

# EDITORIAL COMMENT

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## The Brazilian Lung Transplant Experience: Reflections and Parallels

The first human lung transplantation was performed on June 11, 1963 at the University Hospital, in Jackson, Mississippi by James D Hardy and the patient died 18 days later.<sup>1</sup>

Before the introduction of cyclosporine, attempts at lung transplantation failed due to rejection, high infection rates and bronchial complications.

On November 7, 1983, Dr. Joel Cooper and his team, in Toronto, achieved the first long-term survival after a single-lung transplant for fibrosis using a cyclosporine-based regimen.<sup>1</sup>

A double-lung transplantation was subsequently performed, on November 26, 1986, in a 42-year-old patient with end-stage emphysema.<sup>1</sup>

Upon reading Professor Roger Normando's text, about the history of lung transplant in Brazil, I identified several coincidences and parallels with the experience in lung transplantation at the national level and also in other teams worldwide.

José Camargo will remain in our memories as the pioneer of lung transplantation in Brazil and the first to perform a living-donor lobar lung transplant, outside the United States of America.

We had the opportunity to meet José Camargo in person, from whom we received countless pieces of advice and teachings. In addition to meeting him at various conferences and scientific meetings, we had the honour of welcoming him to Santa Marta Hospital, where he gave us a masterful lecture on all aspects of lung transplantation.

In Portugal, the first transplant involving lungs was a cardiopulmonary transplant performed at Santa Marta Hospital

on April 17, 1991, by Rui Bento, who was both a surgeon and the director of the service.

In 2000, several members of our team completed an internship in the Thoracic Surgery department at Puerta de Hierro Hospital in Madrid, promoted by the director of our department, José Roquette. Since the start of our activity on lung transplantation, the Thoracic Surgery Department at Puerta de Hierro Hospital has always been our mentor and partner.

The first single-lung transplant in Portugal was performed by Henrique Vaz Velho on June 1, 2001, followed by the first double lung transplant in 2002.

As described in this article by our Brazilian colleagues, we have experienced both good and bad times. We suffered a devastating defeat in the first transplant and, in the second, the unforgettable joy of victory. We had been warned in advance by our Spanish colleagues about this possibility, given the complexity of this procedure. However, the seventh patient to receive a transplant is still alive, 22 years after the operation.

The number of cases per year was initially low as the Brazilian experienced in the beginning. Initially, the very conservative selection of teams tends to be more rigorous in the selection of donors and recipients, which reduces the number of surgeries and delays the accumulation of experience. The technical learning curve is around 20 to 25 cases per year, which is an important goal to achieve.

For example, when analysing the overall statistics for lung transplants in Spain, which is one of the best organised programmes in the world, we find that in the 1990s they

performed only between 0.2 and 2 transplants per million inhabitants. Currently, they perform more than 12 transplants per million inhabitants, with a total of 623 transplants in 2024.<sup>4</sup>

Lung transplantation is considered one of the most complex surgical procedures due to the inherent fragility of the organ to the risks of infection, surgical complexity and high rates of acute and chronic rejection.

Lung transplantation needs a multidisciplinary team that constantly interacts – that is to say, needs a true interdisciplinary team, comprising surgeons, pulmonologists, bronchology interventionists, anaesthesiologists, infectious diseases specialists, nutrition and psychology specialists, perfusion technicians, nurses, physiotherapists and image specialists. Unlike other surgical endeavours, lung transplantation is an imperative teamwork.<sup>2</sup>

In 2007, José Fragata was appointed head of the service and reorganised the team, promoting interdisciplinarity and multidisciplinary. I would highlight several improvements.

The pulmonology team has been strengthened, notably with the addition of Luísa Semedo, after her internship at Puerta del Hierro Hospital.

The implementation of extended-criteria donors for lung transplantation, using marginal criteria, has allowed an increase in the organ pool.

I carried out some experimental work on the technique of harvesting and preparing the graft on the table, before implanting a single lung lobe on each side of the thorax. After that, the first unilateral lobar lung transplant was performed by the team in 2011 and then the first bilateral lobar lung transplant in 2012. Both patients are currently alive. The second patient has since undergone a lung retransplant in 2025, due to chronic rejection.

The first transplant performed with ECMO support took place in 2012, which reduced the negative impact of extracorporeal circulation on patients.

With the gradual increase in the number of transplants performed and the quality of the results obtained, this clinical practice has gained credibility within the national medical community. Over the last decade, the number of lung transplants performed annually has increased significantly, with the addition of new members to the medical team and the thoracic surgery team, now led by Paulo Calvino. I would highlight the first lung retransplant in 2018, as well as the first multi-organ transplant, involving the implantation of a lung and kidney in the same anaesthetic procedure. The recovery of lungs previously deemed unsuitable for transplantation using ex-vivo technology was performed for the first time in 2019, allowing for an increase in the number of viable organs for transplantation.

Recent scientific evidence has shown that cold ischaemia time can be extended to more than 12 hours when lungs are stored at a temperature of 10°C. In 2025, this was implemented, which has made it possible to postpone lung transplants until the following day, reducing fatigue for the team.<sup>3</sup>

In 2025, forty-six lung transplants were performed at Santa Marta Hospital in Lisbon, representing the busiest year since the programme began. A total of 485 transplants have been performed to date, with this team remaining the only one to perform this procedure in Portugal.

## REFERENCES

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