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Acute Corneal Hydrops Following Contusive Ocular Trauma by a Tree Branch in a Child: A Case Report

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Abstract **Case Report**

Introduction*:** Acute corneal hydrops, characterized by sudden corneal edema, is a rare but serious complication often associated with keratoconus. This article presents an exceptional case in a 7-year-old child, following contusive ocular trauma by a tree branch. The aim is to highlight the importance of accurate assessment, rapid diagnosis and appropriate management to reduce potentially devastating visual sequelae. ***Observation: The patient, with no previous history of trauma, suffered a trauma to the right eye. Examination revealed stromal corneal edema with epithelial bullae and folds in Descemet's membrane. Despite the absence of pre-existing keratoconus, acute corneal hydrops was diagnosed. ***Discussion***: The pathogenesis of this acute corneal hydrops, occurring without pre-existing keratoconus, raises intriguing questions. Contusive trauma led to rupture of Descemet's membrane, causing an influx of aqueous humor into the corneal stroma. Unlike keratoconus-related cases, this severe trauma directly compromised the integrity of Descemet's membrane, demonstrating the variability of pathogenesis. ***Conclusion***: This unique case highlights the rare occurrence of acute post-traumatic corneal hydrops in a child. It underscores the importance of prompt, multidisciplinary management, while encouraging further studies to better understand pathogenesis. Raising awareness of the risks of ocular trauma and promoting preventive measures are also crucial to preserving eye health, particularly in children.

Keywords: Acute corneal hydrops, corneal stroma, keratoconus, visual sequelae.

INTRODUCTION

In ophthalmology, acute corneal hydropsis is a rare but serious complication characterized by sudden, massive corneal edema caused by the rupture of Descemet's membrane. Corneal hydrops can also occur exceptionally following contusive ocular trauma, such as the one examined in this report, although they are often associated with keratoconus. Here, we present an exceptional case of acute corneal hydrops in a 7-year-old child who suffered ocular trauma caused by a tree branch. This unusual presentation highlights the importance of accurate assessment, rapid diagnosis, and appropriate management to reduce potentially devastating visual sequelae.

CASE REPORT

The patient was 7 years old, with no previous history of trauma to the right eye (RE) from a tree branch, according to his parents, prompting a visit to the ophthalmology emergency department. On examination, the patient presented with a painful red RE with visual acuity (VA) at 1/10th without correction, conjunctival hyperemia, and an area of stromal corneal edema with epithelial bullae and folds in the descemet membrane in the lower half of the cornea, 3mm in diameter. There were no perforations or abnormalities in the anterior chamber, iris, or lens. Au fond d'œil, le pôle posterior est bien visible et la retine plate appears without notable anomalies. Au level of the left eye (LE), visual acuity was to 10/10ème without correction and the rest of the examination proves without particularities.

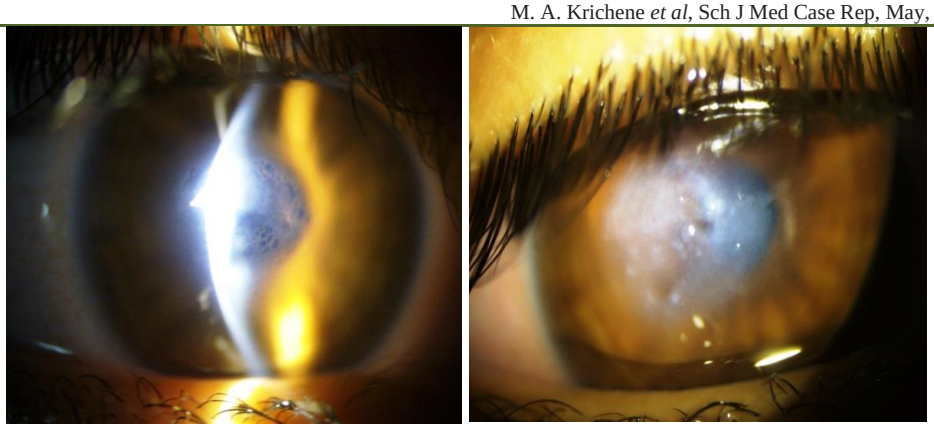

Figure 1: Central corneal opacity at the RE

An OCT of the cornea was performed, showing an increase in corneal thickness at the RE, more marked in the center, and fluid-filled intra-stromal lakes. On the LE, the OCT was without abnormalities.

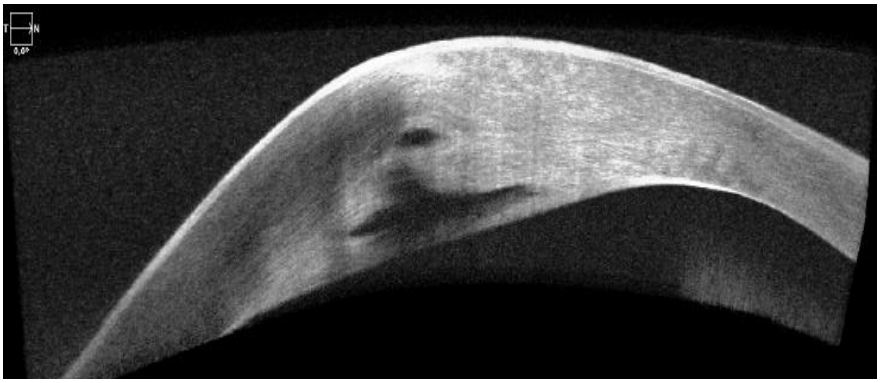

Figure 2: Corneal OCT showing central corneal thickening with intra-stromal lakes

The diagnosis of acute corneal hydrops was adopted, and medical treatment was started as a matter of urgency, including a hypertonic solution eye drop, a cycloplegic, artificial tears, an antiglaucoma agent (dorzolamide), a steroidal anti-inflammatory eye drop and local antibiotic therapy. A protective shell was prescribed to protect the affected eye.

Treatment lasted for 1 month (eye drops stopped on day 10), with regular follow-up every 48 hours for the first week, then every week for 3 weeks, and then every month for 6 months.

The evolution was marked by clinical and radiological improvement, with a clear improvement in visual acuity to 6/10 with an optical correction of -1.25 (-3.25 at 175°). The corneal edema resolved, leaving an axial stromal scar with a slight irregularity of the descmet membrane. When a gas-permeable rigid lens was prescribed, acuity improved to 8/10ths at RE.

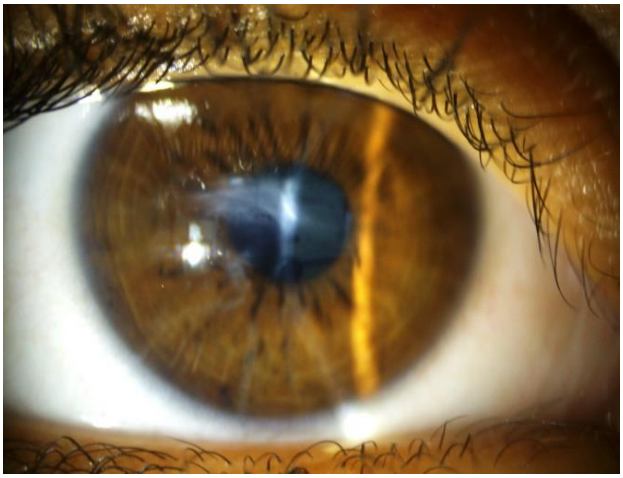

Figure 3: Clinical evolution after treatment

During follow-up, the possibility of keratoconus revealed by trauma was taken into consideration, leading to a corneal topography after improvement, which was normal at the LE and at the RE, showing central corneal atrophy due to corneal scarring.

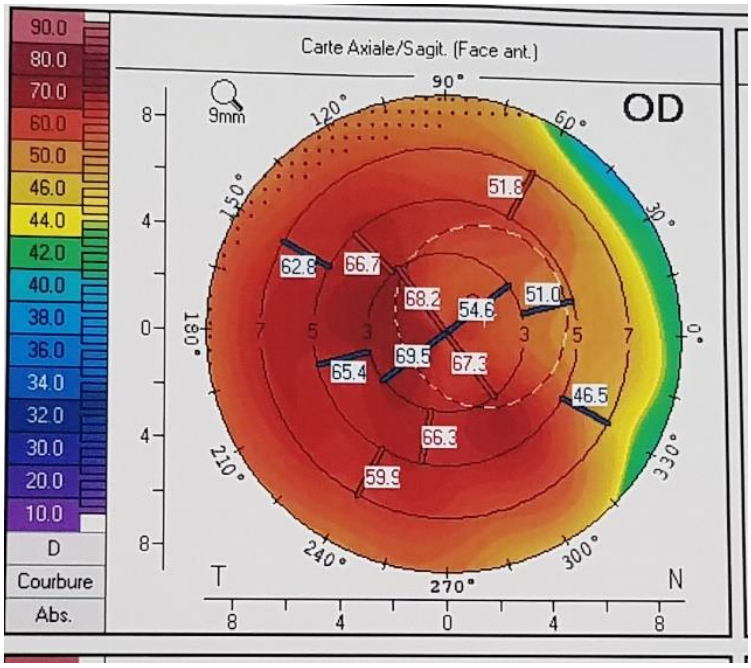

Figure 4: Corneal atrophy in corneal topography

DISCUSSION

Acute corneal hydropsis is a rare and serious complication of the cornea that is usually associated with keratoconus [1]. However, due to the absence of pre-existing signs of keratoconus, the clinical case presented here is exceptional. The underlying pathogenesis of corneal hydrops may occur independently of any pre-existing condition, raising intriguing questions.

Acute corneal hydrops is due to the tearing of Descmet's membrane, which causes edge rolling. A space is created so that aqueous humor from the anterior chamber seeps into the corneal stroma [2]. In our case, a sudden increase in intraocular pressure caused by the impact resulted in the rupture of Descemet's membrane and an influx of aqueous humor into the stroma, which probably caused the hydrops.

In contrast to cases described in the keratoconus literature where Descemet's membrane was thinned, this case demonstrates the extent to which severe ocular trauma can directly compromise the integrity of Descemet's membrane and thus promote immediate infiltration of aqueous humor into the corneal stroma. Indeed, the mechanical force applied during the trauma has not only damaged corneal structures but also caused epithelial bubbles and folds to form in Descemet's membrane.

Symptoms of acute corneal hydrops include a marked drop in visual acuity, intense photophobia, and pain [3], as in the case of our patient, who presents the same picture with an area of stromal corneal edema on examination, with epithelial bubbles and folds in Descemet's membrane in the lower half of the cornea. Corneal edema can be classified according to its extent: grade 1 within a circle of 3 mm in diameter, grade 2 between circles of 3 and 5 mm in diameter, and grade 3 beyond a circle of 5 mm in diameter [3, 4], which leads us to classify our case as grade 2.

The diagnosis of corneal hydrops is essentially based on the patient's history (keratoconus) and the results of the slit lamp examination. Examinations are required to determine the size and extent of the edema and Descmet's tear, enabling the treatment plan to be drawn up, the response to treatment to be monitored, and any complications to be identified.

Early diagnosis of corneal hydrops enables effective management [5], but this remains essentially supportive and is not definitive [6]. In this case, a full course of emergency medical treatment was administered, including a hypertonic eye drop to alleviate corneal edema, a cycloplegic to relieve pain and prevent iris spasm, artificial tears to maintain corneal moisture, an anti-glaucoma agent (dorzolamide) to reduce IOP, and a steroidal anti-inflammatory eye drop in addition, it was imperative to prescribe a protective shell to prevent further ocular trauma. One study showed that the use of a banded contact lens reduces corneal edema but increases corneal hypoxia, which delays the

corneal healing process and results in dense scarring [7]. In our case, the prescription of a gas-permeable rigid lens after treatment improved visual acuity to 8/10ths.

Various surgical treatment modalities have been mentioned in the literature to improve the corneal healing process. All the methods mentioned in the literature are equally effective, offering a favorable visual result and preventing the formation of corneal vascularization [8], but in our case we did not resort to surgical means given the clinical improvement, which leads us to further study this described type of acute hydrops and its therapeutic peculiarities as well as the need to proceed with surgical means, notably stromal sutures.

This unique clinical case convincingly demonstrates that acute corneal hydrops can occur without the prior existence of keratoconus, underscoring the variability of pathogenesis. This case is unique in that severe contusive ocular trauma caused Descemet's membrane to rupture. This observation highlights the importance of prompt, multidisciplinary management to reduce complications and maximize the chances of visual recover.

CONCLUSION

This unique case of acute post-traumatic corneal hydrops in a child presents fascinating prospects for future research. The originality of this presentation indicates that further studies are needed to better understand the pathogenesis and underlying mechanisms. Individual responses to different treatment protocols and evaluation of long-term outcomes will help optimize therapeutic strategies and improve the quality of care for patients suffering from this rare condition. In addition, it is crucial to raise awareness of the risks of ocular trauma and promote preventive measures to reduce the incidence of these important situations and preserve ocular health, particularly in children. Clinical problems such as those presented in this case.

REFERENCES

1. Gomes, J. A., Tan, D., Rapuano, C. J., Belin, M. W., Ambrósio Jr, R., Guell, J. L., ... & Sangwan, V. S. (2015). Global consensus on keratoconus and ectatic diseases. *Cornea*, *34*(4), 359-369.
2. Maharana, P. K., Sharma, N., & Vajpayee, R. B. (2013). Acute corneal hydrops in keratoconus. *Indian journal of ophthalmology*, *61*(8), 461-464. doi: 10.4103/0301-4738.116062. PMID: 23925338; PMCID: PMC3775088.
3. Tuft, S. J., Gregory, W. M., & Buckley, R. J. (1994). Acute corneal hydrops in keratoconus. *Ophthalmology*, *101*(10), 1738-1744.
4. Akova, Y. A., Dabil, H., Kavalcioglu, O., & Duman, S. (2000). Clinical features and keratoplasty results in keratoconus complicated by acute hydrops. *Ocular Immunology and Inflammation*, *8*(2), 101-109.
5. McMahon, T., Anderson, R. G., Joslin, C. E., Rosato, L., & Dartt, D. A. (2009). A novel minimally invasive technique to induce hydrops in the rabbit cornea. *Mol Vis*, 15, 1946-1952.
6. Basu, S., Vaddavalli, P. K., Ramappa, M., Shah, S., Murthy, S. I., & Sangwan, V. S. (2011). Intracameral perfluoropropane gas in the treatment of acute corneal hydrops. *Ophthalmology*, *118*(5), 934-939.
7. Carter, J. B., Jones, D. B., & Wilhelmus, K. R. (1989). Acute hydrops in pellucid marginal corneal degeneration. *American journal of ophthalmology*, *107*(2), 167-170.
8. Subudhi, P., Patro, S., & Rao Subudhi, N. (2020). Acute Hydrops and Its Management. IntechOpen. doi: 10.5772/intechopen.94592