Transcatheter Simultaneous Double-Transapical Access for Paravalvular Mitral Leak Closure Using the Occlutech PLD

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ABSTRACT: A 67-year-old patient with rheumatic heart valve disease had undergone two cardiac surgeries at the age of 30 years, then re-do with mitral valve replacement at 50 years. She presented with congestive heart failure and hemolytic anemia. Doppler echocardiography showed moderate-severe mitral regurgitation due to paravalvular mitral valve leak (PVML) and severe pulmonary hypertension. Transesophageal echocardiography demonstrated severe PVML secondary to a large 20 mm-long PVML defect. Due to comorbidities, the heart team deemed a third reoperation a very high surgical risk; therefore, the patient was considered most suitable for a transcatheter approach to PVML closure. Two Occlutech paravalvular leak devices were successfully delivered using a simultaneous double-transapical access with double-wire technique.

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FIGURE 1. Paravalvular mitral leak closure. (A) Transesophageal echocardiography (TEE), 2-chamber view of mechanical mitral valve (MMV) showing severe paravalvular mitral leak [Video 1]. (B) Transgastric, short-axis view showing a 20 mm paravalvular mitral leak defect. (C) Three-dimensional TEE showing a crescent-shaped, large posterolateral disconnection (oval). The Occlutech paravalvular leak device is available in (D) rectangular and (E) square shapes. (F) Fluoroscopy showing two J-type guidewires [arrows] across the defect, confirmed by (G) three-dimensional TEE [black arrows] [Video 2]. (H) A 12 mm Occlutech paravalvular leak device with a rectangular waist was advanced through the 12 Fr short sheath and opened into the left atrium [Videos 3-5]. (I) A single device was not enough to close this large paravalvular mitral leak defect as depicted by three-dimensional TEE; the black oval highlights the remaining uncovered defect with the second wire in place [the first Occlutech is indicated by the black arrow].
FIGURE 2. Paravalvular mitral leak closure and postprocedural result. (A) Three-dimensional transesophageal echocardiogram (TEE) volume rendering of moderate paravalvular mitral leak (white circle; white arrow indicates the first Occlutech). (B) Therefore, a 5 mm Occlutech square-twist paravalvular leak device was advanced through the 8 Fr short sheath (white arrows indicate the first Occlutech; black arrow indicates the second Occlutech) [Video 6]. (C) After three-dimensional TEE confirmed correct position, both Occlutech paravalvular leak devices were simultaneously released (arrows) [Video 7]. (D) Fluoroscopy and (E) three-dimensional TEE showing the final result of the two Occlutech paravalvular leak devices (arrows). (F) TEE showing trace residual shunt [Video 8].