



CORNEAL HYDROPS: CASE SERIES HIGHLIGHTING DIFFERENT TREATMENT STRATEGIES

Ophthalmology

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ABSTRACT

Corneal hydrops is a complication of keratoconus and other corneal ectatic disorders, characterized by sudden corneal edema due to breaks in Descemet's membrane. This condition leads to acute vision loss and discomfort, necessitating timely intervention. This case series presents five patients diagnosed with corneal hydrops, each treated using different therapeutic approaches: conservative management, intracameral gas injection, amniotic membrane transplantation (AMT), corneal cross-linking (CXL), and penetrating keratoplasty (PKP). The outcomes of these treatments varied, demonstrating the need for an individualized approach to management.

KEYWORDS

corneal hydrops, octafluoropropane (c3f8), DALK.

INTRODUCTION

Corneal hydrops occurs due to the rupture of Descemet's membrane, allowing an influx of aqueous humour into the stroma, leading to severe corneal edema. This condition is often associated with keratoconus, pellucid marginal degeneration, and other corneal ectasias [1]. Patients typically present with acute pain, photophobia, and a sudden decrease in visual acuity. Treatment strategies range from conservative therapy, which allows for spontaneous resolution, to surgical interventions aimed at expediting recovery and preventing complications [2]. This case series aims to provide a comparative analysis of five different management modalities and their outcomes.

Case Series

Case 1: Conservative Management

A 24-year-old male with advanced keratoconus presented with sudden corneal edema and discomfort. He was managed conservatively with topical hypertonic saline (5%), corticosteroids, and cycloplegic drops to control inflammation and pain. Over a period of 10 weeks, the edema gradually resolved, leading to residual scarring but partial visual recovery. His best-corrected visual acuity (BCVA) improved from hand motions to 20/200 [3].



Case 2: Intracameral Gas Injection

A 14-year-old female with corneal hydrops was treated with an intracameral injection of octafluoropropane (c3f8) gas. The gas bubble promoted Descemet's membrane reattachment, facilitating a faster resolution of stromal edema. Within six weeks, corneal clarity improved significantly, and her BCVA improved from 20/400 to 20/100 [4].



Case 3: Amniotic Membrane Transplantation (AMT)

A 30-year-old male with persistent corneal edema despite initial conservative therapy underwent AMT. The amniotic membrane provided anti-inflammatory and epithelial healing benefits. This led to

rapid epithelialization, reduced inflammation, and partial restoration of corneal transparency over four weeks. Post-treatment BCVA improved to 20/150 [5].

Case 4: Corneal Cross-Linking (CXL)

A 22-year-old female with early-stage hydrops underwent accelerated CXL to stabilize the cornea. The treatment involved riboflavin application followed by ultraviolet-A (UVA) irradiation to strengthen the corneal stroma. Edema decreased significantly, and keratometric stability was achieved over a three-month period, reducing further ectatic progression [6].

Case 5: Penetrating Keratoplasty (PKP)

A 35-year-old male with severe corneal hydrops and extensive scarring underwent PKP. A full-thickness corneal transplant was performed, and the graft remained clear postoperatively. His BCVA improved to 20/60 at six months, with stable corneal curvature and no signs of graft rejection [7].

DISCUSSION

The management of corneal hydrops should be tailored to the severity of the condition and the patient's individual needs. Conservative treatment is a viable option for mild cases, allowing spontaneous resolution over time, but often results in residual scarring. Intracameral gas injection accelerates recovery by promoting Descemet's membrane reattachment, reducing edema duration. AMT offers additional benefits by promoting epithelial healing and modulating inflammation, making it an effective choice in persistent hydrops cases [8].

CXL has shown promise in early hydrops cases by strengthening the corneal stroma, reducing the progression of ectasia, and stabilizing the cornea before significant scarring occurs. However, its role in acute hydrops remains controversial. PKP remains the definitive treatment for cases with severe corneal scarring and visual impairment, though it carries the risks of graft rejection, astigmatism, and the need for long-term postoperative care [9].

CONCLUSION

Corneal hydrops is a vision-threatening complication of keratoconus that requires prompt and individualized management. Each therapeutic modality presents distinct advantages, and selection should be based on disease severity, patient factors, and anticipated outcomes. Future studies with larger cohorts are necessary to establish standardized guidelines for the optimal management of corneal hydrops.

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