

Percutaneous transmitral commissurotomy in calcified, restenosed mitral valve: a technical challenge

Przezkórna komisurotomia mitralna zwapniałej, ponownie zwężonej zastawki: trudny technicznie zabieg

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A 31-year-old male presented with exertional dyspnoea, New York Heart Association III for the past two years. He had gone percutaneous transmitral commissurotomy (PTMC) 12 years before. Transthoracic echocardiogram revealed severe mitral stenosis with a mitral valve area of 0.8 cm², and Wilkin's score 8/16 (M₂, C₂, T₂, S₂). Transoesophageal echocardiography was done to look for left atrial clot, degree of mitral regurgitation, and suitability of PTMC. PTMC was planned after procedural consent. The interatrial septum was punctured with a Brockenbrough needle and the septum was dilated. Subsequently, an Accura balloon (Vascular Concepts, Essex, UK) was introduced. After multiple attempts, with difficulty, the mitral valve was crossed. While inflating the balloon, it took a bizarre shape and was therefore withdrawn, showing a proximal tear (Fig. 1A, B). The procedure was successfully executed with another balloon, achieving valve area of 1.9 cm² (Fig. 2A, B). The Accura balloon is composed of three layers — an intermediate mesh layer sandwiched between two latex layers. The mesh regulates the maximum diameter and internal pressure of the balloon, thereby regulating its inflation. Mesh damage may be due to over-inflation, or rapid increase of inner pressure during inflation, especially if it encounters a calcified valve. Therefore, the maximum recommended pressure should not be exceeded while preparing the balloon prior to the procedure, and diluted contrast medium should be slowly injected during test inflation to avoid rapid stretching of the mesh layer. Deformation of balloon architecture is a harbinger of tear, which in itself is very rare and is mostly reported in the distal part of the balloon, although two cases have been reported in the proximal part as well. Rupture is mostly partial and self-contained, but if complete then there is potential of embolisation of the latex material, mesh, or air if there is any volume of air with contrast inside the balloon. Calcium over the valve may be the offender by causing a tear either by abrasion or avulsion under high transmitral gradient while crossing the mitral valve, as noted in our case, where the valve was calcified and severely stenosed.

Learning points: 1. Rupture of balloon catheter is a concern while intervening a calcified, restenosed valve. 2. Though all cases until now have been reported with an Innoue balloon, the Accura balloon is not immune to rupture. 3. Mostly reported in the distal part of the balloon, it can occur in the proximal part of the balloon as well.

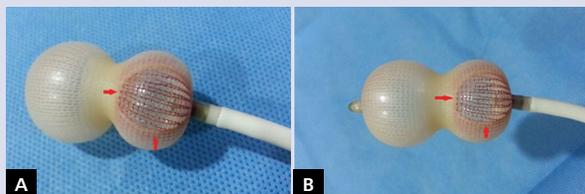


Figure 1. A, B. Partial tear in proximal part of Accura balloon showing proximal bulging of mesh layer (red arrow)

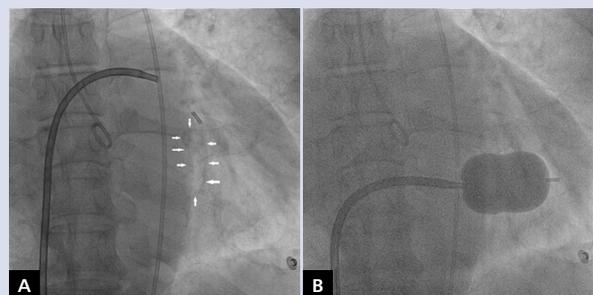


Figure 2. A. Calcified mitral valve (white arrow showing calcium); **B.** Successful percutaneous transmitral commissurotomy as Accura balloon is perfectly expanded at its waist across the mitral valve

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Conflict of interest: none declared

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