Short communication

Sterile non-traumatic corneal perforation treated with Tachosil®

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ABSTRACT

Case report: An 83-year-old male reported to the emergency room with red eye and ocular pain. The slit-lamp examination showed a central corneal perforation of 1 mm in diameter, with no associated infection or inflammatory process. The patient had no history of trauma. It was decided to apply a patch of Tachosil® at the site of corneal perforation. After 36 h of occlusion, a layer of fibrin covered the perforation, closing the defect. Successful healing of the corneal perforation was observed in the follow-up, with no recurrences of the process. Conclusions: Tachosil® is collagen sponge with human fibrin and human thrombin used in cardioand neurological surgery for haemostasis and the occlusion of vessels and meninges. We present the first indication in ophthalmology of Tachosil® as an effective alternative in the treatment of sterile non-traumatic corneal perforations less than 1.5 mm in size.

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Perforación corneal no traumática estéril tratada con Tachosil®

RESUMEN

Caso clínico: Varón de 83 años que acude a urgencias por dolor ocular en ojo derecho y enrojecimiento. En la exploración se objetivó una lesión perforante corneal central de 1 mm de diámetro sin proceso infeccioso o inflamatorio concomitante ni antecedentes traumáticos. Procedimos al cierre urgente del defecto, aplicando un parche de Tachosil® sobre la zona perforada. Tras 36 horas de oclusión un material fibrinógeno oculta la perforación cerrando el defecto. En el posterior seguimiento no se presentaron recurrencias ni efectos adversos persistiendo el sellado completo del defecto.

Conclusiones: Tachosil® es una esponja colágena de fibrinógeno y trombina humanos utilizada para favorecer la hemostasia y la reparación tisular en cirugías cardiacas, urológicas...

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Introduction

Non-traumatic ocular perforations are a part of an infrequent and difficult to treat condition, the early identification of which and fast action will assist in preserving useful visual acuity.1

This paper presents the first ophthalmological use of the Tachosil® human fibrinogen and thrombin collagen sponge as a possible effective alternative for sterile nontraumatic corneal perforations smaller than 1.5 mm.

Clinical case

Male, 83, with advanced Alzheimer’s disease, insulin-dependent diabetic with 35 years evolution visited our emergency service due to ocular pain in right eye with 2 days of evolution.

Visual acuity (VA) could not be determined due to lack of cooperation. The anterior segment assessment determined a corneal ulceration injury with a diameter of 2.5 mm and a central perforating endothelial pore of approximately 1 mm, without associated infections or inflammatory process. The patient did not exhibit traumatic history.

With sterile nontraumatic corneal perforation diagnostic to be finalized, we proceeded to an urgent closure of the injury.

Under topical anesthesia and in the operating theater to facilitate cooperation, a Tachosil® patch was prepared, sized to exceed the edges of the ulcer in order to achieve complete cover. After hydrating with saline solution for 5 s, the active (yellow) part was applied immediately over the corneal defects, exerting soft pressure with tweezers to adapt the sponge during 5 min (Fig. 1) to make sure that it firmly joined the injury (Fig. 2).

Without withdrawing the excess material, the eye was occluded for 36 h. When the occlusion was removed, we observed that there were no remains of the sponge in the application area, although a fibrinoid material remained occluding the perforating endothelial pore (Fig. 3). No remains of displaced sponge were found, not even in the conjunctival sac. For safety purposes, a therapeutic lens was applied and antibiotic topical treatment was established with

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Fig. 1 – Application of the patch after saline solution hydration. As shown, the sponge was softly pressed and molded with tweezers for 3 min to verify its adhesion to the treatment area.

Fig. 2 – The material immediately before occluding the eye. As shown, the sponge retracted and hardened, reducing its size. The excess sponge was not withdrawn.

Fig. 3 – Slit lamp image after withdrawing the occlusion 36 h after application. No remains of the sponge can be seen on the perforated area, which instead exhibits fibrinoid material which occluded the perforating pore.
cycloplegic and medroxyprogesterone. Seventy-two hours after the application (Fig. 4), corneal thinning persisted on the perforation area with total closure and good anterior chamber depth. Subsequent assessments one week and one month confirmed the overall corneal closure, whereupon the therapeutic lens and the aforementioned medical treatment were withdrawn.

Discussion

The etiology of nontraumatic corneal perforations could be divided into groups: sterile and infectious. By way of example of the first group, there are series describing dry eye keratopathies as the first cause1 together with others such as herperetic neurotrophic keratopathies or perforations due to exposure.1,2 In the case of infectious perforations, the most prevalent are bacterial and fungal.3

In our patients, subsequent ophthalmological assessment determined signs of bilateral advanced dry keratopathy, and treated after said condition. Assessments for inflammatory systemic diseases were negative.

As regards treatment, there are several alternatives. Therapeutic lenses, fibrin or cyanoacrylate adhesives, conjunctival flaps, lamellar or penetrating keratoplasty and recently the use of multilayer amniotic membrane are the most frequently applied procedures.2,3 The variable effectiveness described for cyanoacrylate4 and the good results of taint with multilayer amniotic membrane are worthy of note.2

Cyanoacrylate continues to be the most widely used treatment for smaller diameter perforations.3 Precisely in this type of perforations is where we believe that Tachosil® can prove to be most effective. Prior to its application, we were aware of the good results obtained by Hurtado-Sarrión M et al. with Tachosil® in a post-infectious nontraumatic corneal perforation.4 The described tolerability and perfect evolution drew our attention and, considering that finding cyanoacrylate in our case would involve delays in the emergency treatment because it was not readily available as well as the experience of operating theater staff in preparing Tachosil®, made us decide to apply it without excluding the possibility of subsequent supplementary treatment in case this approach failed. However, the follow-up proved that of itself the sponge closed the defect without any relapses or adverse effects.

Tachosil® is a collagen sponge covered with coagulation factors, fibrinogen and human thrombin which, upon making contact with blood or physiological fluids, produces hemostasia and creates a fibrin layout which seals and provides a matrix with adhesive and sustaining properties. Its effectiveness is broadly demonstrated in other fields such as cardiology, urology or neurosurgery.5 This case constitutes the first ophthalmological use of Tachosil® for sterile nontraumatic perforation described to date.

There is very little experience with this type of sponge in ophtalmology but we believe that it can provide a number of advantages such as application in slit lamp or not requiring therapeutic contact lens in the postop.4 The instant case provides a new possible indication and reinforces the notion of its possible use in ophthalmology.

REFERENCES