



TISSUE VALVE REPLACEMENT FOR SEVERE CALCIFIC PULMONARY STENOSIS: A CASE REPORT

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ABSTRACT : Progressive pulmonary regurgitation leading to biventricular failure is a big problem after pulmonary stenosis relief or release of right ventricular outflow tract obstruction. This problem can be overcome by doing early pulmonary valve replacement by tissue valve or homograft.

We report a case of pulmonary valve replacement with tissue valve in case of severe calcific pulmonary stenosis.

KEYWORDS : Pulmonary valve, Calcification, Tissue valve

Introduction:

Calcification of pulmonary valve is uncommon and occurs exclusively in association with congenital pulmonary stenosis. Diagnosis of calcification is usually made during open heart surgery or at autopsy. Chronic volume overload due to relief of isolated pulmonary valve stenosis or after relief of right ventricular valve obstruction in TOF can lead to RV dilation, biventricular dysfunction, heart failure, arrhythmias, and sudden death. Pulmonary valve replacement (PVR) can lead to improvement in functional class and a substantial decrease or normalization of RV volumes) & improvement in exercise capacity.

Case report:

50-yr-old patient presented with a preoperative diagnosis of pulmonary stenosis for pulmonary valve (PV) replacement. His symptoms included chest heaviness and shortness of breath. On examination there was systolic thrill over the pulmonary area, lungs clear with no added sound. ECG showed heart rate 80/min, regular with right ventricular hypertrophy with strain. Chest X-ray showed cardiomegaly. Colour Doppler echocardiogram showed dilated RA, RV thickened and doming pulmonary valve with moderate to severe pulmonary stenosis (PPG; peak pulmonary gradient; 55), mod pulmonary hypertension (50 mm hg) & moderate TR.

After general anesthesia cardiopulmonary bypass was established with aortic and bicaval cannulation. Heart was arrested by giving cross clamp and antegrade cardioplegia under mild hypothermia (32°C). Main pulmonary artery opened with longitudinal incision. Pulmonary valve was found severely stenosed, pinhole and calcified (fig 1). Pulmonary valve replacement was done using 21mm SJM Trifecta tissue valve in supraannular position using interrupted pledgeted sutures (Fig 2). Pulmonary artery closed in double layer and right atrium sutured in single layer. Patient weaned from CPB uneventfully with NSR and optimal hemodynamics. X-clamp time-59min, Total bypass time-137 min. After achieving haemostasis chest was closed leaving two right ventricular epicardial pacing wire and two mediastinal chest drain (retrocardiac 32 Fr and right pleural 32 Fr) tubes attached with underwater seal drain bags. The patient was shifted to the intensive care unit with minimum inotropic support. Patient was extubated on the same day, shifted to ward on the 3rd post operative day and discharged home on the 10th postoperative day.



Fig 1. Calcified pulmonary valve

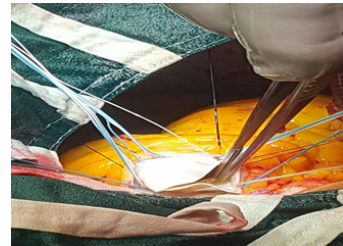


Fig2. Pulmonary Valve Replacement with Tissue Valve (central picture)

Discussion:

PVR should be done as early as possible for all patients with dilated RV and before development of irreversible RV dysfunction. Pulmonary valve replacement (PVR) can lead to improvement in functional class, improvement in exercise capacity and a substantial decrease or normalization of RV volumes.^{1,2}

Whereas calcification of the aortic and mitral valves is common, and calcification of the pulmonary valve is rare, and usually encountered either at operation or necropsy. Small deposits of calcium in one or more pulmonic valve cusps is seen in patients who lived into adulthood with left-to-right intracardiac shunts, and in older persons with severe pulmonary hypertension secondary to lung disease. Large deposits of calcium have been seen only in patients with severe pulmonic stenosis. Longstanding elevation of right ventricular pressure appears essential for the deposition of calcium. The role of aging and healed bacterial endocarditis in the etiology is uncertain.³ The current guideline of indications for pulmonary valve replacement is the onset of symptoms, progressive RV dilation, progressive tricuspid valve regurgitation or diminishing exercise tolerance.⁴

Conclusion:

Severe valvular pulmonic stenosis and survival into adulthood appear to be necessary prerequisites for the development of calcification of this valve.

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