Techniques and results of lobar lung transplantations

Delphine Mitilian *The Foch Lung Transplant Group, France*

For small adult recipients, the scarcity of suitable matching size donor increases the time on the waiting list. The use of lobar lung transplantation (LLT) affords an optimal strategy to overcome size mismatching between donor and recipient. We report the experience of 50 LLT at Hopital Foch during a 25 yr period. There were mainly young and small females with cystic fibrosis.The decision to perform a lobar reduction was based on the predicted donor/recipient TLC ratio and on the visual assessment of the chest wall cavity and of the size discrepancy at the time of surgery. The surgical approach was initially a clamshell incision and it was switched to bilateral antero-lateral thoracotomies sparing sternum. Our surgical strategy was to perform mostly middle and lower lobe with left lower LLT; left lung split transplantations were done in a few cases. 64% of patients required circulatory support with cardio-pulmonary by-pass or a peripheral veno-arterial ECMO.

Graft dissection and lobar reduction were performed in our hospital on the back table. On the donor, the right bronchus was sectionned at the origin of the intermediate bronchus. The left bronchus was transected at the level of the lobar division to perform the anastomosis far from the apical segmental bronchus. The pulmonary artery was transected after the mediastinal branches. On the right side, the vein from the upper lobe was transected but the whole atrial cuff was preserved. Furthermore, in 22% of our cases a pericardial cuff was made in order to widen the atrial cuff and preserve the venous flow from the middle lobe. On the left side, a large cuff was preserved around the inferior pulmonary vein. On the recipient, vascular pedicles were carefully left long to facilitate the anastomosis and the bronchi were transected at the level of the main bronchus. The first lobe was placed into the chest cavity in a way that anticipated its future position after inflation. The bronchial anastomosis was performed in an usual end-to-end fashion. The venous anastomosis was performed in most cases with the use of the whole atrial cuff to guarantee a wide lumen. Finally, the arterial tension-free anastomosis was performed followed by a gradual controled reperfusion while declamping.

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Primary graft dysfunction occurred in 54% of the patients and ten of them needed a prolonged veno-arterial ECMO. Ten patients had to be re-operated on. We observed a decreased in-hospital mortality since 2003. Airway complications leading to repeated rigid bronchoscopy occurred in eight patients. The mean FEV1 of the survivors was 66% at 5 years. The median survival of this series was 28 months and the 3- and 5- year survival rates were 60 and 46%, respectively.

In conclusion, LLT are a reliable surgical option to alleviate donor lung shortage and they can be performed with satisfactory functional results and long-term survival rate. Improvement of peri-operative management such as the use of epidural thoracic analgesia and ECMO, as well as technical modifications, have contributed to a better outcome.