



## **BREAKING BAD- FRACTURING A BPV AND PERFORMING VIV PPVI IN A PATIENT WITH PA STENTS**

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A 43-year-old gentleman born with tetralogy of Fallot underwent a complete repair with tranannular patch repair at 3 years of age. He developed progressive severe pulmonary regurgitation and bilateral branch pulmonary arterial stenosis. At 33 years of age, he underwent surgical pulmonary valve replacement with a 25 mm Perimount 2800 BPV and intraoperative implantation of kissing Palmaz XL stents within the right and left pulmonary arteries. In the post-operative period, the RPA stent was found to have embolized to the distal vessel. Throughout the ensuing decade, the patient developed mixed pulmonary valve disease. The patient was referred to the cardiac catheterization laboratory for intentional fracture of bioprosthetic pulmonary valve and transcatheter pulmonary valve-in-valve replacement.

The cardiac catheterization data revealed the RVP was 78% systemic secondary to a peak gradient of 31 mmHg across the BPV. The RVEDP had elevated to 21 mmHg. Distal LPA wire position was performed, and angiography revealed narrowing at the BPV and proximal LPA stent. The proximal LPA stent appeared irregular due to surgical augmentation. The LPA stent was dilated with a 26mm x 2cm Atlas Gold balloon, though it developed a proximal small pinhole during inflation. A second balloon was used to dilate the LPA stent and it was felt rough edges of the stent were no longer pointing towards the lumen of the vessel. The new 26mm x 2cm Atlas Gold balloon was then inflated across the BPV to ensure the coronary arteries were remote from the BPV. At full inflation, the distal balloon was adjacent proximal to the LPA stent and no balloon injury occurred. We decided to use an Atlas balloon with longer shoulders to fracture the BPV. A 26mm x 2cm Atlas balloon was used to fracture the BPV with no injury to the balloon. A 26mm Sapien 3 valve was implanted directly on the delivery balloon and positioned across the BPV, proximal to the LPA stent. The valve was delivered with a single inflation to 25 mL of contrast solution. At full inflation, the delivery balloon ruptured (Video 1). The valve remained in stable position as the delivery balloon was carefully removed. The 26mm x 2cm Atlas balloon was advanced again over the wire to the inferior vena cava. As the long sheath had been positioned in the IVC for valve implantation, the Atlas balloon was partially inflated and used as a dilator to transition the sheath across the tricuspid valve. The Atlas balloon was deflated, and carefully advanced across the newly implanted Sapien 3 valve. The balloon was inflated twice to 4 atmospheres to better approximate valve to BPV frame. There was no injury to the balloon, and it was removed. Final angiography showed a good result with no regurgitation (Video 2). Following the intervention, the RV pressure was reduced to 36% systemic with a residual pulmonary valve gradient of 6mmHg.

### **Learning points of the procedure**

- Be mindful of stents adjacent to intended interventions
- Anticipate, avoid, and plan for possible complications