Reconstruction technique for a short recipient left atrial cuff during lung transplantation

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Abstract

A simple technique for reconstructing a short recipient left atrial cuff during lung transplantation is described. After opening the confluence of the pulmonary veins, the cut ends of the pulmonary veins are sutured together, posteriorly and anteriorly. This effectively lengthens the cuff allowing safe left atrial anastomosis. This technique has been applied in 3 patients with no technique-related complications.

Keywords: Lung transplantation • Left atrium • Reconstruction • Pulmonary veins

INTRODUCTION

Occasionally, during lung transplantation, the surgeon may encounter difficulty in obtaining an adequate cuff of recipient left atrial tissue to safely perform the anastomosis, despite very proximal placement of the partial occluding clamp. This problem is more likely to occur in obese patients (body mass index > 30) and those with idiopathic pulmonary fibrosis (IPF), although due to anatomical variation it is possible in any patient. Due to changes in lung allocation parameters, greater numbers of patients with IPF are receiving lung transplantation, making this problem more prevalent and one that we have encountered on several occasions. In this report, we described a simple technique to reconstruct the recipient left atrium allowing safe and expeditious left atrial anastomosis in this situation.

SURGICAL TECHNIQUE

Pneumonectomy is carried out in the standard fashion using vascular staplers to divide the pulmonary vasculature. The hilum is prepared and the bronchial and pulmonary artery anastomoses are performed, as previously described [1]. The left atrium containing the pulmonary veins is generously mobilized away from the pericardium circumferentially. With gentle traction on three Alice clamps grasping both pulmonary vein stumps and the confluence between them, a partial occluding clamp is placed across the left atrium as proximally as possible, isolating the pulmonary veins. Each pulmonary vein staple line is then resected and the intervening tissue divided to create the left atrial cuff.

If the confluence of the pulmonary veins is very close to the partial occluding clamp, the cuff of tissue may be too short to safely perform the anastomosis. In this situation, the pulmonary vein tissue is reconstructed to lengthen the cuff. This is simply accomplished by suturing the cut ends of the pulmonary veins together from the confluence back to the clamp to create the left atrial cuff (Fig. 1). A running 5-0 polypropylene suture is used and the suture line is created in such a way that the final knot is tied on the exterior of the atrium. This technique is typically applied to both the posterior and anterior surfaces, but occasionally may only be needed on one of the two. The resultant reconstructed left atrial cuff is of sufficient length to safely perform the venous anastomosis to the donor left atrial cuff.

With the growing numbers of lung transplants being performed, we suspect that surgeons will encounter this problem more frequently, especially in obese patients who often have very thick atrial tissue and short, widely spread pulmonary veins. Other options in this situation include (i) instituting cardiopulmonary bypass and doing an open venous anastomosis and (ii) attempting to place a more proximal clamp. The second option is less attractive as it might result in tearing of the left atrium and subsequent bleeding. The first option, while relatively safe, is time consuming and would increase the warm ischemic time, making it a less attractive option as well.

We have successfully used this technique in 3 patients and have found it to be a simple, reproducible and efficient way to reconstruct the recipient left atrium yielding an adequately sized cuff to safely perform the left atrial anastomosis. Intraoperative transoesophageal echocardiographic evaluation, in all cases, demonstrated normal blood flow velocities across the anastomosis. Postoperatively, patients were managed according to usual protocols with no need for additional anticoagulation. We have not encountered any technique-related complications including bleeding or narrowing of the pulmonary venous anastomosis.
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**REFERENCE**