JACC: CARDIOVASCULAR INTERVENTIONS
VOL. ■, NO. ■, 2018

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER
https://doi.org/10.1016/j.jcin.2017.11.014

IMAGES IN INTERVENTION

Native RVOT Transcatheter Pulmonary Valve Replacement Without Pre-Stenting

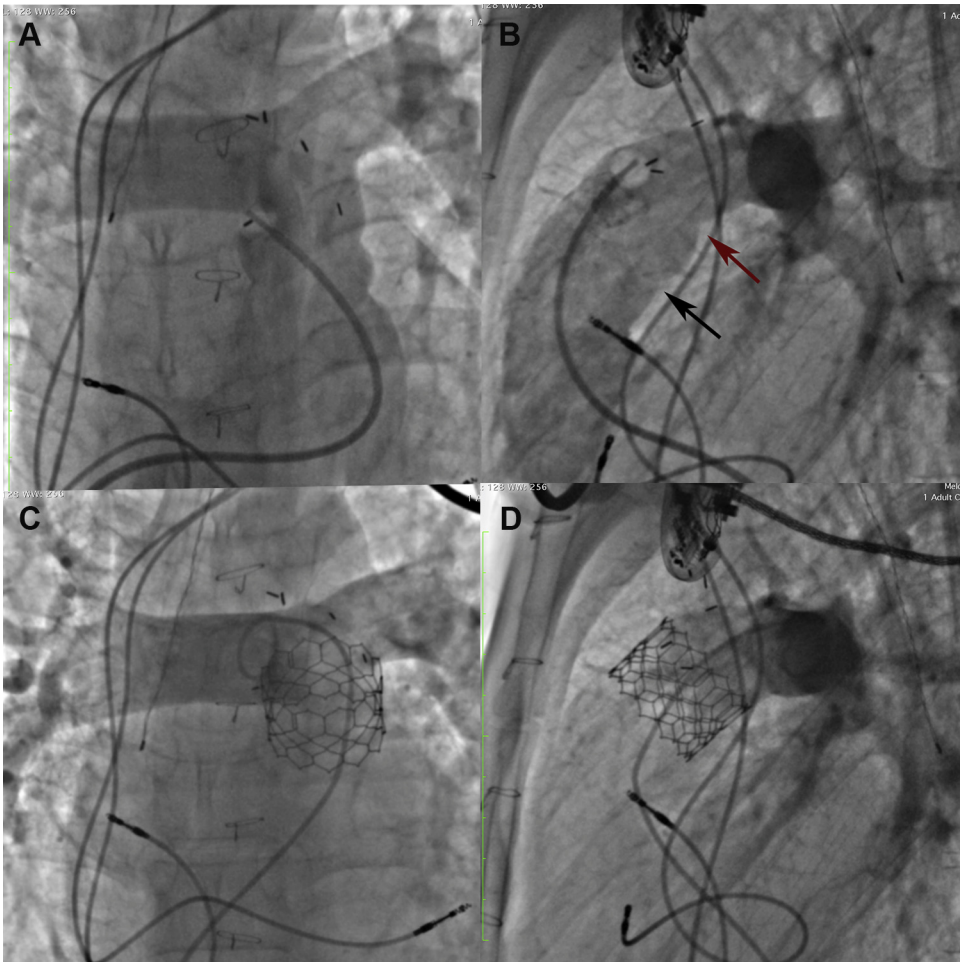
Joanna Ghobrial, MD, MS,[a] Daniel S. Levi, MD,[b] Jamil Aboulhosn, MD[a]

A 31-year-old man with history of tetralogy of Fallot, status post-surgical repair with a transannular patch repair, and patch closure of the ventricular septal defect as a neonate, presented with symptomatic severe pulmonic regurgitation (PR). Additional pertinent medical history included history of tachyarrhythmias and atrioventricular block status post-dual-chamber pacemaker and history of severe food allergies at one point leading to severe malnutrition requiring a period with gastrostomy tube, now removed. The patient presented in 2015 with progressive exertional dyspnea. His echocardiogram demonstrated severe PR, pulmonary artery (PA) and right ventricular outflow tract (RVOT) enlargement, with reduced RV systolic function. After heart team discussion the patient was deemed high risk for surgery and was evaluated for transcatheter pulmonary valve replacement. A computed tomography (CT) angiogram demonstrated a dilated PA with dimensions of 33 to 35 mm at the valve annulus and 25 mm superior to the annulus. The Melody valve (Medtronic Inc, Minneapolis, Minnesota) was deemed too small for this dilated native RVOT (up to 24 mm), and thus a SAPIEN valve (Edwards Lifesciences, Irvine, California) was more appropriate due to size availability of 29 mm. The procedure was performed under general anesthesia via percutaneous transfemoral venous access. RVOT and PA angiography demonstrated a minimal PA diameter of 25 to 28 mm (**Figures 1A and 1B**, Online Videos 1 and 2). After baseline aortic root and coronary aniography, a 30-mm PTS-X balloon (B. Braun Medical Inc., Bethlehem, Pennsylvania) was inflated for PA sizing showing a minimal waist of 27 to 28 mm. Simultaneous aortic root angiography and balloon inflation showed aortic root compression and slow flow in the right coronary artery (RCA), and left coronary artery (LCA) flow was uncompromised (**Figures 2A and 2B**, Online Videos 3 and 4). To evaluate whether this was true aortic root compression or if it was due to lack of forward blood flow from balloon occlusion, contralateral femoral venous access was obtained to perform double balloon sizing allowing for pulmonary blood flow around the 2 balloons. A 14-mm ZMED-II balloon (B. Braun Medical Inc.) and a 22-mm TRUE balloon (Bard PV, Tempe, Arizona) were advanced and simultaneously inflated in the PA with simultaneous aortic root angiography demonstrating no evidence of aortic root compression or coronary compression (**Figure 2C**, Online Video 5). A 29-mm SAPIEN 3 valve was advanced over the Commander system and deployed without pre-stenting with 5 ml in addition to the nominal volume of 33 ml, with rapid pacing at 160 beats/min (using his indwelling pacemaker). The valve was then post-dilated using 9 ml in addition to nominal volume in the delivery balloon to reduce any perivalvular regurgitation and ensure stable positioning (**Figures 1C and 1D**, Online Videos 6 and 7). Angiography demonstrated a competent pulmonary valve with trace central PR and no evidence of aortic root compression (**Figures 1C, 1D, and 2D**, Online Videos 8, 9, and 10). The patient was observed overnight. He was discharged home postoperative

From the [a]Department of Medicine, Division of Cardiology, University of California-Los Angeles, Los Angeles, California; and the [b]Department of Pediatrics Division of Pediatric Cardiology, University of California-Los Angeles, Los Angeles, California. Dr. Levi has served as a consultant and proctor for Edwards Lifesciences. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received September 12, 2017; revised manuscript received November 2, 2017, accepted November 7, 2017.

FIGURE 1 Pulmonary Artery Angiograms Before and After SAPIEN 3 Valve Deployment



(A) Pulmonary artery (PA) angiogram in the anteroposterior projection demonstrating dilated PA measuring 25 to 28 mm (Online Video 1). **(B)** PA angiogram in the lateral projection. Pulmonary valve annulus level is denoted with a **black arrow**, minimal PA diameter visualized is denoted with a **red arrow** (Online Video 2) **(C, D)**. PA angiogram in the anteroposterior and lateral projections after valve deployment demonstrating valve position and minimal residual pulmonary regurgitation (Online Videos 6, 7, 8, and 9).