

Current Status of Lung Transplantation in Japan

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Almost four years have passed since the registration system for the lung transplant recipients by Japan Organ Transplant Network started in Japan. First lung transplantations were performed for two recipients as two single lung transplantations at two institutes separately on March 29, 2000. Since then, 10 recipients have received 2 bilateral and 8 single lung transplantations from 8 out of 18 brain dead donors to date. In these 18 donors, an unilateral lung was harvested from 4 donors and both lungs could be utilized in 4 donors. The rate of the utility of lungs from brain dead donors has been relatively high (8/18, 44%) in Japan, so far. In the latter, 4 donors from which both lungs were harvested, right and left lungs were shared by different recipients in 2, and were transplanted to single recipients in 2. Eight single lung transplantations were carried out for 4 patients with pulmonary lymphangio-leiomyomatosis (LAM) and 4 patients with idiopathic pulmonary fibrosis (IPF). The remaining 2 patients with primary pulmonary hypertension (PPH) underwent bilateral lung transplantations. Consequently, lung transplantation for three different types of pulmonary disease, i.e., airway, interstitial and vascular diseases, and all variations of surgical procedures have been already experienced to date. All patients have survived the perioperative period and 7 of them have already been discharged from the hospital, and 4 of 7 patients have recovered to their previous life styles. One patient who received a right lung transplant for IPF has died of aspergillus infection in the native left lung 13 months after transplantation.

Although lung transplantation in Japan has started with successful results so far, the donor shortage is becoming as serious in this country as in the U.S. and other advanced western countries. The number of registered patients for lung transplantation gradually increased until

2000, but it is recently accelerated perhaps due to many reports of successful outcomes of lung transplantation by mass media. To date, 83 patients have been registered, of whom 21 (25%) have already died on the list, 10 (12%) have undergone transplantation from a brain dead donor, 4 (5%) have undergone living lung lobar transplantation from relations, and 48 candidates are on the waiting list in February 2002. These conditions result in the gradual increase of the average waiting time. Because of the small possibility of lung transplantation from brain dead donor in this country, the number of patients who attempt living lung lobar transplantation from relations is increasing. In addition, lung transplantation from brain dead donors is actually impossible for small children, since organ donation from brain dead donor less than 15 years of age is not legally accepted in Japan. Consequently lung transplantation from living relations is the only one choice for saving the lives of small children especially with PPH at present.

Thirteen lung lobar transplantations from living relations have been carried out to date in Japan. Four of them were done after registration and the remaining 9 patients were transplanted without registering on the Japan Organ Transplant Network. Three patients were less than 15 years of age, that is to say, most cases were adults, although adult-to-child combination is ideal for this procedure from the standpoint of size matching. Transplantation of both right and left lower lobes from two donors was the most common procedure for these patients except one case who received only the right lower lobe from his mother. He was 10 years old and the big difference of body size between the donor and recipient enabled the exceptional procedure. The age distribution of recipients ranged from 10 to 53 years and the diseases of these 13 patients were 4 PPH, 3 IPF, 3 bronchiectasis, 2 bronchiolitis obliterans and 1 LAM. At present, all patients are alive 2 to 40 months after surgery except one who died perhaps due to rejection one and half year after transplantation. Ten of them have already returned to their previous work or school. As to donor conditions after surgery, no serious complications have been encountered so far.

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Although lung transplantation from both brain dead and living donors has started with successful results, there are still several problems to be solved in order to improve the lung transplantation system in Japan. First, lung transplantation is not yet covered by the health insurance system in Japan, and patients or the hospital must pay the cost at present. To reduce medical expenses of patients and to make this medical service equally available to every patient, this issue is quite urgent. Second, we already have coordinators for organ donation, however, we do not have coordinators for lung transplant candidates or recipients in our country. To improve the quality of life of patients from the standpoint of the management of mental problems during the long-term waiting period with a small chance for transplantation, coordinators for recipients are quite necessary. Third, the prognosis of patients with PPH or LAM on the waiting list is different from that of patients with IPF or infectious lung diseases. Since patients with PPH or LAM can survive longer due to the

development of new medical treatments or the slow progressive nature of the disease itself, the chance of lung transplantation for patients with IPF or infectious lung diseases is decreasing in the near future because of many PPH or LAM patients in the higher part of the waiting list. In order to improve this, earlier registration of these patients must be recommended to both attendant physicians and patients themselves. Finally, it may be necessary to increase the number of institutions for lung transplantation, since successful outcomes have been shown to be promising in our country from the past experiences. In Japan, 4 institutes (Tohoku University, Kyoto University, Osaka University and Okayama University) are allowed to perform lung transplantation from brain dead donors. In order to give more equal chances for patients who are not able to move easily due to severe respiratory failure, another 2 or 3 institutions for lung transplantation will be required in the near future to allocate candidates appropriately.