of small vegetations (<3 mm), recent embolization, nonoscillating or atypically located vegetations, or difficult to identify IE lesions in the setting of preexisting cardiac lesions (mitral prolapse, prosthetic valves, intracardiac devices, degenerative or sclerotic valves).³ Although the combination of negative TTE and TEE study results provides a 95% negative predictive value, such results do not definitively rule out vegetative IE.⁴ Current guidelines recommend repeating TEE imaging in 7 to 10 days if clinical suspicion remains high in the setting of an initial negative echocardiographic interpretation.^{1,2} In this report, an aggressive valvular infection with local tissue destruction developed within only 7 days. With a growing body of evidence supporting early surgical intervention in IE,⁵ this case provides a strong justification for repeating

echocardiographic imaging, because earlier identification of the severity of infection might have prompted earlier surgical intervention and potentially yielded an improved surgical outcome.

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Ex vivo lung perfusion to evaluate donor lungs after high-pressure pulmonoplegia

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Shortage of organ donors results in significant mortality among patients on transplant waiting lists, necessitating thorough evaluation before declining potentially transplantable organs. We report a case in which donor lung pulmonoplegia was accidentally delivered under high pressure. Despite a potential risk from elevated flushing pressures, the lungs were successfully transplanted after assessment with ex vivo lung perfusion (EVLP).^{1,2}

CLINICAL SUMMARY

Lungs from a 35-year-old female multiorgan donor with brainstem death after intracranial hemorrhage were provisionally accepted for a 52-year-old male patient with pulmonary fibrosis who was on our waiting list. Blood gas values at the time of organ offer showed a ratio of Pao₂ to inspired oxygen fraction greater than 300; all other parameters were acceptable.

Organ retrieval entailed median sternotomy and satisfactory on-table assessment, including pulmonary vein gas values. After bicaval ligation and aortic clamping, the right atrium and left atrial appendage were incised for venting while the lungs were flushed with 50-mL/kg cold Perfadex solution (Vitrolife AB, Göteborg, Sweden). Inadvertently, the pulmonary artery was perfused at very high pressures (pressure gauge reading >150 mm Hg), and the error was noticed only after 2 to 3 minutes (almost all pulmonoplegia delivered). Because of the possibility of alveolocapillary damage in the pulmonary vascular bed, it was decided not to transplant the lungs directly; rather, the donor lungs were evaluated with EVLP to assess suitability for implantation.

After returning to our center, the organs were transferred to the XVIVO Organ Chamber (Vitrolife) and assessed during ex vivo perfusion with STEEN solution (Vitrolife) as described elsewhere.¹ Briefly, the procedure entails cannulation of the left atrial cuff and main pulmonary artery, tracheal intubation, and ex vivo perfusion with an acellular perfusate under controlled temperature, pressure, and ventilation parameters to mimic physiologic conditions. Both at the beginning and after completion of EVLP, functional parameters such as oxygenation difference (pulmonary vein Po₂ – pulmonary artery Po₂), pulmonary vascular resistance, dynamic lung compliance, and airway pressures were found to be acceptable. Consequently, the lungs were deemed to be suitable for transplantation and implanted with

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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.