Case Report
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Percutaneous Balloon Pulmonary Valvuloplasty (PBPV) in Calcified Pulmonary Valve - A Technical Challenge

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Keywords

Pulmonary stenosis; Percutaneous balloon pulmonary valvuloplasty; Balloon tear

Case Report

Transcatheter therapy of valvular pulmonary stenosis is now treatment of choice for significant pulmonary stenosis. Here, we report a case of partial rupture of Accura balloon (Vascular Concept, UK) while Percutaneous Balloon Pulmonary Valvuloplasty (PBPV) was being performed in a tightly stenosed and calcified valve. A 43-year-old female presented with exertional dyspnoea, palpitation and fatigue for last 2 years which had progressed to NYHA class III. Electrocardiogram showed right axis deviation and right ventricular hypertrophy. Echocardiography showed dilated right atrium, right ventricle and severe Tricuspid Regurgitation (TR) with TR velocity of 6 m/s. Parasternal short axis view showed thickened, calcified pulmonary valve with doming having peak instantaneous gradient of 156 mm Hg across the pulmonary valve. Pulmonary valve annulus was 22 mm. With informed consent, PBPV was planned. The pulmonary valve was crossed with a 6F Multipurpose (MPA) catheter with help of 0.035" terumo wire (Terumo Inc, Japan). Terumo wire was exchanged with 0.025" left atrial stainless steel guide wire with putting its loop in left pulmonary artery branch for better support. Venous sheath was withdrawn, local site dilated with 12F dilator to facilitate entry of Accura balloon. The balloon was slenderized by removing metal stretching tube once it reached right atrium. It was gently negotiated across the pulmonary valve with gentle clockwise turn and push (Figure 1A and 1B). While inflating the balloon, it took a bizarre shape and therefore withdrawn showing a tear (Figure 2A and 2B). Procedure was successfully completed using another balloon. The residual gradient was 16 mm Hg.

PBPV is usually performed using Tyshak II because of its low profile and excellent trackibility but fixed size, longer inflation and deflation time, balloon slippage (watermelon seeding) and sometimes, periprocedural hemodynamic instability are few of its disadvantages. Inoue BMV balloon have been also utilizes as reported Patel et al., [1] and Bahl et al., [2]. Accura Balloon, a triple layered structure where two latex layers sandwiches intermediate mesh layer. Intermediate layer regulates maximum diameter and internal pressure of the balloon, thereby regulates its inflation. Mesh damage may be due calcific spurs present on a calcified valve which may cause tear either by abrasion or avulsion under high transpulmonary gradient while crossing the valve as noted in our case where valve was calcified and severely stenosed. Deformation of balloon architecture is harbinger of tear which in itself is very rare and rarely reported in cases of PBPV. Rupture is mostly partial and self contained, but if complete then there is risk of embolization of latex material, mesh or air.

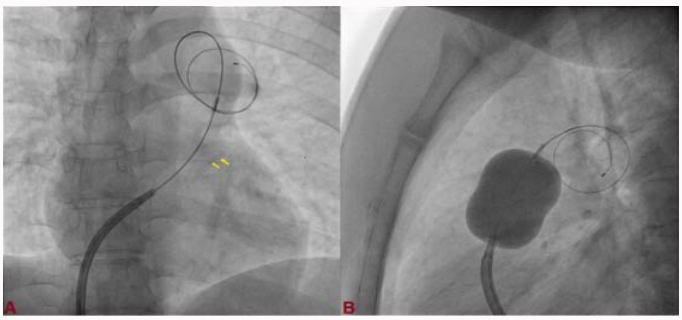

Figure 1: A) Accura balloon was slenderized by removing metal stretching tube once it reached right atrium and was gently negotiated across the calcified pulmonary valve (yellow arrow) and B). Procedure was successfully completed using another balloon.

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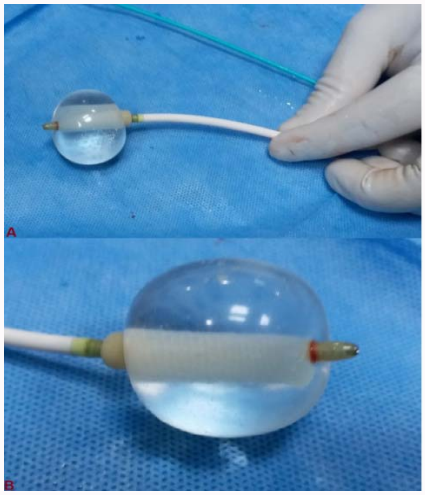

Figure 2: A&B) Accura balloon showing partial tear as evident by bizarre shape en-vitro on inflation.

Learning Points

1. PBPV is though safe with remarkably minimal complications.

2. PBPV can be successfully done by using Accura balloon but needs to be slenderized by pulling metal stretching tube once it reaches right atrium to facilitate its delivery across the pulmonary valve.

3. Rupture of balloon catheter may be a concern while intervening a calcified valve.

References

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