

Long-term survival: Achilles heel of lung transplantation

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Abstract

long-term survival after lung transplantation has increased over recent years, but still fall short of providing extensive life expectancy for more than 10 years.

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Lung transplantation is a well-established procedure for patients with end-stage lung disease. It improves survival and quality of life of transplant recipients. Still the intervention remains, in some sense, sort of exchanging one disease with another less morbid disease because of the potential undesirable consequences that comes with it. Most importantly the long-term survival following lung transplantation is considerably low compared to an otherwise healthy age matched individual. Patients who identified as a potential candidate for this procedure usually have an expected median survival of less than two years due to advanced and progressive lung disease and respiratory failure. Median survival after lung transplantation is about 6 years. Recipients typically obtain a significant improvement in the quality of life due to improvement in respiratory function, elimination of oxygen requirement and alleviation of dyspnea. After a period of recovery post-procedure, recipients have a high probability of returning to normal functional capacity. The intensity of post-transplant clinical, laboratory, and radiographic surveillance and adverse effects of transplant medications could contribute to some impairment in quality of life. However, the most striking aspect is the lack of robust long-term survival benefit with lung transplantation.

In this issue of the journal, Iguidbashian and coworkers quantified this glaring deficiency by comparing the 10-year survival of lung transplant recipients with matched controls from general population. There is a 53% absolute difference in the 10-year-survival between the 2 groups. Transplant recipients in the study cohort have a 10-year survival rate of 28%. Globally, lung transplant survival demonstrates a clear ‘era effect’ phenomenon characterized by a gradual improvement in the immediate and long-term survival over the years[1]. Most striking progress has been noted in the one-year survival. In 1990, the reported one-year survival was as low as 45%, whereas it is around 90% in recent cohorts[2]. Typically, the risk of death is highest in the first year after surgery due to complications associated with surgery and infection. However, with progressive improvement in surgical techniques, pre-operative recipient optimization, and advancements in the critical care, the immediate survival has improved drastically.

These improvements are also reflected in improved long-term survival in recent years. Fakhro and coworkers have reported a 30% 20-year survival in their cohort [3]. The study cohort presented here by Iguidbashian and coworkers includes patients between 1990-2007, which is a major limitation that needs to be taken into consideration while interpreting the findings. Hopefully, long-term survival will continue to increase as progress in lung transplantation is made.

Chronic lung allograft dysfunction is the most common cause of death among transplant recipients[4]. Mechanistic underpinnings of CLAD pathogenesis are still unclear, and it has majorly been a deterministic process once it begins. Malignancy and infection are two other major causes of death in transplant recipients. To successfully conduct lung transplant surgeries and deliver optimal follow up care, it requires an organization of things including trained specialists, robust protocols, and personalized care before and after surgery. Diligent preventive care can avert premature death or complications related to rejection, infection and malignancy. Analysis of survival data from registry could muddle the picture and present a less than optimal outcomes. Data from robust single-center experience could more accurately reflect the expected survival of lung transplant recipients.

Lung transplantation greatly improves quality of life. It's effect on longevity continues to be limited. This needs to be addressed when presenting the option of transplant to patients and their families who have to deal with advanced lung failure. This therapy can in some cases provide long-term success, but we have to discuss openly the fact, that in most patients, life expectancy after transplant will be less than 10 years. This becomes particularly important when one looks at pediatric lung transplantation: here the benefits that the procedure can offer are clearly limited, chances of reaching adulthood and finishing school continue to be rather small. Families need to understand that before they make the commitment to dedicate emotional and financial resources to save their sick child. Very difficult and complex discussions cannot be avoided and will put significant stress on patients, families, and health care providers.

At the same time, while we acknowledge the present limitations of lung transplantation, we have to keep working hard to improve outcomes and understand the mechanisms leading to graft loss in the mid- and long term. Why do some patients live several decades with the transplanted lungs? Why do they seem to develop significant degrees of tolerance to the new organ?

Iguidbashian and coworkers remind us how much progress has been made. Their paper also reminds us how much more work has to be done to make lung transplantation a truly long-lasting solution for patients with advanced lung disease.

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