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CARDIOVASCULAR FLASHLIGHT
Valvular heart disease

Critical clip opening while locked: a rare phenomenon after transcatheter edge-to-edge mitral valve repair

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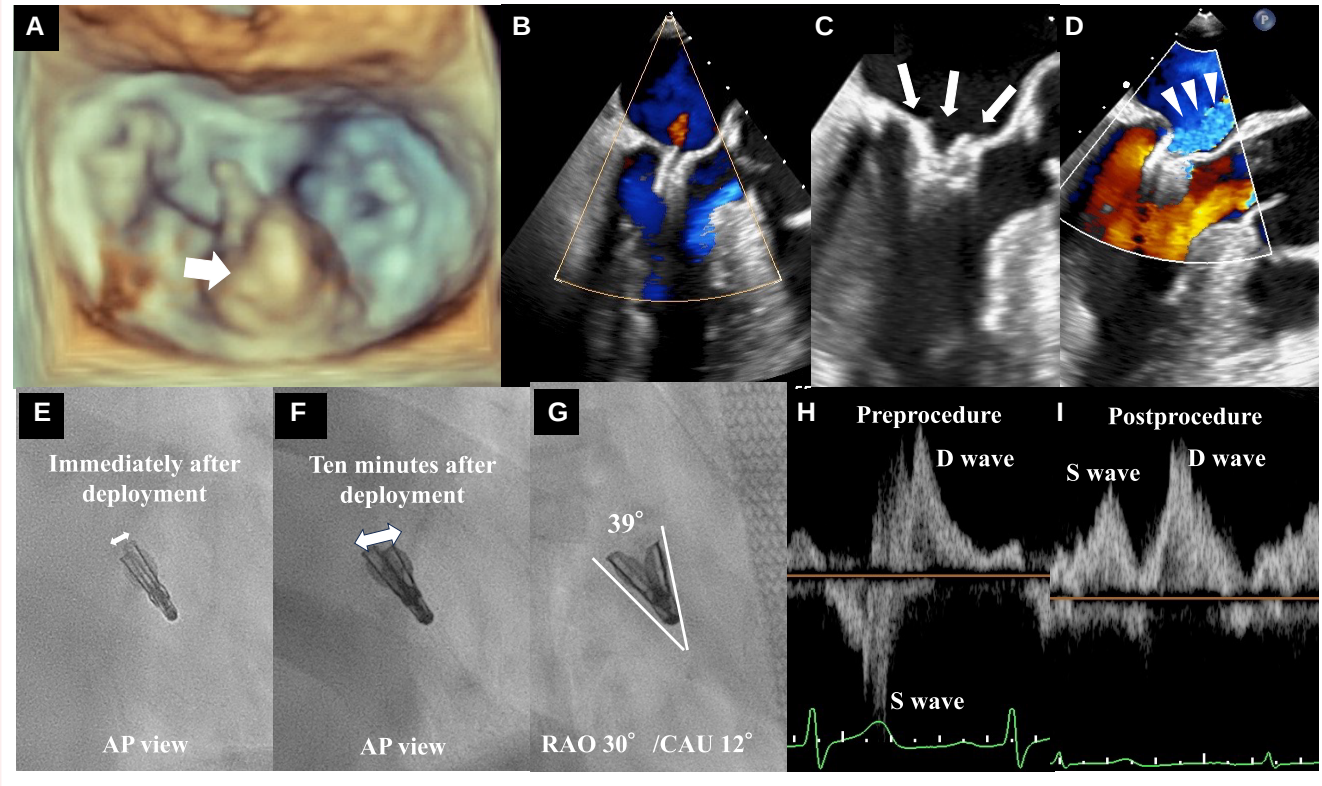

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An 86-year-old man suffered from dyspnoea due to severe mitral regurgitation (MR) with posterior mitral leaflet prolapse at the P2 segment (*Panel A*; Supplementary material online, *Video S1*). Because his surgical risk was high, he underwent transcatheter edge-to-edge mitral valve repair (TEER). We used the MitraClip G4 XTW Clip Delivery System (Abbott Vascular, Abbott Park, IL, USA) to grasp both leaflets at the A2 and P2 segments. We deployed the clip after performing Establish Final Arm Angle and Lock Line Removal. Transoesophageal echocardiography (TEE) revealed a mild reduction in MR (*Panel B*). However, ∼10 min after the deployment, TEE revealed that MR was increased and that the clip was open wider than immediately after its deployment, with a dancing-like motion (*Panels C* and *D*; Supplementary material online, *Video S2*). Fluoroscopy revealed that the clip was obviously open at an angle of ∼39° (*Panels E–G*). We assumed that clip opening while locked (COWL) had occurred. Because space for another clip at the A2 and P2 segments was lacking, additional TEER seemed impossible. In addition, the pulmonary vein flow had normalized (*Panels H* and *I*), and the patient's haemodynamics were stable. We decided not to perform additional interventions. The patient's symptoms improved, and he was discharged 10 days after the operation. Echocardiographic follow-up revealed no increase in residual MR.

Clip opening while locked describes the phenomenon where the clip arm angle increases by >10° from the angle at deployment, which can cause critical adverse effects. This phenomenon can be identified by fluoroscopy or TEE, as shown in this case. Fluoroscopy and TEE images obtained in this case depict this rare phenomenon. Surgeons and sonographers should be widely aware of this.

Critical clip opening when locked. Rare phenomenon after transcatheter edge-to-edge mitral valve repair. (*Panel A*) Transoesophageal echocardiography revealed severe mitral regurgitation with posterior mitral leaflet prolapse at the P2 segment (white arrow). (*Panel B*) Transoesophageal echocardiography revealed mild reduction in mitral regurgitation after clip deployment. (*Panels C* and *D*) Transoesophageal echocardiography revealed that the clip opening was wider (*Panel C*, white arrows) and mitral regurgitation was greater (*Panel D*, white arrowheads) ∼10 min after deployment than immediately after deployment. (*Panels E* and *F*) Fluoroscopy revealed that the clip was obviously open in the anteroposterior view. (*Panel E*) Immediately after deployment. (*Panel F*) Ten minutes after deployment. (*Panel G*) In the right anterior oblique 30°/caudal 12° view, the clip was open at an angle of ∼39°. (*Panels H* and *I*) Pulmonary vein flow normalized after the procedure. (*Panel H*) Preprocedural image. (*Panel I*) Postprocedural image. AP, anteroposterior; CAU, caudal; RAO, right anterior oblique.

Supplementary material

Supplementary material is available at *European Heart Journal – Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this report, including the images and associated text, was obtained from the patient in accordance with COPE guidelines.

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Data availability

The data underlying this article will be shared upon reasonable request to the corresponding author.