HISTORY AND PHYSICAL

This is a case of a neonate who consulted due to cyanosis. He was born to a 25 year old G2P1 mother via normal spontaneous delivery. He had unremarkable birth and maternal history but was noted to have cyanosis on the 2nd day of life. He was brought to the Philippine Heart Center and was subsequently admitted. Physical examination reveals oxygen desaturation at 64% with a grade 3/6 continuous murmur on the left upper sternal border. 2D-echocardiography revealed CHD, D- Transposition of the Great Arteries with intact ventricular septum, Patent Ductus Arteriosus and Patent foramen Ovale. He underwent Arterial Switch Operation with PDA ligation and immediate improvement of the oxygen saturations was noted at 80 %. However, 2 months post-operatively, he presented again with desaturations as low as 50%. Repeat 2-dechocardiography showed supravalvar pulmonic stenosis with a gradient of 93 mmHg across the stenotic area. He was referred to Pediatric Invasive Cardiology for Percutaneous Pulmonic Balloon Valvulotomy.

Physical examination revealed vital signs as follows: cardiac rate of 130s, respiratory rate of 42 cycles per minute with oxygen saturation of 70-80%. He was awake with dusky oral mucosa. There was an equal chest expansion with no rales and wheezing. He had adynamic precordium, point of maximal impulse at 4th ICS, S1 normal, S2 single with 3/6 systolic ejection murmur at LMCL. Liver was not palpable with no abdominal masses. There were full equal pulses with dusky nailbeds.
INDICATION OF INTERVENTION

The development of pulmonary artery stenosis is a potential complication during the mid- to long-term follow-up after arterial switch operation (ASO) for transposition of the great arteries. Surgical results have been disappointing and conventional balloon dilation yields a fairly important incidence of failures and recurrences. The post-operative pulmonary gradient across the valvar and supavalvar area was noted to be severe at 93 mmHg. Patient presented with progressive desaturation despite undergoing total arterial switch operation hence balloon dilatation was considered.

INTERVENTION

Right heart catheterization was performed through a right femoral vein. A French 6 sheath was inserted and a French 5 JR4 catheter was manipulated under fluoroscopic guidance into the IVC, RA, RV, MPA and pulmonary artery. Under the same condition, left heart catheterization was performed via left femoral artery and a French 4 sheath was inserted and a French 4 pigtail catheter was inserted for monitoring during the procedure. After heparinization and hemodynamic measurements, a French 5 JR4 catheter was inserted through the right femoral vein and was manipulated into the IVC, RA, RA and into MPA. An Amplatzer exchange guidewire was inserted and placed in the peripheral pulmonary artery. The catheter was removed with the guidewire in place and replaced by TMP Ped pulmonary valvotomy balloon catheter measuring 6mm x 20mm was inserted and inflated. Then another TMP Ped pulmonary valvotomy balloon catheter measuring 8mm x 20mm was inserted and inflated until the waist disappeared, and 4 inflations of the balloon catheter was done. After pulmonic valvotomy, the PPBV catheter was removed and was replaced with the same French 5 JR4 catheter for repeat hemodynamic measurement. Pre-PPBV, the RV pressure
was at 76/4 mmHg with mean pressure 22 mmHg. The mean RA pressure was at 6 mmHg. The aortic systolic pressure was measured at 143/65 mmHg with mean pressure of 100 mmHg. Post-PPBV, the gradient across the pulmonic valve was at 34mmHg with the PA pressure at 21/6 mmHg with mean pressure of 14 mmHg and RV pressure at 48/5 mmHg. Aortogram was done and showed no constriction on the anastomosis of neoaorta and opacification of the right and left coronary arteries. RV cineangiography in the cranial and lateral projections showed coarse trabeculations of the RV, the stenotic pulmonary valve measuring 0.6 cm with doming motion of the valve leaflets and the narrow jet of contrast through the stenotic valve and supravalvar area with post-stenotic dilation secondary to the jet of blood that hit the MPA. The confluent pulmonary arteries and its distal branches were subsequently visualized. There was also note of infundibular narrowing at the RVOT.

LEARNING POINTS OF THE PROCEDURE

Post-arterial switch operation among patients with D-TGA with intact ventricular septum was a challenge from the start of diagnosis. There are several factors that determine the outcome and possible complications after the operation, from skills to technical aspects of the center. However, there are complications that cannot be avoided hence the need for innovative interventions that can help these patients. Post balloon the patient was noted to have decrease in the right ventricular systolic pressure of almost 50 %.There was also improvement in the saturation of the patients at 98% and patient was subsequently discharged.