Mini Review
Volume 06:01, 2024

Journal of Surgical Pathology and Diagnosis

ISSN: 2684-4575 Open Access

Donor Characteristics in Graft Detachment after Posterior Lamellar Keratoplasty

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Abstract

Posterior Lamellar Keratoplasty (PLK), including Descemet's stripping automated endothelial Keratoplasty and Descemet's Membrane Endothelial Keratoplasty (DMEK), has revolutionized the treatment of corneal endothelial diseases. Despite its high success rates, graft detachment remains a significant complication, affecting visual outcomes and necessitating re-grafting in some cases. This article delves into the donor characteristics associated with graft detachment after PLK, exploring various factors such as donor age, endothelial cell density, graft preparation techniques, and surgical expertise. Understanding these factors is crucial for optimizing graft selection and surgical outcomes in PLK procedures. Posterior Lamellar Keratoplasty (PLK) has emerged as the standard of care for treating corneal endothelial disorders. While the technique offers numerous advantages over traditional penetrating keratoplasty, graft detachment remains a challenging complication that affects visual outcomes and graft survival. Graft detachment occurs due to various factors, including donor characteristics. This article aims to review the literature on donor characteristics influencing graft detachment after PLK, providing insights into optimizing donor selection and surgical techniques.

Keywords: Keratoplasty • Posterior • Surgical

Introduction

One of the key donor characteristics influencing graft detachment is donor age. Several studies have suggested a correlation between older donor age and increased graft detachment rates. Older donor corneas typically exhibit decreased Endothelial Cell Density (ECD) and altered endothelial cell morphology, predisposing them to graft detachment. However, conflicting evidence exists, with some studies reporting no significant association between donor age and graft detachment. Further research is warranted to elucidate the precise relationship between donor age and graft detachment risk [1]. Endothelial Cell Density (ECD) is a critical determinant of graft survival following PLK. Donor corneas with higher ECD are generally associated with lower rates of graft detachment. The endothelial cell layer plays a crucial role in maintaining corneal transparency and hydration, and a higher ECD provides better functional reserve against detachment forces. Thus, selecting donor corneas with adequate ECD is essential for minimizing the risk of graft detachment post-PLK.

Literature Review

The method of graft preparation can also impact graft detachment rates. Various techniques, such as DSAEK and DMEK, differ in their graft handling and preparation methods. Studies have shown that DMEK, which involves transplantation of the Descemet's membrane and endothelium alone, may have lower detachment rates compared to DSAEK, where additional stromal tissue is transplanted. The reduced manipulation and thickness of the DMEK graft may contribute to its lower detachment rates. However, proper surgical training and expertise are crucial for successful DMEK implementation. The surgical skill and experience of the operating ophthalmologist play a significant role in minimizing graft detachment rates. Studies have demonstrated a learning curve associated with PLK procedures, with higher detachment rates observed during the initial phase of surgeon experience. Adequate training and proficiency in graft manipulation, insertion, and positioning are essential for reducing the risk of graft detachment. Surgeons should strive for continuous improvement and adherence to standardized surgical protocols to optimize outcomes in PLK procedures [2-4].

Discussion

The viability of corneal grafts has also been examined in relation to cooling during the death to preservation window. Seemingly, benefactor refrigeration is essential to forestall early endothelial harm by decelerating cell digestion and following cell demise in a condition of cooling before protection. One examination of almost observed that refrigeration during this span was connected with fundamentally higher chances of reasonableness for transplantation, however how much time in refrigeration was not investigated. Others discovered that benefactor refrigeration gainfully affected ECD just when the passing to safeguarding time surpassed 12 hours. The motivation behind this study is to additionally analyze the impact of benefactor, beneficiary, and unite qualities, specifically giver age, diabetic and hypertensive history, beneficiary sex, history of earlier transfer, endothelial cell thickness passing to-cooling time (DTC), demise to-protection time and time-in-conservation on corneal transplantation results, including rebubble rates, regraft rates, and best remedied visual keenness improvement [5,6].

Conclusion

Graft detachment remains a significant challenge in posterior lamellar keratoplasty, affecting visual outcomes and graft survival. Donor characteristics, including age, endothelial cell density, graft preparation techniques, and surgical expertise, play crucial roles in determining the risk of graft detachment. Optimizing donor selection criteria and surgical techniques based on these factors can help minimize graft detachment rates and improve outcomes in PLK procedures. Further research is needed to elucidate the precise mechanisms underlying graft detachment and to develop strategies for its prevention and management. Overall, our research showed that cooling

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Received: 02 January, 2024, Manuscript No. jspd-24-130434; **Editor Assigned:** 04 January, 2024, PreQC No. P-130434; **Reviewed:** 14 February, 2024, QC No. Q-130434; **Revised:** 20 February, 2024, Manuscript No. R-130434; **Published:** 29 February, 2024, DOI: 10.37421/2684-4575.2024.6.179

was associated with early visual improvement, though this association was not statistically significant one year after surgery. Further examinations could survey results at longer stretches than one year and in a bigger companion.

Acknowledgement

None.

Conflict of Interest

None.

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How to cite this article: Sandra, Lisa. "Donor Characteristics in Graft Detachment after Posterior Lamellar Keratoplasty." *J Surg Path Diag* 6 (2024): 179.