

RECONSTRUCTION OF THE RIGHT VENTRICULAR OUTFLOW TRACT WITH A POSTERIOR MONOCUSP VALVE

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Reconstruction of the right ventricular outflow tract with sections of pericardium or with Dacron patches often leads to pulmonary regurgitation. This report presents a technique for minimizing regurgitation by creating a single posterior leaflet using the patient's own valve. After incision of the pulmonary artery and valvular ring, the valve is brought forward to cover the opening of the reconstructed pulmonary artery. This time-saving technique avoids the risk of calcification which usually accompanies the use of homografts and heterografts.

Reconstruction of the right ventricular outflow tract is often achieved by placing sections of pericardium or Dacron patches across the pulmonary valve annulus. Although the resultant pulmonic regurgitation is well tolerated in most cases,^{4, 5} the combined volume and pressure overload may lead to the development of aneurysms of the outflow tract¹ when associated with pulmonary hypertension or residual right ventricular obstruction. Although several techniques^{2, 3} have been described for reducing pulmonic regurgitation, all involve the use of either homografts or heterografts and are time consuming. We have devised a rapid, reproducible, and effective method for decreasing or preventing pulmonic regurgitation, using the patient's own valve to form a single posterior leaflet.

SURGICAL TECHNIQUE

A longitudinal incision into the pulmonary artery is extended across the pulmonary valve ring into the right ventricle. After incision of the commissural attachments to the pulmonary artery wall, the commissures are opened to the annulus (Fig. 1). The remnants of the anterior leaflet are excised (Fig. 2). The lateral attachments of the common posterior leaflet (in a bicuspid valve) or the two posterior cusps (in a tri-leaflet valve) are then detached from the wall and the free edges are sutured to the edges of the arteriotomy (Fig. 3).

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In this manner, the valve attachments are moved forward, increasing the leaflet's capacity for closure. After the section of pericardium or the Dacron gusset is sutured in place (Fig. 4), the posterior monocusp covers the entire area of the remaining pulmonary artery (Fig. 5).

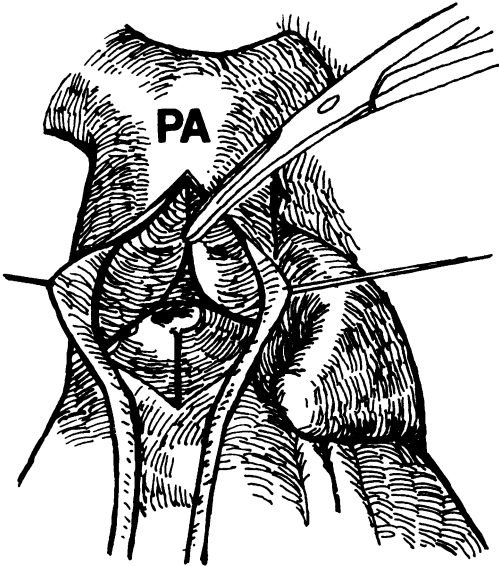


Fig. 1 Longitudinal incision in right ventricle extending across valve annulus into pulmonary artery. Commissural attachments are incised and commissures opened to annulus.

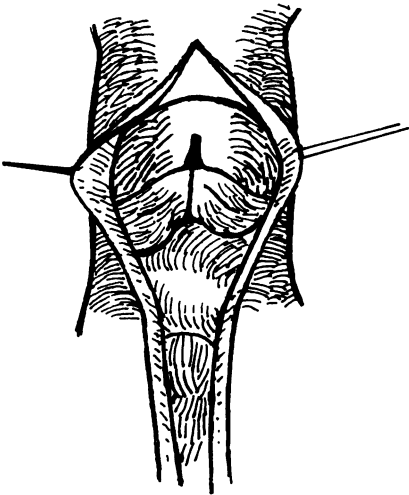


Fig. 2 Pulmonary artery is retracted and remnants of anterior pulmonary valve leaflet are excised.

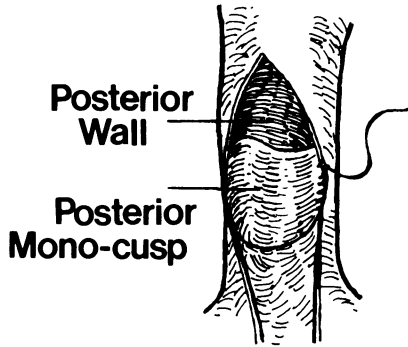


Fig. 3 Lateral attachments of residual valve leaflet are sutured to edges of arteriotomy, creating a single posterior monocusp.

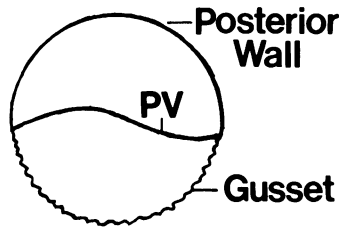


Fig. 4 Pericardium or Dacron gusset is sutured in place. Continuous sutures take in both pulmonary artery wall and edges of monocusp.

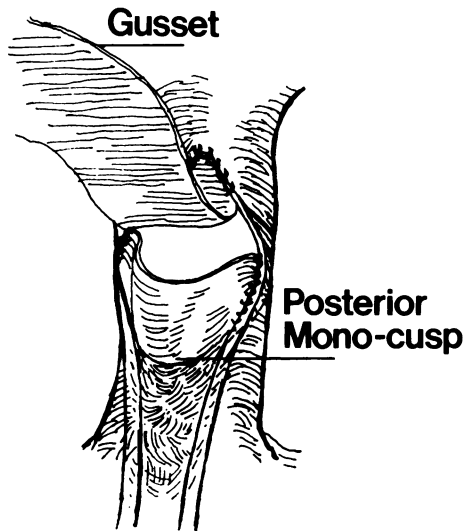


Fig. 5 Cross-section of pulmonary artery with gusset in place. Posterior monocusp covers entire area of remaining pulmonary artery.

DISCUSSION

Relief of stenosis is imperative in patients with right ventricular outflow obstructions. When patches are placed across the pulmonary valve annulus, pulmonic regurgitation is inevitable but does not normally result in increased postoperative mortality or morbidity. Some patients, however, develop progressive right ventricular dysfunction with decreased contractility and dilation of the right ventricular outflow tract. The technique presented here reduces pulmonic regurgitation while avoiding risks such as calcification associated with the use of homografts and heterografts.

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