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Acute Heart Failure after Percutaneous Pulmonary Valve (Melody© Valve) Placement

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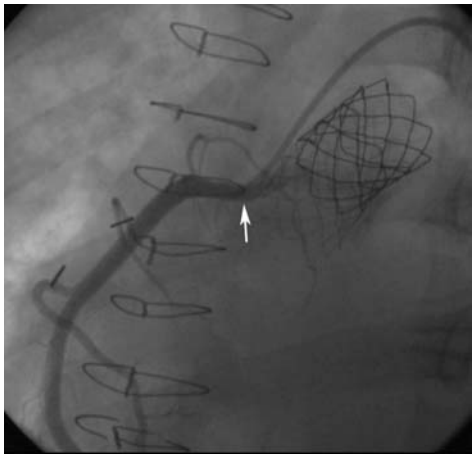
Introduction: We present a case of a 38 year old male with pre-existing left ventricular diastolic dysfunction who developed acute heart failure after Percutaneous Pulmonary valve implantation (PPVI).

Case Summary: His operative history consisted of initial subaortic resection at 3 years of age. At 13 years of age, he had placement of a left ventricle to descending aorta graft. At 20 years of age, a Ross procedure, with autograft pulmonary valve to the aortic position and an RV to PA homograft conduit.

Catheterization 10 months prior to admission revealed a 37mmHg RV conduit gradient. LV end diastolic pressure was 17 mmHg. (**Table 1)**. There was mild pulmonary regurgitation.

It was determined that he would be a candidate for PPVI, which was performed 4 months later. Coronary angiography performed with balloon dilation of the conduit showed no risk of coronary compression by valve placement. Implantation of a Melody valve (Medtronic, Minneapolis, MN) was performed without complication. Post-valve placement RV to PA peak systolic gradient was 17 mmHg. Left-sided hemodynamics were not re-measured. Three weeks post-implant, he was re-admitted with progressive symptoms of dyspnea. He had bilateral lung crackles, increased JVD to 8 cm, mild liver enlargement and lower extremity pitting edema. Chest x-ray showed bilateral pleural effusions. Echocardiogram documented good pulmonary valve function with mild stenosis (MIG = 20 mmHg; mean = 12 mmHg) and normal systolic function. Cardiac CT suggested impingement of the Melody stent on the right coronary artery but coronary angiography and cardiac enzyme levels were normal. (**Figure 1**) LV end diastolic pressure was found to be 45 mmHg (**Table 1**).



After aggressive diuresis and clinical improvement, he was dismissed home on furosemide 40 mg twice daily and losartan 100 mg.

Conclusions: This case illustrates a previously unreported side effect of Melody valve placement in an individual with pre-existing diastolic dysfunction—namely, acute elevation in left ventricular filling pressure due to increased LV preload. filling pressure(4).This case suggests that individuals with RV to PA conduit stenosis and underlying diastolic dysfunction may not experience prompt improvement in symptoms and may in fact have exacerbation of heart failure after PPVI.

Table 1. Invasive hemodynamics before and after PPVI

		08/2010		
	06/2009	Pre-PPVI	Post-PPVI	09/2010
RV systolic	66	69	59	--
RV EDP	13	20	23	--
PA systolic	29	30	42	--
LV systolic	109	100	--	115
LV EDP	17	26	--	45
CI (L/min/m^2)	2.5	2.4	--	--

Catheter-measured hemodynamics before, during and after PPVI. All pressures are in mmHg. RV = right ventricle; EDP = end diastolic pressure; PA = pulmonary artery; LV = left ventricle; CI = cardiac index.