



Pioneering Corneal Harvest in Eastern Nepal: A Case Report

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Abstract

Corneal blindness is a significant global health issue, particularly in developing countries like Nepal, where limited access to eye care and cultural barriers hinder corneal donation and transplantation efforts. While the Tilganga Institute of Ophthalmology has played a pivotal role in advancing corneal transplant techniques, the demand for corneal tissues still far exceeds the supply. Cultural beliefs and misconceptions about organ donation pose challenges, but initiatives focused on education, community engagement, and the establishment of local eye banks are crucial for addressing these issues. Recent successful post-mortem corneal harvests in eastern Nepal highlight the potential for expanding organ donation practices and improving access to corneal transplants, ultimately enhancing the quality of life for those affected by corneal blindness. This case report highlights the successful retrieval of corneas post-mortem in Eastern Nepal, detailing the entire procedure, challenges encountered, coordination with hospitals and families, and the management of logistics involved.

Keywords: Corneal Transplant; Organ Donation; Community Awareness; Cultural Engagement; Eye Care

Key Clinical Message

The successful corneal harvest marks a significant advancement in organ donation in eastern Nepal, highlighting the importance of community awareness and cultural engagement. This milestone emphasizes the potential of corneal transplants to restore sight and transform lives.

Introduction

Corneal blindness is a major public health issue worldwide, affecting millions of individuals and significantly impacting their quality of life. The World Health Organization estimates that corneal opacities are responsible for about 4.4% of global blindness, with a higher prevalence in developing countries, where access to eye care services is often limited [1]. Corneal transplantation,

a surgical procedure that replaces a damaged or diseased cornea with a healthy one from a donor, offers a viable solution to restore sight in affected individuals. However, the demand for corneal tissues far exceeds the available supply, particularly in regions like eastern Nepal, where awareness of organ donation remains low [2].

In Nepal, the journey toward effective corneal transplantation has evolved over the past few decades. The Tilganga Institute of Ophthalmology, established in the early 1990s, has been instrumental in pioneering corneal transplant techniques and promoting eye care services across the country. Under the leadership of Dr. Sanduk Ruit, this institute has performed thousands of successful corneal transplants, establishing Nepal as a regional hub for eye care [3]. Despite these advancements, the national eye bank system

struggles with the consistent collection of corneal tissues due to cultural, religious, and economic barriers [4].

Cultural beliefs significantly influence attitudes toward organ donation in Nepal. Many communities hold traditional views regarding the preservation of the body after death, which can create resistance to the idea of organ donation [5]. However, certain communities, such as the Jains, promote the values of compassion and charity, often supporting organ donation initiatives. Engaging with these communities is crucial for increasing awareness and acceptance of corneal donation as a means of helping those in need [6].

Recent initiatives in eastern Nepal have aimed to enhance awareness around organ and corneal donation. Educational campaigns, community workshops, and collaborations with local leaders are essential strategies to dispel myths and foster a culture of donation. Addressing misconceptions surrounding organ donation can lead to an increase in donor registrations and ultimately improve the availability of corneal tissues for transplantation [7].

Moreover, the establishment of local eye banks can facilitate timely harvesting and preservation of corneal tissues, ensuring that donated organs reach recipients in optimal condition [8]. These eye banks play a critical role in coordinating the logistics of organ donation, from obtaining consent to managing the transportation of harvested corneas. However, expanding this infrastructure is vital for addressing the needs of rural and underserved populations who often lack access to such resources [9].

In light of these challenges, the recent successful post-mortem corneal harvest at a teaching hospital in eastern Nepal represents a significant milestone in the region's ophthalmological care. This event not only showcases the potential for expanding organ donation practices but also underscores the importance of community involvement in promoting eye health initiatives. By fostering a culture of compassion and charity, healthcare professionals can encourage more families to consider organ donation, ultimately giving the gift of sight to those in need.

In summary, while Nepal has made notable progress in corneal transplantation, significant challenges remain. Through community engagement, education, and improved infrastructure, the gap between the demand and supply of corneal tissues can be bridged. This concerted effort is essential for advancing eye care services and improving the quality of life for individuals suffering from corneal blindness.

Case History/Examination

A 68-year-old male patient presented with a complex medical history that included chronic kidney disease (CKD) and acute anterior wall myocardial infarction (MI). He had been receiving Sustained Low-Efficiency Dialysis (SLED) as part of his ongoing treatment for CKD and was on a medication regimen that included Ecospirin, Clopidogrel, and Atorvastatin to manage his cardiovascular health.

Despite the medical interventions, the patient unfortunately succumbed to his cardiac condition in September 2024. His death prompted his family to consider organ donation, a decision influenced by their philosophy of compassion and charity. They believed that by donating the patient's corneas, they could provide others the gift of sight, aligning with their values of altruism and community service.

Methods

Upon admission, a thorough evaluation was conducted, leading to differential diagnoses that primarily included myocardial infarction, acute coronary syndrome, and heart failure exacerbated by chronic kidney disease. The confirmation of MI was achieved through a series of diagnostic tests. Elevated cardiac enzymes, particularly troponin levels, indicated myocardial damage, while an ECG revealed ST-segment elevation, characteristic of an anterior wall MI. Additionally, renal function tests showed elevated creatinine and urea levels, further substantiating the diagnosis of CKD.

Following the patient's death, the family was approached regarding the possibility of corneal donation. Consent was obtained after comprehensive counseling about the donation process, which included discussions on the ethical considerations and the impact of their decision. The surgical team coordinated with local health authorities to ensure that all protocols for organ donation were followed meticulously.

The harvesting procedure involved a well-organized effort among the surgical team and supporting staff. The team arrived with the necessary equipment and adhered to strict sterile techniques during the corneal harvesting. The corneal tissues were carefully excised and preserved in MK medium at a controlled temperature of 2-4°C to maintain their viability. This meticulous preservation was critical, as the corneas were intended for transplantation within a window of 14-20 days.

Results and Conclusions

The successful corneal harvest represented a landmark achievement, marking the first post-mortem corneal collection in the region. This case stands as a testament to the potential for organ donation to address the pressing need for corneal transplants, especially in a landscape where many individuals remain on waiting lists for sight-restoring procedures.

The decision by the patient’s family not only has the potential to restore vision for recipients but also serves as an inspirational story that can encourage other families to consider organ donation. By sharing this narrative within the community, healthcare professionals aim to foster a culture of donation that underscores the value of contributing to the well-being of others.

This case also highlights the necessity for ongoing public awareness campaigns to educate individuals about the benefits of organ and corneal donation. There are significant cultural and religious considerations that can influence attitudes toward donation. Engaging local leaders and communities through educational initiatives can help dispel myths and promote understanding, ultimately leading to increased donor registrations.

To support this initiative, the institution plans to implement several outreach programs aimed at educating the public about organ donation. These programs will include seminars, community workshops, and collaborations with religious and cultural organizations to address concerns and promote the altruistic nature of donation.

Additionally, efforts will be made to develop partnerships with local health authorities to streamline the donation process and improve logistics related to organ transport and preservation. By addressing these challenges head-on, the institution seeks to enhance its capability to conduct future corneal and organ transplants.

This pioneering case represents not just a significant milestone in eye care but also a crucial step toward building a robust organ donation framework in eastern Nepal. By fostering a culture of donation and actively engaging the community, healthcare professionals and institutions can work together to provide the gift of sight to many individuals in need, thereby transforming lives and enriching the community as a whole.

Discussion

The successful post-mortem corneal harvest at a teaching hospital in eastern Nepal represents a landmark achievement not only for the institution involved but also for the broader context of or-

gan donation and eye care in the region. This case highlights the potential for enhancing corneal transplantation services, especially in underserved areas where awareness and infrastructure for organ donation remain limited. The significance of this event lies in its implications for both individual patients awaiting corneal transplants and the overall advancement of eye care in Nepal.

Historically, the challenges associated with corneal transplantation in Nepal have been well documented. The first corneal transplants in the country were performed in the early 1990s, but the lack of a robust eye banking system has hampered progress [6]. Many regions, particularly rural areas, have insufficient resources to support timely harvesting and transportation of donated corneas, often resulting in missed opportunities for restoring sight. The case at hand demonstrates a critical step forward in establishing local capacity for corneal donation, aligning with the broader goal of improving access to eye care services.

The novelty of this case is underscored by the successful implementation of a coordinated approach involving multiple stakeholders, including healthcare professionals, the family of the deceased, and local health authorities. Previous reports have indicated that cultural resistance and lack of awareness are significant barriers to organ donation in Nepal [7]. However, this case exemplifies how community engagement and education can lead to a successful donation event, thereby setting a precedent for future cases.

Furthermore, the ethical considerations surrounding organ donation are pivotal in shaping public perception and acceptance. In many instances, families express reluctance to donate organs due to fears about the implications of donation on their loved one’s body [7]. The family’s decision to donate in this case reflects a shift toward understanding organ donation as an act of compassion and a means to help others, which aligns with the tenets of certain cultural beliefs, such as those held by the Jain community. This case serves as a reminder of the need to engage communities in discussions about organ donation, focusing on its ethical dimensions and the positive impact it can have on others’ lives.

Comparatively, other countries in the region, such as India and Sri Lanka, have made significant strides in establishing successful eye banking networks and organ donation programs. For instance, the Eye Bank Association of India has implemented a comprehensive framework for promoting corneal donation, resulting in a significant increase in donor registrations and successful transplants [10]. Similar strategies could be adapted and implemented in Nepal to enhance the current system.

Moreover, the introduction of digital platforms for awareness campaigns, as seen in several global initiatives, could further amplify the reach of educational efforts surrounding organ donation. The use of social media and mobile applications has proven effective in increasing awareness and donor registrations in various contexts, particularly among younger demographics [11]. Implementing such strategies in Nepal could help overcome cultural barriers and promote a more informed public discourse about organ donation.

The successful harvest and subsequent planned transplantation of the corneas within the prescribed time frame also exemplify effective logistical management in the organ donation process. Timely preservation of corneal tissues is critical for successful transplantation, as viability decreases over time. Reports have shown that corneal tissues are best used within 14-20 days post-harvest when preserved under optimal conditions⁸. This case reinforces the importance of establishing local eye banks capable of managing the logistics of corneal donation effectively, thus ensuring that tissues are utilized efficiently to benefit patients in need.

The case also draws attention to the need for comprehensive training and resources for healthcare professionals involved in the organ donation process. Developing specialized training programs focusing on the ethical, medical, and logistical aspects of organ donation can empower healthcare providers to engage with families and communities more effectively. Reports from other regions indicate that well-trained staff are crucial for addressing concerns and facilitating informed consent for organ donation [12]. Investing in such training will be vital for sustaining the momentum generated by this case.

In summary, the successful post-mortem corneal harvest in Eastern Nepal signifies a critical advancement in the field of eye care and organ donation. It highlights the potential for increasing community engagement and awareness, which are essential for overcoming the barriers that have historically hindered organ donation efforts in the region. By fostering a culture of compassion, education, and collaboration, healthcare professionals can encourage more families to consider organ donation, ultimately expanding access to corneal transplants.

Conclusions

The findings from this case not only contribute to the local landscape of organ donation but also provide valuable insights for similar initiatives in other developing countries. As Nepal continues to build on this momentum, it is crucial to adopt best practices from successful models worldwide, adapting them to fit the unique cul-

tural and social context of the country. This holistic approach will be essential for creating a sustainable framework that enhances the availability of corneal tissues and restores sight to countless individuals in need.

Author Contributions

- **Manuscript preparation:** Rahul Kumar Chaudhary, Sajjad Ahmed Khan.
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Conflict of Interest Statement

The authors have no conflict of interest to declare.

Data Availability Statement

Data will be provided by the corresponding author upon reasonable request. Images uploaded in the separate files.

Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal’s patient consent policy.

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