

# Surgical Repair of Post-Repair Pulmonary Vein Stenosis Using “Sutureless” Techniques

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Surgical interventions on the pulmonary veins pose technical challenges at the time of repair, primarily the creation of an unobstructed anastomosis between the pulmonary veins and the left atrium. Among survivors, the incidence of postoperative pulmonary vein stenosis remains a troubling clinical reality with significant potential for morbidity and mortality. Potential etiologies of late pulmonary vein stenosis may include direct trauma of the pulmonary veins at the time of repair, and turbulence arising from geometric distortion of the pulmonary vein anastomosis due to imperfections in surgical technique. For example, the divided edges of the pulmonary vein confluence at the time of repair of total anomalous pulmonary venous drainage may have a complex morphology and, therefore, some distortion of these edges can be created at the time of primary anasto-

mosis. Against this background, sutureless techniques have evolved as a method to treat patients with recurrent pulmonary vein stenosis occurring after repair of total anomalous pulmonary venous drainage.<sup>1-3</sup>

Although initially described for repair of postrepair pulmonary vein stenosis, the “sutureless” technique is readily adaptable to primary interventions on the pulmonary veins.<sup>4</sup> The technique can be used to simplify complex pulmonary vein anastomoses by exploiting the intellectual leap that direct anastomosis of the left atrium to the pulmonary veins is not necessary—and that anastomosis of the left atrium to the posterior pericardium is sufficient to obtain hemostasis. Employment of this technique eliminates the potential for surgically induced geometric distortion of the anastomosis arising from the suture line itself. The divided edges of the pulmonary veins are left to float freely in a hemostatic “neoatrium,” which drains into the left atrium.

One of the compelling advantages of this technique is that it requires less technical precision than a direct anastomosis between the left atrium and the pulmonary veins—with important implications in terms of reproducibility and learning curve. Moreover this technique is easily adapted to a variety of surgical problems.

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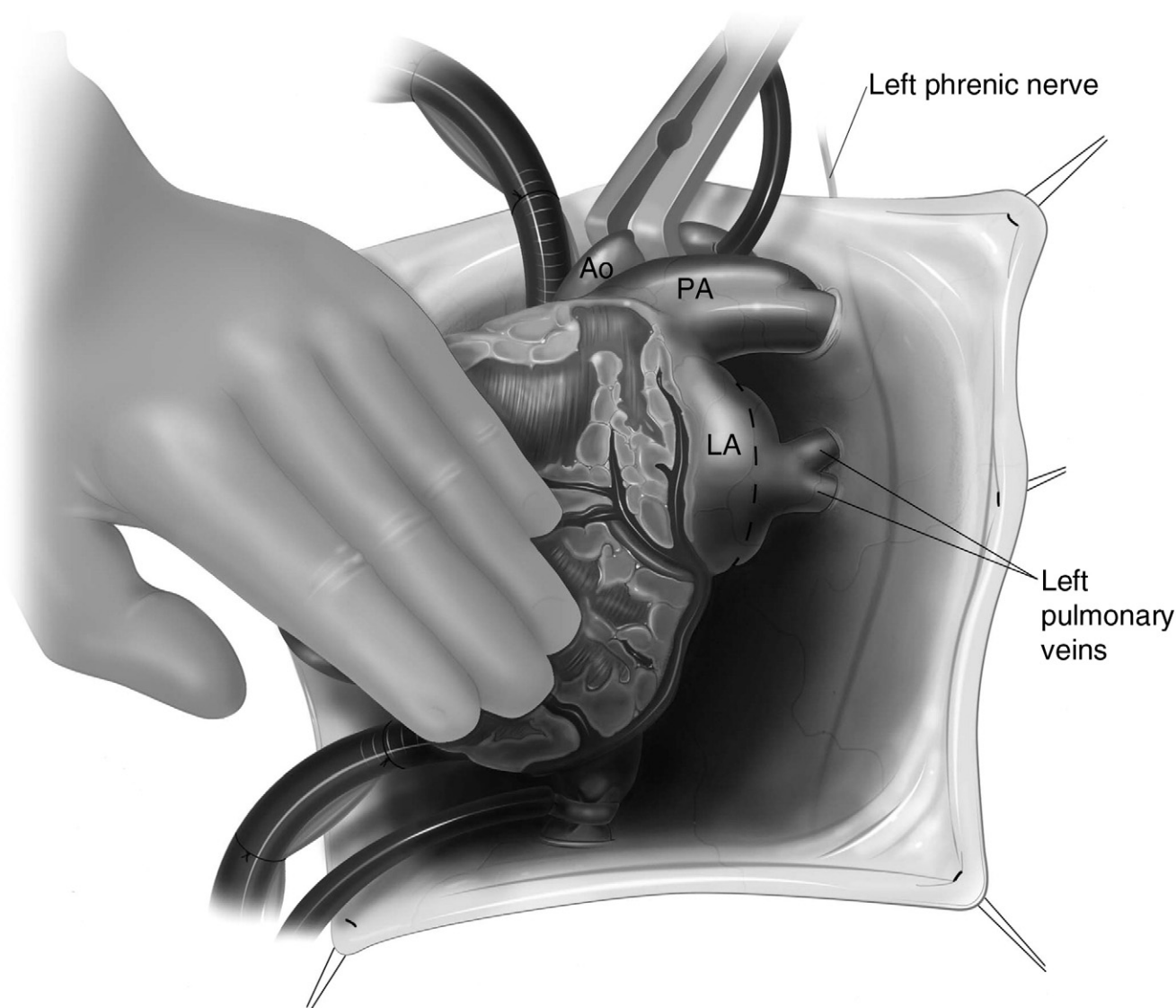
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## Operative Technique

### Repair of Bilateral Postsurgical Pulmonary Vein Stenosis with Atrio-Pericardial Anastomosis

Following a single lumen tracheal intubation and insertion of radial artery line and internal jugular venous line for monitoring, the patient is positioned on the table in a standard supine position. We routinely place a single towel roll under the shoulders oriented transversally to elevate the chest at the

level of the body of the sternum and gently distend the neck. The chest is prepped and draped. The anterior mediastinum is accessed via a median sternotomy. Aortobicaval cardiopulmonary bypass is instituted and the body temperature is lowered to moderate or deep hypothermia. The dissection of the posterior pericardium is completed in both the left and the right posterior pericardial fossa to allow good mobilization of the heart. After positioning of the cross-clamp, cardiac arrest is obtained with cold antegrade blood cardioplegia.



**Figure 1** Surgical exposure of the left posterior pericardial fossa in a patient with post-repair pulmonary vein stenosis is obtained by retraction of the heart cephalad and to the right. The area of the posterior left atrium, including the previous anastomosis with the venous confluence, is exposed. An incision on the left atrial wall is created parallel to the atrioventricular groove in a superior-to-inferior direction around the left side of the previously created anastomosis between the left atrium and the pulmonary veins. Ao = aorta; LA = left atrium; PA = pulmonary artery.

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