50k Corneal Transplants

This month, L V Prasad Eye Institute achieved a significant milestone when we touched the mark of performing 50,000th corneal transplant at our Institute. It is possibly the highest number ever by a single organisation/Institute anywhere in the world. We are excited that this happened in India, where everyone was sceptical of an organ donation and transplantation programme. This, in a country where corneal blindness is the second largest cause of blindness after cataract in those above 50 and number one cause in those younger carries a lot of meaning. To be able to offer them an immediate transplant and to do our best to restore and preserve sight is a blessing. This month we counted thousands of those blessings and have found a cause to celebrate them.

I remember the fateful day when I received a call from US; it was my junior from medical school in Rajasthan. He had heard me speak about LVPEI's eye banking success story on Radio USA and sought my help for his mother. The lady lived in Ajmer, Rajasthan, and had severe vision loss for many years. A cornea transplant was performed on one of her eyes nearly two decades ago, but the graft had failed. The family lost all hopes and accepted her fate.
When I examined her, she was blind in one eye while the other eye was amenable to correction. She had an inherited corneal disorder called "macular corneal dystrophy" for which the outcomes of a transplant are very good. While the patient and her husband were apprehensive, I could convince her to undergo the transplant.

The surgery was a success! Her family erupted with joy—she could see after 25 years--and the lady was awash with emotions. She could now see her adolescent grandchildren--she had no idea what they looked like. Later, she also got to travel to USA to spend time with her doctor son. But there was more: I ended up transplanting corneas on to 7 members of the family – 3 women, 2 men—who can all see now. This family of shopkeepers from Ajmer and Udaipur now have a new lease of life.

Corneal blindness

Corneal opacity is one of the leading causes of vision loss and blindness in India and most countries in the developing world. There are many causes including malnutrition in children with Vitamin A deficiency, trachoma, other infections of eye, developmental anomalies, inherited eye diseases, and poorly performed cataract surgery.

India is a country with the world's largest population and possibly the highest number of corneally blind people. For now, the only hope for sight restoration for them is a corneal transplant. Transplants, however, are not simple and are fraught with challenges on multiple fronts. These include a shortage of good quality donor corneas because of poor eye banking, acute lack of trained cornea transplant surgeons, and even inadequate knowledge among ophthalmologists to provide post-surgery follow up care. Therefore, a large number of patients have to depend on a limited pool of cornea specialists, have to wait for long periods for their turn at a transplant, and--the worst—they have to struggle for follow-up care, without which they are susceptible to graft

failure and consequently, a retreat back to blindness. This was exactly my patient's fate and that of many transplant recipients like her.

At LVPEI the cornea transplantation program was started to systematically address all these shortcomings.

The current status and the way forward

Our cornea program addresses the whole problem of cornea blindness on multiple fronts. We set up a model eye banking network with a focus on quality and volumes. I am proud of the fact that eye banks associated with LVPEI have harvested over 120,000 corneas in these past 35 years - the largest volume in the Asia-Pacific region--and are able to harvest more than 12,000 corneas a year currently. Today, no patient has to wait for the availability of corneal tissue in the three states where we are present. In these 37-odd years, over 60% of our transplant patients were male, a situation that is bound to change. Another wave of change is the type of transplant: we are moving away from full thickness transplants (over 60%) towards partial thickness transplants and cell-based therapy which offer better outcomes.

We host a variety of training programs for corneal surgeons (to build a pool of well-trained corneal surgeons), comprehensive ophthalmologists (in follow up care), contact lens practitioners and all cadre of eye bank personnel.

Our team has started addressing the problem of follow up care by sending reminders to patients, as well as strengthening telehealth and home-bound care. We are working on machine learning tools to predict graft or compliance failure risks in patients coming to us with corneal opacity. We are helping other organisations set up eye banks where no such facility exists. Our research team is working on building a 3D printed artificial cornea and cell bank, all towards eliminating the shortage of donor corneal tissues.

We still have a long way to go. We will strengthen the whole cornea program in an holistic manner, by reducing the number of preventable cases, improving care of treatable causes, ensuring availability of corneal tissues in every part of our country, further strengthening the pool of corneal surgeons and building the base for excellent follow up care. I hope to see a system that would one day usher India in to the category of nations where corneal opacity and blindness will no longer be an important cause of vision loss.

This milestone is an opportunity for me to thank all our cornea donor families and the recipients who put a lot of trust in us. Many supporters from diverse fields shared with us their **time**, **talent** and **treasure** to make this journey possible. It is with optimism and hope that I request all of them to continue to do so, after all, to quote a Haitian proverb: "beyond mountains, more mountains."

-Prashant Garg