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CASE REPORT: BILATERAL EYE BURNS WITH EXTRUSION OF UNILATERAL KERATOPROSTHESIS

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Abstract: Eye burns caused by alkaline agents are potentially serious for eye health and require an immediate professional approach, given the large number of cases that progress with significant worsening of visual acuity. Initial thorough washing with saline or running water is crucial. The importance of this procedure lies in several benefits for immediate eye health and the prevention of long-term damage. In cases of severe eye burns, which irreversibly compromise the cornea, keratoprosthesis emerges as a therapeutic option. Keratoprosthesis represents hope for patients with severe eye burns, providing an effective solution to improve vision and quality of life. The complexity of the procedure varies according to each individual's clinical case, but with technological and scientific advances, there are increasingly more options and methodologies for carrying out a safe and effective procedure.
Keywords: Eye burn, Ophthalmological trauma, Keratoprosthesis

INTRODUCTION

Ophthalmological trauma due to exposure to chemical substances, such as caustic alkalis, represents a serious and potentially devastating condition for ocular health. Among these aggressive agents, contact with lime (calcium hydroxide) is of particular concern due to its high corrosive capacity. Eye trauma caused by lime can occur in various situations, such as industrial and domestic accidents or during inappropriate handling of materials containing this substance.

This form of eye injury demands immediate attention and a specialized approach, as it can result in extensive damage to the cornea, conjunctiva and adjacent ocular structures, often permanently compromising vision.

In this context, the use of keratoprosthesis, introduced by Claes Dohlman, has become an option for cases of corneal blindness, especially in cases where ophthalmic alkaline burns occur and in patients who presented a high percentage of corneal transplant rejection.

The objective of this study is to report the case of an ophthalmic patient with severe bilateral alkaline ocular burns who underwent corneal transplantation in the right eye in 2005, which developed rejection. In 2014, he underwent surgery to place a keratoprosthesis in his right eye, which also resulted in rejection due to infection.

METHODOLOGY

Information obtained through medical record review in 2023, patient assessment, photographic records and literature review. Study carried out with informed consent, patient anonymity, confidentiality and patient privacy.

This is a descriptive observational study, carried out at a University Hospital in Curitiba.

Figure 1: Biomicroscopic examination of the right eye
Source: photograph provided by the author

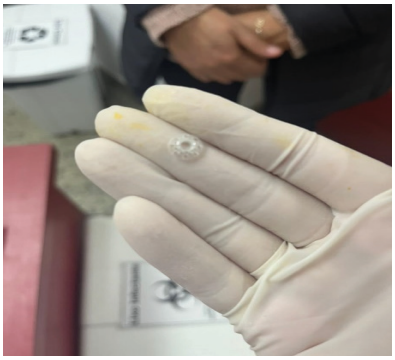

Figure 2: Extruded keratoprosthesis brought by the patient
Source: photograph provided by the author

CASE REPORT

A 37-year-old white male patient reports that in 2005 he had severe bilateral eye burns caused by lime. He reports that at the time he underwent a corneal transplant in his right eye, which resulted in rejection. In 2014, he underwent another surgery to place a keratoprosthesis in his right eye. In 2023, he reported hyperemia, pain and purulent secretion in the right eye. He said he consulted a health service where treatment with eye drops was prescribed (Tobramycin 6/6 hours and ocular lubricant 4/4 hours). After a week, he progressed to expulsion of the keratoprosthesis (figure 1), leading to admission to the ophthalmology emergency room of a University Hospital. In the ophthalmological examination, he presented visual acuity of light perception in both eyes and, in the biomicroscopic evaluation (figure 2), the presence of pus in the lower tarsus, intense conjunctival hyperemia and an inflammatory membrane in the anterior segment of the right eye with anatomical disorganization of the anterior chamber.

In his left eye he had 360-degree pannus without infectious signs. It was recommended to continue using the eye drops already prescribed and start treatment with Moxifloxacin Hydrochloride orally (PO) 400 mg every 12 hours until further notice. They were also advised to return to the outpatient clinic the following day to perform an urgent ultrasound and discuss the best therapeutic approach.

At the outpatient clinic, an ultrasound scan was performed on the right eye, which showed an increase in the thickness of the posterior sclera, a decrease in the anteroposterior diameter, vitreous echoes with low reflectivity, retina and choroid in position. It was decided to maintain Moxifloxacin 400 mg PO every 12 hours until further notice. Moxifloxacin 5.45 mg/ml eye drops every 2 hours was prescribed in the right eye and was advised to return the following day to the cornea clinic to evaluate the indication for conjunctival coverage or evisceration in the right eye.

The patient returns to the cornea clinic using the prescribed medications correctly and reports mild eye pain on the right and a decrease in the size of the eyeball on the right. It was advised to suspend oral antibiotic therapy and continue using Moxifloxacin 5.45 mg/ml every 2 hours in the right eye. Regressive Prednisone 40 mg orally was prescribed and urgent conjunctival coverage with amniotic membrane was indicated in the right eye. After covering, the pain improved and the infection resolved, maintaining visual acuity of light perception in both eyes.

THEORETICAL FOUNDATION

Chemical eye burns are caused by two groups: alkalis and acids. Alkalies are substances with a basic pH (less than 7) that cause greater damage to the eye. This type of product, unlike acids, can cross the ocular surface and also cause damage to the intraocular structures (cornea, aqueous humor, lens and vitreous) as they are capable of causing a reaction in the tissues (saponification), in which the presence of the hydroxide anion causes a structural change in cell membranes, generating necrosis (CASTELLANO, AGD et al.). This mechanism of trauma can result, in most cases, in the functional reduction of the eye, generating a loss of vision unilaterally or bilaterally, with the majority of accidents involving chemical substances occurring in the work environment with the substance "lime", reaching mostly male individuals. According to the Hughes classification, the degree of injury takes into consideration, the appearance of the cornea and limbal ischemia; The degrees of the burn can vary from I to IV, with increasing damage caused. Considered an emergency, this type

of trauma must be treated by a healthcare professional in a hospital and must follow the steps of abundant washing with water, medical evaluation, topical medication, additional exams (biomicroscopy, tonometry) and, sometimes, surgery. If vision is affected, a visual rehabilitation program will be necessary to help the patient adapt (NOIA, L. DA C.; ARAÚJO, AHG DE.; MORAES, NSB DE.).

A keratoprosthesis, also known as a corneal prosthesis, is a medical device used to replace or repair the cornea of the eye when it is damaged, opaque or non-functional. Keratoprostheses are designed to restore transparency and visual function to the affected eye. There are several types of keratoprostheses, and the choice of model depends on the patient's specific conditions. Some of the main categories include: Boston Keratoprosthesis, which uses a sclera structure made of acrylic, combined with an artificial cornea also made of acrylic or polymethylmethacrylate (PMMA), showing effectiveness in 90% of cases for non-immunological diseases; Osteo-Odonto-Keratoprosthesis (OOKP): involves the use of a patient's own tooth, which is extracted and implanted in the eye socket, is generally reserved for extreme cases in which other treatment options, such as conventional corneal transplantation, are not possible due to the severity of the injury or the lack of suitable tissue for transplantation; Alphacor keratoprosthesis, which is similar to a hydrophilic contact lens. The choice of the keratoprosthesis model depends on the patient's specific clinical conditions, such as the extent of the corneal lesion, the presence of associated ocular diseases and the availability of suitable autologous tissue for the construction of the prosthesis. (KWITKO, S.; STOLZ, A. P)

CONCLUSION

The reported case highlights the drama of the evolution of severe eye burns and the importance of a quick and effective first approach by the emergency medical team, identifying the agent causing the burn and carrying out copious eye washes first.

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