

# Living-Donor Segmental Lung Transplantation for Pediatric Patients

**Objective:** Living-donor lobar lung transplantation is a viable option for patients too ill to survive a long waiting time for cadaveric donors. Usually, the right and left lower lobes from 2 healthy donors are implanted in the recipient in place of whole right and left lungs. However, an adult lower lobe may be too big for a small pediatric patient. The aim of this study was to evaluate the outcome of living-donor segmental lung transplantation (LDSLT) for pediatric patients.

**Methods:** Between August 2009 and May 2021, we performed LDSLT in 6 critically ill pediatric patients including one patient on a ventilator and another patient on ECMO. There were 4 male and 2 female patients, with ages ranging from 4 to 15 years (average, 8.3 years). The recipient height ranged from 94.4 to 123 cm (average, 109.4 cm), and the weight ranged from 12.3 to 16.8 kg (average, 15.3 kg). The diagnoses included complications of allogeneic hematopoietic stem cell transplantation (n = 4) and pulmonary fibrosis (n = 2). Donors were 10 parents and one grandmother. All patients received bilateral lung transplantation under cardiopulmonary bypass. A basal segment and a lower lobe were implanted in three patients. A basal segment and a S6 segment were implanted in other three patients. In two patients, the right S6 segmental graft was rotated and implanted as the left lung (Figure). All data were analyzed retrospectively as of September 2021.

**Results:** Among the 9 segmental grafts implanted, 7 segmental grafts functioned well after reperfusion. Two rotated S6 segmental grafts became congestive; one required graft extraction and the other required venous repair which was successful. There was one hospital death (14 days) due to sepsis and one late death (9 years) due to leukoencephalopathy. The rest of four patients are currently alive. The 1 and 3-year survival was 83.3% (Figure). There was no complication related to segmentectomy in the donors.

**Conclusion:** LDSLT was a technically difficult but feasible procedure with acceptable outcome for small pediatric patients whose chest cavities were too small for adult lower lobe implantation.

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