Lobar lung transplantation: more than bits and pieces

Clemens Aigner*

Department of Thoracic Surgery, Medical University of Vienna, Vienna, Austria

* Corresponding author: Department of Thoracic Surgery, Medical University of Vienna, Waehringer Guertel 18-20, 1090 Vienna, Austria. Tel: +43-1-404005620; fax: +43-1-404005640; e-mail: clemens.aigner@meduniwien.ac.at (C. Aigner).

Keywords: Donor-recipient size mismatch • Lobar lung transplantation • Thoracic epidural analgesia • Extracorporeal membrane oxygenation

Lobar lung transplantation has evolved as an important method to reduce donor organ shortage for paediatric and small adult recipients who would otherwise not receive a suitable donor organ in due time. Furthermore, it allows the use of unexpectedly large donor organs as well as the utilization of lungs with a localized pathology in one lobe. This report from the Foch group [1] represents one of the largest series of lobar lung transplantation with a detailed long-term follow-up and an analysis of the evolution of the technical steps required to perform this procedure. Six patients in this report have been transplanted with the split lung technique, which represents the most efficient method of organ utilization. Only a few centres worldwide have accumulated a large experience with lobar lung transplantation from brain dead donors [2–5]. However, compared with the overall number of lung transplantations performed annually, lobar transplantation still accounts only for a small percentage.

Technically, lobar lung transplantation is more challenging than standard lung transplantation, and recipients are typically younger and smaller than standard lung recipients and represent, in the current report, mainly patients with cystic fibrosis (CF) and pulmonary fibrosis. The important technical aspects of lobar lung transplantation are clearly outlined in the paper. The perioperative management in lung transplantation has significantly evolved over the long observation period reported in the study.

A relatively high number of transplants in the early phase of the observation period were performed without the use of either cardiopulmonary bypass or extracorporeal membrane oxygenation. Since there was no significant difference in the development of primary graft dysfunction (PGD) in the various groups, there is no clear answer whether a reduction of the relatively high PGD incidence could have been achieved by adopting a routine use earlier. An important fact that has to be kept in mind is that the vascular bed of a single lobe is usually not sufficient to take up the entire cardiac output without developing reperfusion oedema; therefore, in our centre, lobar transplantation is nowadays routinely performed with the help of extracorporeal support.

The authors report—except for the cases of split lung transplantation—exclusively on the use of lower lobes as their standardized technique for performing lobar transplantation. However, the use of upper lobes might have some distinct advantages in specific situations. The basis of the lower lobe can be very broad and, particularly on the left side in patients with a hypertrophic heart, the upper lobe frequently fits the anatomical situation of the chest cavity much better.

Size matching is of crucial importance in lobar transplantation. The actual chest configuration of the donor and recipient has to be taken into account, as well as the real recipient total lung capacity (TLC), which can vary substantially from the predicted TLC. A correction factor of 10–20% compared with the predicted recipient TLC for upsizing CF patients and downsizing patients with pulmonary fibrosis is utilized by the authors. This will certainly serve as a gross estimation; however, the use of a real recipient TLC obtained by body pletysmography is certainly desirable to be able to make the most accurate judgement possible [6]. Original-sized chest X-rays in a posterior–anterior and lateral view have also proven to be helpful in estimating the size match at the donor hospital. The final choice of which lobes are used is usually taken directly at the transplant procedure as mentioned by the authors.

The bronchial anastomosis in lobar transplantation is more delicate to suture since usually a size mismatch has to be corrected. The rate of bronchial complications varies among reports on lobar lung transplantation. The anastomotical technique used by the Foch group is a widespread method that, however, is still associated with a substantial rate of anastomotic problems. Satisfying results can, in our experience, also be achieved with a single running suture technique [7].
In summary, this report is an important contribution to the literature on lobar lung transplantation, highlighting the importance of this approach for paediatric and small adult recipients.

REFERENCES


