

**Title:** Percutaneous Implantation of the Edwards SAPIEN 3 Transcatheter Heart Valve System with Alterra Adaptive PreStent for Severe Pulmonary Insufficiency in the Setting of Biventricular Assist Devices

**Authors:** Radha Kanneganti Perue, MBBS, MPH; Kristen N. Brown, MD; Jeffrey W. Delaney, MD; Ronald Zolty, MD, PhD

**Affiliations:** University of Nebraska Medical Center, Omaha, NE.

### **Background:**

The Edwards SAPIEN 3 Transcatheter Heart Valve (THV) System with Alterra Adaptive PreStent (AAP) was designed for abnormally formed, enlarged right ventricular outflow tracts (RVOT) and FDA approved in December 2021. We present the first known successful implantation of the SAPIEN 3 THV with APP in a non-surgical candidate with severe pulmonary insufficiency (PI) failing biventricular mechanical support, with subsequent improvement in hemodynamics.

### **Case:**

A 64-year-old woman with pulmonary hypertension, severe tricuspid regurgitation and stage D non-ischemic cardiomyopathy status post Heart Mate 3 Left Ventricular Assist Device (LVAD) had her post operative course complicated by persistent severe right ventricular failure (RVF) despite biventricular mechanical support. She was ultimately found to have acute severe PI with flail anterior leaflet, possibly iatrogenic from traumatic Swan-Ganz manipulation. The regurgitation rendered the RVAD ineffective. With an enlarged RVOT and being too high risk for surgery, she was urgently evaluated for an Alterra/Sapien pulmonary valve replacement (PVR). The RVAD was removed and the preStent and valve were successfully deployed. Hemodynamics improved, without need for RVAD support. Inotropic support was then successfully weaned.

### **Discussion:**

Acute severe PI may be missed as a cause of persistent RVF despite biventricular support as RVF is common post-LVAD implantation. As seen here, acute severe PI with concomitant severe TR can cause devastating RVF. The new percutaneous SAPIEN 3 THV with AAP is an option for dilated RVOT and should be considered to achieve hemodynamic stability.

### **Conclusion:**

Percutaneous PVR using the Edwards SAPIEN 3 THV with AAP system is a possible treatment option for non-surgical candidates with severe acute native PI contributing to severe RVF and failure of mechanical biventricular support, even under urgent or emergent circumstances. Restoring pulmonary valve competence may enable adequate forward flow and eliminate need for RVAD.

### **References:**

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