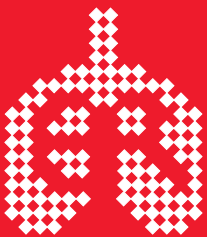


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Lung Transplantation

Edited by
J. Boe, M. Estenne, W. Weder



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Lung Transplantation

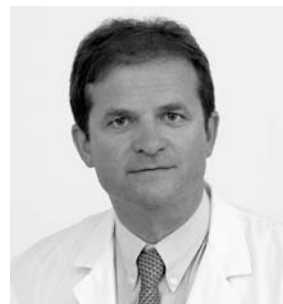
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Preface

Since the first attempt at human lung transplantation (LTx) by Hardy in the early 1960s, LTx has become an established treatment for a wide variety of end-stage cardiopulmonary diseases. Initially limited to patients with primary pulmonary hypertension or Eisenmenger's complex, this procedure was extended to patients with a variety of end-stage pulmonary disorders, such as end-stage fibrotic lung disease and end-stage obstructive lung disease as well as suppurative lung disorders, such as bronchiectasis or cystic fibrosis. Problems with bronchial anastomotic healing in the immediate postoperative period beleaguered single LTx, but adaptations in surgical approach and the elimination of steroids in the immediate postoperative period led to the successful single LTx for interstitial lung disease in 1983. Subsequently, bilateral LTx was developed, as well as sequential bilateral procedures, with considerable success. A successful LTx is the culmination of a complex and costly series of surgical, medical and social interventions aimed at both prolonging life and enhancing quality of life for the patient with end-stage disease. These rapid advances in patient care could not be possible without the dramatic advances in the understanding of the immune response and the new development of immunological management following transplantation.

Better understanding of the mechanisms of ischaemia/reperfusion injury as well as improvements in the techniques of lung preservation have contributed to a reduction in the incidence of ischaemia/reperfusion-induced lung injury and the development of primary graft failure after LTx. A future challenge will be to improve the number of donor lungs available for transplantation, since improvement in the quality of donor lungs can have a tremendous impact on the number of transplants performed and on the success of LTx. Indeed, so long as the lack of suitable lung donors remains a significant problem, LTx will be limited to a minority of patients with end-stage lung disease.

This issue of the *European Respiratory Monograph* offers the reader excellent state-of-the-art information regarding experiences with LTx four decades after the first procedure. Increased physician awareness of LTx by discussion of the possibilities of organ donation, especially in the critical care setting, may also help to offer new perspectives for those patients suffering from otherwise fatal lung pathologies.

E.F.M. Wouters
Editor in Chief

INTRODUCTION

J. Boe, M. Estenne, W. Weder

Major advances have been achieved since the first successful lung transplantation (LTx) performed two decades ago, such that the procedure has now gained widespread acceptance as a therapeutic option for patients with severe functional impairment and limited life expectancy. This monograph will review in detail the current status of all aspects of clinical LTx.

Since the early 1980s, when LTx was only proposed to patients with pulmonary vascular diseases, there has been a considerable expansion of the spectrum of diseases for which transplantation can be offered. In addition, some recipient characteristics that were previously regarded as absolute contraindications are now considered acceptable. These factors have resulted in a rapid growth of the number of potential candidates that has not been paralleled by an increase in the number of donor lungs, leading to a levelling off of the annual LTx rate, a doubling of the median waiting time and an increase in the number of candidates who die while awaiting transplantation. As a result, the procedures of patient selection, referral, and listing have evolved. Waiting list mortality may be decreased by an aggressive management of patients with advanced lung diseases, including the use of new medical treatments, such as vasodilator therapy for pulmonary artery hypertension. In addition, efforts to increase the proportion of donor lungs that will eventually be transplanted are of the utmost importance. Such efforts include optimisation of allocation policies, improved management of lung donors, the use of "marginal" donors, of lobar transplantation from living or cadaveric donors, and of organs from nonheart-beating donors. In the future, xenotransplantation may also offer a solution to the current shortage of donor organs.

The last 20 yrs have witnessed substantial improvements in the preservation of the lung allograft and in surgical techniques, which now include heart-, single-, sequential bilateral- and lobar LTx. Remarkably, there has been a dramatic reduction in the incidence of bronchial anastomotic complications. The perioperative management of patients has been standardised and refined. Over the last few years, new immunosuppressive agents have become available, and have been used in the induction and maintenance regimen of lung transplant recipients. However, the benefits that these novel agents have procured in terms of prevention of acute and chronic rejection after renal and liver transplantation have not yet been demonstrated in the setting of LTx. In fact, chronic allograft rejection manifested histologically as bronchiolitis obliterans remains the major hurdle to long-term survival; its pathogenesis is only partially elucidated and its prevention and treatment are still disappointing. Yet, progress in the prevention and/or management of infectious and noninfectious complications have resulted in improved outcomes, with an increasing proportion of patients surviving beyond 5 yrs and reporting dramatic changes in quality of life. This favourable trend is also seen in the paediatric population.

This monograph discusses the marked physiological alterations associated with LTx, their impact on pulmonary function (and cardiac function in recipients of heart-lung grafts) and on exercise capacity, as well as the future of LTx.

LTx has reached its current clinical plateau largely through refinements in the selection of patients, operative techniques and postoperative care. Future developments in immunosuppressive therapy and ongoing research efforts into the immunobiology of

INTRODUCTION

bronchiolitis obliterans will hopefully further improve long-term outcome, making LTx fulfil its potential as an effective and enduring treatment option for patients with advanced lung diseases.