TABLE 1. Hemodynamic data before and 15 minutes after start of iloprost inhalation

	Before iloprost	After iloprost	Change		<i>P</i> value*
			Mean $\pm$ SD	%	
Mean pulmonary arterial pressure (mm Hg)	31.6 $\pm$ 6.6	26.1 $\pm$ 3.1	5.5 $\pm$ 5.5	−17.4	.01
Mean arterial pressure (mm Hg)	71.6 $\pm$ 9.7	70.8 $\pm$ 12.6	0.8 $\pm$ 13.2	−1.1	NS
Cardiac index (L $\cdot$ min ^{−1} $\cdot$ m ^{−2})	3.0 $\pm$ 0.5	3.2 $\pm$ 0.7	0.2 $\pm$ 0.5	+7.4	NS
Pulmonary vascular resistance (dyne $\cdot$ s $\cdot$ cm ^{−5})	394.3 $\pm$ 128.1	289.6 $\pm$ 94.6	104.7 $\pm$ 73.8	−26.6	.002
Systemic vascular resistance (dyne $\cdot$ s $\cdot$ cm ^{−5})	1016.1 $\pm$ 228.2	976.0 $\pm$ 332.1	12.7 $\pm$ 253.8	−1.2	NS

All data are mean $\pm$ SD. NS, Not significant.

*By paired *t* test.

tacyclin <3 minutes vs 20–30 minutes for iloprost). Aerosolized iloprost has shown vasodilating potency similar to that of inhaled NO in secondary PHT, and it actually appears to be superior in primary PHT.²

The intraoperative use of aerosolized prostanoids has been reported in only a few surgical cases,³ probably because of concerns regarding impaired platelet function. Both inhaled prostacyclin and NO are associated with impaired platelet aggregation in vitro^{4,5} but are without signs of platelet dysfunction in vivo.⁴ Increases in mediastinal drainage or transfusion requirements were not observed in any of our cases.

In conclusion, the intraoperative use of aerosolized iloprost is a clinical alternative to NO that warrants further comparative studies.

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Refractory chylothorax after lung transplantation for lymphangioleiomyomatosis successfully cured with instillation of povidone

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Chylothorax is a well-known complication after lung transplantation for lymphangioleiomyomatosis. Standard therapeutic options, including dietary regimens containing medium-chain triglycerides, chest tube drainage, and thoracic duct ligation have previously been reported as successful in managing chylothorax in lung transplant recipients with lymphangioleiomyomatosis.^{1,2}

We report a patient with refractory chylothorax after bilateral lung transplantation for lymphangioleiomyomatosis that failed to respond to all conventional therapies. After a 7-month postoperative period of continuous chylous effusion, the injection of povidone (INN polyvidone) through the chest tube was able to stop the chylous effusion definitively and rapidly.

Figure 1. Computed tomographic scan before LT.

Clinical Summary

A 35-year-old woman with end-stage lymphangioleiomyomatosis was referred to our center for lung transplantation (LT). Lymphangioleiomyomatosis had been revealed 6 years before by bilateral pneumothoraces that required bilateral pleurodesis by videothoracoscopy. At admission, the patient was dyspneic at rest, requiring high-flow oxygen supplementation (12 L/min). Computed tomographic scan revealed large cysts (Figure 1). On May 21, 2000, bilateral LT was performed. During the operation, striking dilations of lymphatic vessels located on parietal pleura were observed.

At day 6, a chylothorax occurred on left side (triglyceride level = 740 mg/dL). Total parenteral nutrition had no effect on the daily amount of chylous effusion (>2000 mL/d; Figure 2). At day 24, lymphography revealed a 2-fold thoracic duct. At the level of the 10th vertebra, a left lymphopleural fistula was observed with contrast leakage into the left pleural space. The patient underwent at month 1 a left thoracotomy with a tying as a whole of the tissues between aorta, esophagus, and vertebra. After surgery, the amount of pleural fluid decreased to half, but a right chylous effusion occurred. At month 2, tying of the right thoracic duct was performed through a thoracotomy. The amount of pleural fluid on the right side decreased progressively, allowing the removal of the chest tube. Nevertheless, repeated needle aspirations were still necessary on the same side (about 500 mL every 10 days). In addition, mean left chylothorax output was still greater than 1500 mL/d, despite the maintenance of total parenteral nutrition. At month 3, repeated lymphography confirmed a persistent lymphopleural fistula on both sides. Because of the persistence of the left chylothorax, an attempt of surgical closure of the lymphopleural fistula by thoracotomy was carried out at month 3.5, associated with chemical pleurodesis with talc. Nevertheless, this procedure had no effect on the output of left chylous leakage. At month 4, somatostatin administration was added for 14 days without benefit. At month 7, the patient was still not discharged from hospital, and

the daily output of left chylous effusion was more than 2000 mL/d. At this time chemical pleurodesis with povidone iodine was attempted: 40 mL sterile saline solution and 20 mL povidone iodine 10% were injected through the left chest tube, which was then clamped for 1 hour and then reconnected to 30 cm H₂O suction. In the 12 hours after this procedure, the chylous pleural output stopped definitively, and the chest tube could be removed after 48 hours.

The patient could be discharged to home at month 10. Repeated computed tomographic scans displayed sequelae of moderate pleural effusions on both sides, and we observed no recurrence of the chylous effusion within 2 years of follow-up.

Discussion

Chylothorax is a well-known complication after single or bilateral LT for lymphangioleiomyomatosis. Among 34 lung transplant recipients with lymphangioleiomyomatosis, Boehler and colleagues¹ reported 3 cases of postoperative chylothorax. Chylous effusion resolved in all cases after thoracic duct ligation, thoracotomy associated with medium-chain triglyceride dietary regimen, or needle aspiration. In another series, postoperative chylous fistula was observed in 4 of 12 patients who underwent LT for lymphangioleiomyomatosis.² Favorable results were obtained in all cases after thoracic duct ligation or sclerosis.² We report here a case of chylothorax after bilateral LT that was unusual with respect to the massive output of pleural effusion and the long-term course. The large output could be explained by the extreme severity of lymphangioleiomyomatosis before LT.

As previously reported in other cases, the chylothorax was explained by a leakage of chylous fluid into the mediastinum from dilated and torn lymphatic vessels.¹ After a 7-month postoperative period of continuous chylous effusion despite all conventional therapies, the injection of povidone through the chest tube was the only way to stop definitively the chylous effusion.

There is no standardized treatment of chylous effusion because of its infrequent occurrence and various causes. Most authors agree that the first step should be a conservative management with medium-chain triglyceride dietary regimen or total parenteral nutrition in association with chest tube drainage.³ In case of failure of medical management, the thoracic duct can be ligated.³ For refractory chylothorax, three alternative procedures are generally considered: somatostatin administration, pleuroperitoneal shunt, and injection of sclerosing agent (eg, talc, fibrin glue) through the chest tube.^{3,4} Povidone iodine injection has never been described for the management of chylothorax. Nevertheless, povidone has been reported as effective in the cases of malignant pleural effusions.⁵ In our case we observed a dramatic efficiency of povidone within the first day after the injection. We hypothesize that povidone may have acted in inducing a true pleurodesis and also as a sclerosing agent on the abnormal lymphatic vessels. This latter hypothesis is suggested by the persistence of moderate stable chylous effusion on both sides in our patient.

In conclusion, our observations suggest that the simplicity of use and the absence of reported side effects with povidone could make it an effective therapy in cases of refractory chylothorax after LT for lymphangioleiomyomatosis.

Figure 2. Evolution of chylous effusion output after LT.

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Epstein-Barr virus–associated pulmonary leiomyosarcoma arising twenty-nine years after renal transplantation

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An increased incidence of several malignancies, the most common being lymphoma and carcinoma of the skin, is a well-recognized complication of chronic immunosuppression therapy. Smooth muscle tumors arising in recipients of solid organ transplants are rare, with only 14 cases reported in the English language literature. Epstein-Barr virus (EBV) infection has been implicated in the pathogenesis of these tumors because of diminished immune function due to immunosuppressive therapy. We report the case of a 61-year-old woman who had a leiomyosarcoma arising in a bronchus 29 years after renal transplantation. The presence of EBV was demonstrated in tumor tissue by in situ hybridization.