cardiopulmonary bypass, with an excellent size match with the recipient.

Postoperative bronchoscopy showed moderate mucosal inflammation with intact anastomoses. The recipient was extubated after 5 days, transferred to the ward on day 10 and discharged on day 22. He continues to do well 8 months postoperatively, with satisfactory chest radiography, blood gas evaluation, and spirometry results.

DISCUSSION

Despite the shortage of organ donors, only 17% of donor lungs in the United States and 15% in the United Kingdom are used for transplantation, with “poor function” cited as the cause of 60% of donor organ rejections in North America.¹

Organ retrieval often involves thoracic and abdominal teams sharing operating space and working “against the clock.” Nevertheless, errors may have untoward consequences, such as the accidental delivery of pulmonoplegia at high pressure in this report. It is well established that high flow induces pulmonary vasculopathy as a result of high pressure and high shear stress with time,³ and flushing pressures lower than 20 mm Hg have been advocated for lung preservation.⁴ Assessment of lungs in a multiorgan donor is limited, however, by the necessity to maintain sufficient circulation and oxygen delivery to the other organ systems. In addition, there are no specific data on whether lungs subjected to excessive perfusion pressure sustain significant vascular barotrauma and whether such lungs can be successfully transplanted. The influence of high-pressure pulmonoplegia on primary graft dysfunction is also unknown, and the consequent risk of organ failure in the recipient cannot be quantified. Because of the scarcity of available organs and the fact that all preretrieval parameters were excellent, we decided to evaluate the lungs with EVLP. In this case, EVLP assessment of lung viability was satisfactory despite a potentially detrimental incident during retrieval, and

the lungs were successfully transplanted. Possible explanations for the successful outcome include (1) inaccurate monitoring, with a low actual flushing pressure (unlikely); (2) incision of the left atrial appendage facilitates unobstructed drainage of perfusate, limiting the effect of hypertension in the pulmonary vascular bed; (3) the physiologic insult of very brief high flushing pressures is minimal; and (4) EVLP mitigated the insult and optimized the lungs for transplantation. EVLP can cost roughly £1500 to £2000 onward (costs may vary by center and country); however, there is some evidence that that lungs initially rejected for donation because of impaired function can be improved during EVLP and eventually transplanted without compromising early clinical results.⁵

CONCLUSIONS

High-pressure pulmonoplegia may not adversely impact donor lungs sufficiently to preclude transplantation. Our patient continues to do well 8 months postoperatively, pending longer-term follow-up. EVLP may possibly help to evaluate the transplant potential of donor lungs in doubtful cases.

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Cardiac allograft failure: Retransplant or long-term ventricular assist device?

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In determining treatment for cardiac allograft failure, one consideration is that outcomes after cardiac retransplants have been reported to be inferior to those observed after primary transplants.¹ In addition, the ethical dimension of the issue makes it difficult to reach a complete consensus. We report implantation of a left ventricular assist device for long-term support in a patient with cardiac allograft failure caused by coronary allograft vasculopathy.

CLINICAL SUMMARY

A 37-year-old man with viral cardiomyopathy caused by parvovirus B19 infection underwent heart transplant in June 2008. The posttransplant course was uncomplicated. Acute rejection was excluded in regular echocardiographic studies; however, coronary allograft vasculopathy was diagnosed on coronary angiography 1 year after heart transplantation. In October 2012, the patient was seen in New York Heart Association functional class III with general fatigue and cough. He had independently stopped taking the immunosuppressive agent 7 days earlier. Echocardiography showed a left ventricular ejection fraction of 35% and an end-diastolic diameter of 52 mm with severe diastolic dysfunction. Despite low-grade cellular rejection (International Society for Heart and Lung Transplantation grade 1B) and lack of evidence of antibody-mediated rejection in the endomyocardial biopsy, antithymocyte globulin, pulsed corticosteroids, and immunoglobulin were intensively administered, and plasmapheresis was performed during the following 3 months because of the severity of the echocardiographic findings combined with positive donor-specific anti-HLA class II. After conventional antirejection therapy failed, rituximab and bortezomib were given; however, the patient could not be completely weaned from inotropic support. The right ventricle was not dilated and had a moderately impaired ejection fraction of 40%. Tricuspid regurgitation was trivial.

After intensive discussion, our ethics and transplantation committees ruled against the possibility of the patient receiving a second heart transplant.

In April 2013, urgent left ventricular assist device implantation was performed with cardiopulmonary bypass through the groin vessels. The heart was approached through a left lateral thoracotomy in the sixth intercostal space. A HeartWare HVAD (HeartWare International, Inc, Framingham, Mass) was implanted by a method described previously² with outflow graft connection to the descending aorta. The postoperative course was uneventful, with stable right ventricular function. The patient was discharged home on postoperative day 46. Six months have passed since the operation, and the patient is doing well at home. He continues his immunosuppressive regimen and receives anticoagulation according to our institutional protocol.³

DISCUSSION

The decline in organ donations is a matter of social and political concern. In the past 2 decades, various approaches involving new legislation designed to increase the rate of organ donation have been adopted; however, heart donation has not notably increased.⁴ In this era of organ shortage, a noncompliant patient would naturally be removed from consideration for cardiac retransplant, and a chance for survival and later relisting should be granted only after reeducation has been successfully accomplished. On the other hand, mechanical circulatory support intended as a bridge to cardiac retransplant has been reported to resolve hemodynamic instability related posttransplant allograft failure, although it does not always contribute to a significant improvement in clinical outcome after cardiac retransplant.⁵ Under these circumstances, VAD implantation as long-term therapy rather than cardiac retransplant seems to be an acceptable option for a limited group of patients who are not willing to undergo a second heart transplant or are not adherent to their medication regimen, although concerns about anticoagulation and risk of infection remain.

Because of the advances being made in ventricular assist device technology and the increasing durability of these devices, it may not be long before ventricular assist devices are implanted on a regular basis as destination therapy rather than undertaking cardiac retransplant. We hope to follow up our patient carefully to evaluate the validity of our decision.

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