

PTMC IN A DEXTROCADIA PATIENT- FIRST CASE REPORT FROM BANGLADESH: INNOVATIVE TECHNIQUE TO CROSS THE DIFFICULTIES

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A 35 yrs. old normotensive, nondiabetic lady was admitted in our National Institute of Cardiovascular Diseases with the complaints of shortness of breath and palpitation for last 6 years. The shortness of breath was progressive in nature and at presentation it was NYHA class III. She was hemodynamically stable with a regular pulse rate. She had dextrocardia with the apex beat in the right fifth intercostal space just medial to midclavicular line and was tapping in nature. The first heart sound and pulmonary component of the second heart sound were loud. There was a typical mid diastolic murmur of severe mitral stenosis with an opening snap.

Echocardiography showing situs inversus dextrocardia with severe mitral stenosis (MVA 0.7cm² in planimetry with MPG 13 mmHg) with Wilkin's score 7 and no significant mitral regurgitation.

Pulmonary artery systolic pressure (PASP) was measured at 54 mmHg. The left atrial appendage was free of thrombus on transoesophageal echocardiography (TEE.)

In this scenario, it was a class I recommendation for percutaneous transvenous mitral commissurotomy (PTMC). PTMC in the dextrocardia setting is challenging. Considering the vast experience of our center (more than 500 PTMC per year) we decided to proceed with PTMC.

Left femoral venous and arterial access were obtained. Transseptal puncture would be more difficult if performed via right femoral venous access. The radiographic image was inverted left to right on the screen by means of the built-in software system of the radiographic equipment (Philips) to project a "pseudo-normal" anteroposterior presentation (AP) when the C-arm was in the AP position, and a "pseudo-right anterior oblique (RAO) 30° position" when the C-arm was in left anterior oblique (LAO) 30°.

Transseptal catheterization was done keeping the external indicator of the Brockenbrough needle was at 8 o'clock position. The puncture site was confirmed using two views: "pseudo-AP" and "pseudo-RAO." 2500 U heparin was given.

The actual challenge then started. We were facing difficulties in crossing the mitral valve and we were in "Pseudo-RAO 30°" view on the screen. Several attempts with J shaped wire were failed and then we tried with the spring wire within the balloon and keeping the spring wire tip near the MV orifice but failed. Then the balloon was removed keeping the spring wire in LA. The Mullin's sheath was passed over the spring wire and kept in the MV orifice and then the wire was pushed into the LV. Ventricular ectopics and short run of ventricular tachycardia occurred and were well tolerated. Keeping the spring wire in LV the Mullin's sheath was removed and balloon was negotiated and serial balloon dilation were performed with balloon diameters of 24.5 mm and 25mm. Total procedure time was 65 mins and the fluoroscopic time was 25 min.

The haemodynamic changes after PTMC and the echocardiographic parameters 72 hours after PTMC are given in the Table 1. She was discharged on the third day and 3 months after the procedure she was doing well with no symptoms.

Table: Changes in parameter before and after PTMC

Parameter	Before	After
Mean left atrial pressure	48 mmHg	23 mmHg
Mean pulmonary arterial pressure	36 mmHg	25 mmHg
MVA in planimetry	0.74cm ²	1.95 cm ²
MVA with PHT	0.8cm ²	1.85cm ²
Mean pressure gradient	13 mmHg	4.1 mmHg
Pulmonary arterial systolic pressure	54 mmHg	32 mmHg

PTMC in dextrocardia with situs inversus is technically challenging. A review of the few cases of PTMC in patients with dextrocardia reported in the literature clearly confirms the difficulties to be expected in any catheterization or interventional procedure due to the distorted anatomy. The major anatomical variation increases the risk of cardiac perforation during transeptal catheterization and makes more difficult the passage through the mitral valve.

We took many measures for a safe and effective procedure. We took the left femoral access and we rotated the needle indicator in 8 O'clock position for septal puncture instead of 4 to 6 O'clock. Visualization of left atrial cavity was done by levophase of pulmonary angiogram in few case reports but we took the help from the modern technology where built in technique in the machine can inverse the image assuming a levocardiac one. Another measures that could be taken was that of TEE guidance during the procedure to guide the septal puncture. As it is not our routine practice, we didn't take it.

Our puncture was low in the septum as it was visualized during LA-graphy. So we faced difficulties in entering the LV. The technique we used here to cross the mitral valve was first described by Mnjunath et. al. We used this technique in several times in difficult situation to cross the mitral valve but all of them were in levocardia. Apart from being simple and safe, this technique reduces the procedural time considerably and requires no extra equipment.

The combination of image inversion and the over the wire entry into the LV made the procedure successful though it took more than double fluoroscopy time from our usual practice. Nonetheless, it is a fact that TEE guidance has been shown to be a useful adjunct for patients with cardiothoracic deformity or when difficulties are encountered in performing transseptal puncture. Taking the per procedural TEE guidance might make our case simpler. Stay cool and confident when everything is in reverse position.