) of 3, mean gradient across the SAPIEN valve dropped to 3 mmHg, suggesting leaflet thrombosis as the most probable cause of the leaflet thickening.

(Panel A) Fluoroscopic appearance of the SAPIEN valve during placement, while injecting the right ventricle with contrast. Note the markers of the AVP3 plug next to the valve (arrows). (Panel B) Transthoracic echocardiography showing elevated pressure gradient. (Panel C) Short-axis CT image of the SAPIEN valve in tricuspid position and the plug next to it showing HALT of two of the valve leaflets (arrows). The AVP3 plug is also depicted (dotted arrow). (Panel D) Long-axis CT image of the SAPIEN valve showing HALT of two of the leaflets (arrows). Also note the pacemaker lead, placed to treat total AV block, developed recently after the procedure. (Panel E) Four-chamber CT view showing the additional hypodense structure at the ventricular side of the stent, which is a remnant of the native tricuspid valve (arrow). The plug is also demonstrated (dotted arrow). (Panel F) Pre-operative axial CT showing the tricuspid ring with native tricuspid leaflet in the same position and with the same geometry as the additional hypodense structure (arrow).

[Supplementary material](#) is available at *European Heart Journal* online.

